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Competencies and Characteristics for Teaching Gifted Students: A Comparative Study of Beijing and Hong Kong Teachers

Hoi Yan Cheung[1] and Sammy King Fai Hui[2]

Abstract

This study examines the competencies and characteristics of in-service teachers who teach gifted students. A total of 511 in-service teachers participated in the study, 334 of whom were from Beijing and 177 were from Hong Kong. The scale developed by D. W. Chan was used as the instrument to examine the competencies and characteristics of the teachers. The Beijing in-service teachers gave significantly higher self-ratings for their characteristics and competencies than the Hong Kong in-service teachers. Beijing in-service teachers who taught in schools for the gifted (supernormal schools) gave the highest ratings for all the variables. This study analyzed the reasons behind why teachers in each city would have such ratings on competencies and characteristics for themselves, and why Beijing teachers (especially those who taught in supernormal schools) would have significantly higher ratings than their Hong Kong counterparts.

Keywords

teachers of gifted students, competencies, characteristics, Beijing, Hong Kong

The study of teacher competency has progressed from the investigation of teachers in regular classroom situations to include teachers of students with special needs in inclusive educational settings, where teaching can be more challenging. Students with special needs, such as gifted students, require specific attention from school and teachers. To fully develop the potential of gifted students in an inclusive education setting requires a special curriculum, an optimal learning environment, and competent teachers who feel confident to meet the needs of these students. Teachers have a significant influence on the curriculum, the learning environment, and many other aspects of education (Gross, 2002, 2003). It is therefore believed that if teachers possess the necessary competencies to implement programs for the gifted, then the success rate of such programs will be higher. Generally, the success of programs for the gifted students depends very much on the support from teachers who possess a high level of the necessary competencies (Hansen & Feldhusen, 1994). The following section presents some important studies in the area of teachers' competencies regarding gifted students.

Competencies of Teachers of Gifted Students

Seeley (1979) identified the competencies required by teachers of gifted students to be skills in individualized teaching, knowledge of the nature and needs of gifted students, and the ability to identify gifted and talented students. Short (1985) also identified competency as including several dimensions such as behavior, capacity, and the quality of a person. Nelson and Prindle (1992) conducted a survey and identified six basic competencies for teachers of the gifted that were agreed on by both teachers and principals: promotion of thinking skills, development of creative problem solving, selection of appropriate methods and materials, knowledge of affective needs, facilitation of independent research, and awareness of the nature of gifted students. Feldhusen (1997) investigated the competencies of successful teachers of gifted students based on several past studies (Hultgren & Seeley, 1982; Nelson & Prindle, 1992; Silverman, 1982; Starko & Schack, 1989; Story, 1985) and came to the conclusion that the most important qualities were skills in teaching, thinking, problem solving and creativity, interaction with students, appropriate motivational techniques, the conducting of student-directed activities, and the facilitation of independent research. Besides possessing the necessary competencies, teachers must also

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have certain characteristics for teaching gifted students (D. W. Chan, 2001; Lindsey, 1980; Story, 1985; Whitlock & DuCette, 1989). The following section discusses the studies on teachers' characteristics.

Characteristics of Teachers of Gifted Students

In the 1960s, Bishop (1968) concluded that successful teachers of gifted students have several characteristics particular to them, including a high level of intelligence, maturity, and experience, and the will to strive for high levels of achievement. Maker (1975) identified several significant traits of successful teachers of gifted students—namely, the ability to relate to gifted students, imagination, and respect for individual talent. In the 1980s, Hultgren and Seeley (1982) proposed 12 characteristics of effective teachers of the gifted and talented, stating that they should (a) be mature, experienced, and self-confident; (b) be highly intelligent; (c) have intellectual interests; (d) be achievement oriented; (e) hold favorable attitudes toward the gifted; (f) be systematic and orderly; (g) be stimulating and imaginative; (h) have a good sense of humor; (i) facilitate learning without directing; (j) be hard working; (k) have broad general knowledge and expertise; and (l) recognize individual differences. In Whitlock and DuCette's (1989) competency model, the qualities of outstanding teachers of gifted students include enthusiasm, empathy, and openness.

