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Twenty-Five Years of Gifted Education Research in Hong Kong 1984–2008: What Lessons Have We Learned? [1]

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Published research studies in gifted education in Hong Kong based on two databases from 1984 to 2008 were surveyed to identify the field's critical priorities and practices. Research studies within the period were briefly reviewed to shed light on what we have learned regarding the conceptualization of giftedness, identifying, programming and teaching gifted learners, parenting gifted and talented children and adolescents, and counseling gifted students and their families. About 90% of the studies were descriptive studies (assessment studies, evaluation studies, and correlational research) of which 64% investigated the conceptions, assessment, and development of giftedness using quantitative methods. Suggestions were made as to how we could conduct meaningful research of the type that will sustain the development of gifted education in the next several decades.

Key words: giftedness, talent, creativity, intelligence, high ability

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Gifted Education in Hong Kong: History and Development

With the vision to promote research in different areas of education in Hong Kong, the Hong Kong Educational Research Association was established some twenty-five years ago by a small number of education researchers and practitioners who perceived the need to build their practices on a sound research base. Gifted education at the time was not an important area, and might generally be considered a natural extension of the field of educational psychology and special education. Accordingly, research in gifted education could be largely research studies conducted mostly by educational psychologists to inform educational practices for children with special educational needs. Therefore, it is understandable that the research focus at the time was mostly on intelligence, the development of intelligence tests, and intellectual assessment to identify students who would benefit from remedial education or a more differentiated education to meet their intellectual capacity.

Perhaps, gifted education could be regarded as not being placed on the education agenda until 1990 when the Education Commission issued its Report No. 4 (Education Commission, 1990). The report identified serious inadequacies in education for Hong Kong's most bright and talented students. The most enduring legacy of the report was the first Hong Kong definition of giftedness modeled after the Marland Report in the U.S. The report also highlighted policies that had implications for practices in gifted education in the succeeding years (see Chan, 1998).

It was also in the years around 1990 that one witnessed greater public awareness of the need for gifted education, with progressive educators advocating for appropriate educational opportunities for gifted children. Private grants from charity organizations such as the Hong Kong Jockey Club and the Fung Hon Chu Trust Fund helped fund some of the seminal practice programs and corresponding practice-oriented research or evaluation studies. While one would expect that this convergence of public interest, research agendas, and funding could allow for a baseline of research to be established, a systematic and organized research agenda that could inform policies and practices along with a serious commitment from the government to fund such research failed to emerge.

Despite the lack of research funding and the lack of a clear agenda for gifted education research, there is a growing body of research studies relevant to gifted education over the span of the last two decades. During the period, educational research and socio-political interests have surged

and faltered, with public perceptions of gifted education ranging from viewing it as a critical need to viewing it as an elitist luxury. On the other hand, education practitioners continue to discuss the need for establishing a sound gifted education research base on which to build practices. Nonetheless, it is timely to critically review and rigorously examine gifted education research in the past 25 years as a way to identify critical priorities and practices, and to explore how we are doing as a field in conducting meaningful research of the type that will sustain further growth and development of gifted education in the coming years.

Research Studies in This Review

Inclusion/Exclusion Criteria

To limit the scope of research work under review, we have made specific decisions to review only published journal articles, because they characterize the attentions and activities of scholars within a field or discipline, and they reflect research priorities and prevailing practices. Based on this consideration, we decided not to review any unpublished reports, newsletter articles, review articles, conference papers or books on the topic.

To identify pertinent journal articles, we searched two databases, ERIC and PsyINFO, for journal articles published within the period of 1984 to 2008, the 25-year period since the founding of the Hong Kong Educational Research Association. A total of 196 journal articles were gathered