Based on observation, Feldhusen (1997) suggested the desirable characteristics of teachers of gifted students to be intelligence, an achievement orientation, and a knowledgeable and flexible attitude. Many recent empirical studies have focused on the appropriate characteristics that teachers need to implement inclusive education, such as commitment, the ability to support and establish a rapport with students, and a positive attitude (Dupoux, Wolman, & Estrada, 2005; Isenbarger & Zembylas, 2006; Maroney, Finson, Beaver, & Jensen, 2003).

The above studies on competencies and characteristics of teachers of gifted students were based in Western cultures, and the studies that were based in eastern cultures are limited. The section below looks into a significant study by D. W. Chan (2001) that focused on characteristics and competencies of Chinese teachers of gifted students.

Characteristics and Competencies of Chinese Teachers of Gifted Students

There are studies that focused on the gifted education in Hong Kong (Phillipson & Chik, 2009; Phillipson & Lin, 2005), but the research on the characteristics and competencies of Chinese teachers of gifted students is limited. D. W. Chan (2001) made a significant contribution by investigating the necessary characteristics and competencies that Chinese teachers of gifted students should possess, based on Western studies. Using the desirable characteristics and competencies identified by Feldhusen (1997), D. W. Chan (2001) compiled a checklist of 21 characteristics and 12 competencies for teachers of the gifted. In D. W. Chan's study, 50 Hong Kong teachers who had no training in education for the gifted rated and judged the characteristics and competencies that they perceived to be important for teachers of gifted students. The 21 characteristics were then extracted into three factors, each of which consisted of seven items. The three factors are "philosophical ideals," "professional predisposition," and "personal attributes." "Philosophical ideals" are characterized by educational values and ideals, including respect, responsibility, flexibility, empathy, and the consideration of individual differences. "Professional predisposition" can also be considered as the management qualities that are desirable in the teaching profession. "Personal attributes" can be described as having cultural and intellectual interests, and being innovative, highly intelligent, knowledgeable, and achieving.

The 12 competency items were extracted into the "specific skills" and "global strategies" factors, each of which contains six items. "Specific skills" are associated with teaching creativity and problem solving, identification, questioning, and meeting the needs of students, whereas "global strategies" are skills and competencies associated with general philosophical principles and methods, group processes, research, career, and attitude toward multiculturalism. By following D. W. Chan's study, Cheung and Phillipson (2008) asked Hong Kong teachers who taught gifted students to rate themselves on their own competencies and characteristics.

Purpose of the Study

This study aims to better understand the competencies and characteristics of teachers of gifted students in Beijing and Hong Kong. These two cities were selected for comparison because Beijing has the longest history in education for the gifted in China, whereas Hong Kong's education for the gifted provision is in its initial stages. It will be important and interesting to determine the differences in the factors relating to the development of education for the gifted in the two cities (the two sections below introduce the education system on giftedness of Beijing and Hong Kong). In particular, the present study could help Hong Kong understand how to improve its education for the gifted. Before the comparison study could be carried out, it was necessary to determine whether the Chinese version of the characteristics and competencies scale is suitable for use among in-service teachers from the two cities.

Education for the Gifted in Beijing

There are several schools for the gifted in Beijing that are known as supernormal schools. These schools identify highly

intellectual students at an early age and educate them in self-contained classes or schools. In supernormal schools, four components are deemed essential to bring forth the talent and potential of gifted students: the integration of exceptional intelligence (which refers to the interconnectedness of different abilities and behavior), the provision of accelerated learning experiences, the application of appropriate learning styles, and the encouragement of a positive attitude. The supernormal schools have multidimensional screening stages for selecting students and have unique curricula comprehensively designed to include continuous instructional adaptation, diverse learning opportunities, and innovations specific to each program. Teachers at supernormal schools, whether novice or experienced, must have excellent teaching records.

In 1978, the Chinese government developed a national framework for education for the gifted based on scientific studies of gifted children and put in place rules stipulating that students must go through a number of procedures before being formally recognized as being "supernormal" (Phillipson & Cheung, 2007). Beijing has a long history of educating gifted students, and the Beijing-based Cooperation Research Group of Supernormal Children of China has carried out numerous studies of gifted children to identify those who are intellectually gifted and to determine how to educate them in a way that promotes and accelerates their potential.

Education for the Gifted in Hong Kong

The Hong Kong Education Bureau states that one of its missions for gifted education is to develop the potential of gifted students to their full extent (Education Bureau, 2007). In Hong Kong, gifted students are divided into intellectually, academically, and creatively gifted groups. There are three operational modes of education for gifted students: whole-class and pull-out, both of which are school based, and off-site support.

In recent years, the Hong Kong government has initiated various programs to support school-based education for the gifted. For example, the Seed Project, which is based on the concept of inclusive education, began in the academic year 2002-2003 with the purpose of promoting school-based gifted curriculum at various schools and at various levels. The project aims to support participating schools for their gifted curriculum and intensify the gifted curriculum to fit the learning needs of gifted students (Education Bureau, 2007). The Seed Project also offers a wide variety of programs to teachers from participating schools to help them discover and develop the interests and potential of gifted students using a range of strategies (Education Bureau, 2007). Teachers who participate in these programs are selected by their school principals and are mostly teachers who have contact with gifted students or are responsible for the implementation of education for the gifted in their schools. Schools joining the Seed Project also receive outside support that includes an analysis of the current school situation, consultation services from experts, training sessions for teachers, and assessments of school-based programs, teachers, and development of education for the gifted in the school.

Method

The following subsections report the methodology used for this study, including the background of the teacher participants and the scales that were applied.

Participants

A total of 511 in-service teachers from Beijing and Hong Kong participated in the study. In total, 134 of the participants in Beijing were men and 200 were women. The average age of this sample group was 38.3 years, and their average length of teaching experience was 16.1 years. Among this group of Beijing in-service teachers, 97 taught at supernormal schools (29.0%), 80 taught at key public schools (24.0%), 81 taught at *minban* (private) schools (24.3%), and 76 taught at ordinary public schools (22.8%). The average amount of time spent by teachers at the supernormal schools teaching gifted students was 10.5 years.

As previously explained, supernormal school is merely another name for gifted school in Beijing. According to Cheung (2003), key schools are located throughout China. They are considered to be the elite government schools that allow only high-achieving students to enter by a selection process based on very competitive examinations and academic records. *Minban* schools are private schools or "people-run" schools. They usually require higher school fees than government schools and provide more resources for students. Ordinary public schools are owned by the government, and students enter these schools based on the location of their homes.

In Hong Kong, 177 in-service teachers participated in the study, of whom 52 were men, 117 were women, and 8 did not indicate their gender. The average age of the sample group was 31.5 years; the average length of their teaching experience was 8.6 years. Ten of the participants taught at government schools (6.2%), 132 taught at aided schools (81.5%), 20 taught at private schools (12.3%), and none taught at direct subsidy schools. According to P. G. Chan (2008), direct subsidy schools are nongovernment schools that receive subsidies from the government to help improve private school education. Though receiving financial aid from the government, direct subsidy schools can still decide their own curriculum, school fees, and entrance requirements. Aided schools are fully supported by the government, but are managed by non-profit-making sponsoring bodies. Private schools are non-profit-making schools that do not receive any recurrent subsidies from the government except reimbursement of rates, whereas government schools are totally owned and managed by the government.

Table 1. Information of Schools and Participants of the Study

	Beijing	Hong Kong
Gender	Male = 134 (40.1%) Female = 200 (59.9%)	Male = 52 (30.8%) Female = 117 (69.2%) Missing = 8
Mean for age (*SD*)	38.3 years (16.6)	31.5 years (8.5)
Mean for length of teaching experience (*SD*)	16.1 years (9.5)	8.6 years (6.6)
Mean for year of teaching gifted students (*SD*)	In supernormal schools 10.5 (6.5)	In the Seed Project 3.8 (3.25)
Participated in Seed Project		Yes = 102 (57.6%) No = 75 (42.4%)
Types of school	Supernormal school = 97 (29.0%) Public key school = 80 (24.0%) *Minban* key school = 81 (24.3%) Public ordinary school = 76 (22.8%)	Government school = 10 (6.2%) Aided school = 132 (81.5%) Private school = 20 (12.3%) Missing data = 15
Highest education level	Secondary level = 36 (10.8%) Bachelor's degree (3 years) = 220 (65.9%) Bachelor's degree (4 years) = 62 (18.6%) Master's degree = 16 (4.8%)	Secondary level = 1 (0.6%) Diploma = 29 (17.6%) Bachelor's degree = 110 (66.7%) Master's degree = 25 (15.2%) Missing data = 12

There were 102 teachers coming from schools that participated in the Seed Project, and these teachers had undergone training by the Hong Kong government in teaching gifted students. Seventy-five of the in-service teachers were from schools that were not participating in the Seed Project. The average time spent teaching gifted students among the in-service teachers from the schools that were involved in the Seed Project was 3.8 years. Both Beijing and Hong Kong teachers were divided into two groups: those who had experience in teaching gifted students and those who had no experience in teaching gifted students. Teachers who had experience were the ones who had taught gifted students in school before, and they were asked to indicate how many years of experience they had teaching gifted students; thus, those teachers would have indicated teaching years higher than zero. For teachers who had no experience, their teaching years for gifted students would be zero. Detailed information on the participants is presented in Table 1.

The next section focuses on the instrument that was applied in the study. As mentioned earlier, the characteristics and competencies scale developed by D. W. Chan (2001) was used as the instrument in this study.

Instrument

This study asked participants to rate their performance on the items from D. W. Chan's (2001) characteristics and competencies scale, rather than asking them to rate the importance of the characteristics and competencies for teachers who teach gifted students in general. The teachers were asked to rate themselves based on a 5-point scale (1 = *do not possess* and 5 = *totally possess*). The goal of the study was to find out how teachers view themselves in terms of their competencies and characteristics in teaching gifted students, which is similar to studies that ask participants to rate their self-confidence and efficacy. As D. W. Chan's (2001) scale is in English, the 33 items were translated and back-translated into Chinese for this study. Simplified Chinese script was used in Beijing, and traditional Chinese script was used in Hong Kong, because the Beijing participants might not have been able to understand traditional Chinese characters, whereas the Hong Kong participants were likely to be more comfortable reading traditional Chinese characters. However, the wording in the two versions was exactly the same for ease of comparison. The participants were also asked about gender, age, highest educational level, length of teaching experience, number of years spent in teaching gifted students, and the teaching levels and types of schools in which they taught.

Results

The following sections present the results generated by the data collected from Beijing and Hong Kong. Reliability and factor structure of the Chinese version of the characteristics and competencies scale were first reported. Then, correlations, comparison of means, and multiple discriminate analyses were used to compare the results obtained from the teacher ratings.

Reliability Analysis and Confirmatory Factor Analysis

Reliability analyses of the five characteristics and competencies factors were conducted for each of the locations, and the factors were found to be internally consistent (Cronbach's αs ranging from .65 to .90). Table 2 shows these results. To determine whether the scale was suitable for use among in-service teachers from the two cities, both separate and

Table 2. Cronbach's Alphas of the Five Characteristics and Competencies Factors

Factors	Beijing	Hong Kong
Philosophical ideas	.86	.83
Professional predispositions	.85	.82
Personal attributes	.65	.80
Specific skills	.89	.88
Global strategies	.89	.90

combined sample structures of the three-factor characteristics model and the two-factor competencies model were further tested using confirmatory factor analysis (CFA). The measures of fit in Amos suggested the structures to be a good fit. These measures included a low chi-square to *df* ratio, acceptable comparative fit indices, and a small value of root mean square error of approximation (RMSEA) with a large probability in testing the null hypothesis that the RMSEA would be no greater than 0.05. All these measures indicated that the factor structures accounted for the observed covariances in the data well, and would accurately reproduce the sample correlational data (see Table 3).

Correlations

Pearson product–moment correlations were used to measure the degree of association between the factors and other important variables, such as length of teaching experience and years of teaching gifted students, for each of the samples. The results are presented in Table 4. The patterns were similar between the Hong Kong and Beijing teachers, with both being highly correlated. The correlations among the five factors were considered "moderate" ($10\% < r^2 < 40\%$) to "strong" ($40\% < r^2 < 70\%$), and their correlations with average length of teaching experience and average years spent teaching gifted students were considered "weak" ($r^2 < 10\%$) to "moderate" ($10\% < r^2 < 40\%$).

Comparison of Means

Table 5 shows that the Beijing in-service teachers rated themselves more highly in all the characteristics and competencies factors than the Hong Kong in-service teachers. The inflated Type I errors of the effects were controlled by adjusting the *p* values using the Bonferroni method, and the differences were considered to be important, as the Cohen's *d* effect sizes were medium (>0.5; Cohen, 1988).

As an almost equal number of in-service teachers from the four types of schools (supernormal, public key, *minban*, and public ordinary schools) in Beijing participated in the study, the differences in means of the characteristics and competencies factors among these groups were calculated. Table 6 shows that the in-service teachers who taught in supernormal schools rated themselves significantly higher in all five characteristics and competencies factors than the teachers who taught in the other three types of schools. The differences among the means were supported by post hoc range tests and multiple comparisons (Tukey's HSD [honestly significant difference], Duncan, and Bonferroni).

Among the in-service teachers in Hong Kong, teachers from the schools that were participating in the Seed Project rated themselves significantly higher in two out of the five characteristics and competencies factors—"professional predispositions" and "specific skills"—than did teachers from schools that were not participating in the Seed Project. However, teachers who taught in private schools rated themselves significantly higher in all five factors except one ("global strategies") than did teachers who taught in government schools. Furthermore, interaction ($p = .06$) indicated that teachers who taught in private schools and who were not participating in the Seed Project rated themselves higher than teachers in all the other five groups. Table 7 shows the results. It is important to note that the number of teachers from government and private schools in the sample was much lower than the number of teachers from aided schools.

Multiple Discriminant Analysis

Multiple discriminant analysis (MDA) was used to determine the variables distinguishing the two sample groups (Hong Kong and Beijing teachers). MDA was chosen for its ability to accommodate the categorical dependent variable (the two locations) and its better classification accuracy for the small subsample groups in the study. The independent variables used were the five characteristics and competencies factors, length of teaching experience, years of teaching gifted students, and highest education level. The analysis involved entering the variables in a stepwise procedure (using an *F*-to-enter of 3.84 and an *F*-to-remove of 2.71) based on their explanatory potential. Five significant discriminating variables were produced—namely, "personal attributes," "global strategies," "length of teaching experience," "years of teaching gifted students," and "highest education level." All five variables showed significant univariate differences between the two groups, with higher ratings for the Beijing sample.

The model resulted in a significant discriminant function (Wilks's $\Lambda = .62$; $\chi^2 = 218.34$; $df = 5$; $p = .000$), with a canonical correlation of .616 that explained 37.9% of the variance in the dependent variable. The standardized canonical discriminant function coefficients of the discriminating variables were taken as measures of the correlations between the discriminating variables and the discriminant function. Adopting the traditional cutoff point of 0.30 (Hair, Anderson, Tatham, & Black, 1998), the highest loading was found for "global strategies" (0.54), followed by "personal attributes" (0.46), and then "length of teaching experience" (0.41). Table 8 shows the results.

Table 3. Measures of Fit of the Three-Factor Characteristics Model and Two-Factor Competencies Model

	Three-factor characteristics model			Two-factor competencies model		
Measures of fit	Beijing	Hong Kong	Beijing and Hong Kong	Beijing	Hong Kong	Beijing and Hong Kong
χ^2 to *df* ratio						
CMIN/*df*	5.04	2.48	5.16	4.82	4.25	6.82
CMIN	1027.86	506.10	1052.47	303.75	267.82	429.50
df	204	204	204	63	63	63
Comparative fit indices						
CFI	0.77	0.81	0.87	0.91	0.85	0.93
PCFI	0.75	0.78	0.84	0.87	0.81	0.89
RMSEA and probability for the testing of RMSEA						
RMSEA	0.11	0.09	0.09	0.11	0.14	0.11
PCLOSE	0.00	0.00	0.00	0.00	0.00	0.00

Note. CMIN = minimum discrepancy; df = degree of freedom; CFI = comparative fit index; PCFI = parsimony comparative fit index; RMSEA = root mean square error of approximation; PCLOSE = probability of close fit.

Table 4. Pearson Product–Moment Correlations Among the Five Characteristics and Competencies Factors, Average Length of Teaching Experience, and Average Year of Teaching Gifted Students

	Mean	*SD*	1	2	3	4	5	6	7
Beijing subscale (n = 334)									
Philosophical ideas	4.29	0.53	—						
Professional predispositions	4.29	0.52	.82**	—					
Personal attributes	4.14	0.43	.72**	.81**	—				
Specific skills	4.15	0.60	.81**	.80**	.73**	—			
Global strategies	3.95	0.70	.73**	.76**	.67**	.86**	—		
Length of teaching experience	16.08	9.48	.30**	.26**	.17**	.26**	.21**	—	
Years of teaching gifted students	4.32	5.54	.40**	.44**	.26**	.42**	.45**	.27**	—
Hong Kong subscale (n = 177)									
Philosophical ideas	3.64	0.50	—						
Professional predispositions	3.58	0.52	.81**	—					
Personal attributes	3.50	0.49	.70**	.76**	—				
Specific skills	3.32	0.62	.71**	.69**	.67**	—			
Global strategies	2.95	0.69	.50**	.55**	.54**	.68**	—		
Length of teaching experience	8.60	6.64	.23**	.19*	.17*	.22**	.10	—	
Years of teaching gifted students	2.00	3.01	.30**	.17*	.22**	.35**	.18*	.35**	—

*$p < .05$ (two-tailed). **$p < .01$ (two-tailed).

Table 5. Comparison of Means (and Standard Deviation) of the Five Characteristics and Competencies Factors Between Beijing and Hong Kong In-Service Teachers

Characteristics and competencies factors	Beijing in-service teachers (n = 334), mean (*SD*)	Hong Kong in-service teachers (n = 177), mean (*SD*)	Two-tailed significance (by *t* test)
Philosophical ideas	4.29 (0.53)	3.64 (0.50)	.000
Professional predispositions	4.29 (0.52)	3.58 (0.52)	.000
Personal attributes	4.14 (0.43)	3.50 (0.49)	.000
Specific skills	4.15 (0.60)	3.32 (0.62)	.000
Global strategies	3.95 (0.70)	2.95 (0.70)	.000

Table 6. Comparison of Means (and Standard Deviation) of the Five Characteristics and Competencies Factors Among Beijing In-Service Teachers of Four Types of Schools

Characteristics and competencies factors	Supernormal school (n = 97), mean (*SD*)	Public key school (n = 80), mean (*SD*)	*Minban* key school (n = 81), mean (*SD*)	Ordinary school (n = 76), mean (*SD*)	Two-tailed significance (by ANOVA)
Philosophical ideas	4.60 (0.44)	4.20 (0.48)	4.20 (0.52)	4.10 (0.54)	.000
Professional predispositions	4.65 (0.44)	4.18 (0.47)	4.18 (0.48)	4.08 (0.50)	.000
Personal attributes	4.30 (0.40)	4.11 (0.42)	4.08 (0.44)	4.01 (0.39)	.000
Specific skills	4.44 (0.60)	4.01 (0.49)	4.10 (0.60)	3.98 (0.59)	.000
Global strategies	4.27 (0.72)	3.96 (0.46)	3.89 (0.63)	3.57 (0.77)	.000

Note. ANOVA = analysis of variance.

Table 7. Comparison of Means and Tests of Between-Subject Effects of the Five Characteristics and Competencies Factors Among Hong Kong In-Service Teachers

	Type of school				Participated in seed project			
Characteristics and competencies factors	Government (n = 10), mean	Aided (n = 132), mean	Private (n = 20), mean	Significance (by *F*)	Yes (n = 100), mean	No (n = 62), mean	Significance (by *F*)	Interaction, significance (by *F*)
Philosophical ideas	3.47	3.61	3.91	.02	3.77	3.42	.09	.22
Professional predispositions	3.16	3.57	3.84	.00	3.69	3.40	.04	.14
Personal attributes	3.16	3.47	3.81	.01	3.60	3.32	.13	.88
Specific skills	3.05	3.33	3.65	.01	3.55	3.04	.00	.06
Global strategies	2.80	2.98	3.00	.49	3.05	2.84	.23	.23

Table 8. Multiple Discriminant Analysis Results

Step	Variables in the analysis	Beijing in-service teachers (n = 334), mean (*SD*)	Hong Kong in-service teachers (n = 129), mean (*SD*)	*F*	Significance	Standardized canonical discriminant function coefficients
1	Personal attributes	4.14 (0.43)	3.49 (0.50)	191.77	.000	0.46
2	Global strategies	3.95 (0.70)	2.94 (0.72)	115.44	.000	0.54
3	Length of teaching experience	16.08 (9.48)	8.39 (6.75)	87.88	.000	0.41
4	Years of teaching gifted students	4.32 (5.54)	2.28 (3.17)	67.81	.000	–0.24
5	Highest education level	3.17 (0.68)	2.96 (0.62)	55.75	.000	0.18

Note. Variables not in the analysis: philosophical ideas, professional predispositions, and specific skills.

Discussion

This section analyzes the results presented in the above section and discusses how the results can apply to the current gifted education system in Beijing and Hong Kong. Through the results, this section analyzes the reasons behind why teachers in each city would have such ratings on competencies and characteristics for themselves, and why Beijing teachers (especially those who taught in supernormal schools) would have significantly higher ratings than their Hong Kong counterparts. Below is the interpretation of the reliability and validity of the scale.

Based on the factor structures of the five variables applied in D. W. Chan's (2001) study, different analyses were conducted to determine whether the items were applicable for Beijing and Hong Kong samples. Cronbach's alphas for the five variables were good for both the Beijing and Hong Kong samples, ranging from .65 to .90, and the CFA results showed the structures of the five variables to have a good fit. Overall, the various tests reported in the results section showed the

33 items to be suitable for measuring the characteristics and competencies of teachers of gifted students in Beijing and Hong Kong.

The correlations among the five variables were significant and high for both locations when Beijing and Hong Kong data sets were separately analyzed. The desirable characteristics and competencies of teachers of gifted students are, as Nelson and Prindle (1992) pointed out, often used interchangeably and are strongly interconnected. A person's characteristics are hard to alter, and although the correlation results do not reveal whether the desirable characteristics were influenced by the competencies or vice versa, it is believed that there is a chance that teachers' desirable characteristics will improve if they can improve their competencies. The correlation results therefore suggest that having more teaching experience, and especially experience in teaching gifted students, may be a good way of improving the characteristics and competencies of teachers of the gifted.

According to Caspi and Herbener (1990), a person's characteristics are stable across time and circumstances. Sometimes people will change their characteristics gradually when they move to new environmental settings. Generally speaking, characteristics are difficult to change but they can still be changed when they are triggered by new stimulations. Many studies have shown the effectiveness of appropriate training on people's competencies and abilities (Galanouli, Murphy, & Gardner, 2004; Kennedy & Hui, 2006). The increase in competencies allows people to see things from views and levels that are different from the past, and thus their characteristics may be changed. For example, in Pisterman et al.'s (1992) study, parents of children with hyperactivity problems received behavioral training in parenting stress and sense of competence. After the completion of the training, the parents reported less stress and higher competence. Moreover, those parents also reported changes in their characteristics as well as in their attitudes toward their children. Therefore, it is important for the government to provide appropriate training for both pre- and in-service teachers on teaching gifted students. The more training and experiences the government provides to teachers, the higher competencies they will have in teaching gifted students. This type of teaching can be challenging for some teachers, especially when they do not have such training or experience. Training in teaching gifted students can inspire teachers to view teaching and learning from a different perspective, and hopefully their attitudes and characteristics in teaching gifted students can be improved. Next, the following two sections focus on the situations of Hong Kong and Beijing.

The Hong Kong Context

In Hong Kong, the in-service teachers from schools participating in the Seed Project gave themselves significantly higher ratings for "professional predispositions" and "specific skills" than the in-service teachers from schools not participating in the Seed Project. The in-service teachers from Seed Project schools were also older, had more teaching experience, had spent more years teaching gifted students, and had a higher educational level than their counterparts from non–Seed Project schools. Therefore, it may be appropriate for principals to select candidates who are confident of their own characteristics and competencies as teachers of gifted students, because these teachers are more willing to benefit their students by using alternative strategies to help students understand better. Such teachers are also more likely to stay in their teaching careers (Starko & Schack, 1989).

As the in-service teachers from the Seed Project schools rated themselves significantly higher in "professional predispositions" and "specific skills," it can be surmised that training programs for teachers who teach gifted students are an important factor in improving both their characteristics and their competencies. Although various universities in Hong Kong offer courses on teaching gifted students, giftedness is still a novel concept for Hong Kong teachers in general, and few in-service teachers are likely to have attended such courses or training (Phillipson & Cheung, 2007). In addition, there are few studies that focus specifically on gifted students or teachers who teach gifted students in Hong Kong (D. W. Chan, 2003), and knowledge about giftedness in the territory can be considered to be poor. It is therefore unsurprising that the less experienced and less well-trained Hong Kong teachers gave themselves low ratings in certain aspects of the teaching and managing of gifted students. Recognizing local teachers' disadvantages in this area might help preservice teacher education institutions in Hong Kong determine the gaps in the training that they offer and consider how they might go about improving the situation.

Overall, teachers who have high ratings in their competencies and characteristics of teaching gifted students are more appropriate in teaching gifted programs and may view teaching gifted students as less challenging than teachers with low ratings on the variables. Thus, it could be important for universities to evaluate the effectiveness of their programs by finding out if teachers have actually increased their competencies and characteristics through the programs offered. Through this evaluation, universities would also be able to understand how they could improve their programs. Offering inappropriate training programs is a waste of time, money, and effort for both pre- and in-service teachers.

Comparing the Beijing and Hong Kong Contexts

When the participants from Beijing and Hong Kong were compared, the MDA results revealed that the Beijing in-service teachers rated themselves very highly on "personal attributes," "global strategies," and "length of teaching experience." Beijing in-service teachers are thus likely to have a good

sense of giftedness, even if they do not teach gifted students, because of the long history of education for the gifted in the city. For example, many centers of education for the gifted have been established in Beijing since the founding of the Cooperation Research Group of Supernormal Children of China, and their goals and philosophies are well developed and followed. In addition, there are many key schools in Beijing with very intelligent students. With the longer experience in teaching gifted students in Beijing and the better establishment of philosophies of education for the gifted, it is therefore no surprise that the ratings for the characteristics and competencies variables were higher in Beijing.

According to D. W. Chan (2001), "personal attributes" refer to cultural and intellectual interests, innovation, knowledge, and achievement, whereas "global competencies" refer to general philosophical principles and methods, group processes, career education, process orientation, research, and attitude toward multiculturalism. In Wu's (2005) study, high school in-service teachers in China demonstrated a strong belief that the school environment should be the most important factor in nurturing gifted students. Wu's study suggested that teachers should provide a supportive and encouraging atmosphere and develop creative activities and programs for gifted students, to encourage such students to hold a positive attitude toward learning and achieve better learning gains than nongifted students. It is important for experienced teachers of gifted students to encourage and stimulate the motivation of these students to learn so that they perform better in school. In attempting to motivate gifted students to achieve their fullest potential academically, in-service teachers in China must be innovative, knowledgeable, and intelligent in designing suitable activities and programs; that is, they must possess the necessary "personal attributes" characteristics. Benefiting from a long history of education for the gifted and a large volume of gifted students over the years, it is clear that in-service teachers in Beijing, and especially those who teach in supernormal schools, have significantly higher levels of the necessary "personal attributes." Indeed, without these characteristics, they would probably have been dismissed by their principals or would have resigned.

One of the chief philosophies of education in China is that students should be taught to think and act in certain ways (Sisk, 1992), and it is believed that students who are properly educated in how to think and act will behave properly in the future. Another goal of education for the gifted in China is "perfection" (Sisk, 1992), but the achievement of perfection requires the guidance and counsel of teachers. The "global competencies" factors include items related to facilitating, counseling, providing academic and career advice, and leading gifted students to achieve success in the directions set by the teacher, and ultimately the country. Thus, if the aim of education for the gifted in China is to train gifted students to think and behave in certain ways, then their teachers must possess the "global competencies" to lead students in the right direction.

Conclusion

Overall, the results of this study show that in-service teachers in Beijing who had more contact with gifted students rated themselves higher in their characteristics and competencies than in-service teachers who had less contact with such students. Interestingly, a similar result was also found for the Hong Kong teachers. Thus, a practical way of increasing the competency of in-service and preservice teachers in Hong Kong in teaching gifted students would be to provide them with more training and practical experience so that they could understand these students better.

Limitation

Finally, there is a limitation in this study that is worth mentioning. The participants of this study included both primary and secondary in-service teachers. However, these two groups of teachers were not being compared, and the number in each group was unclear because this information was not specifically asked for in the questionnaire.

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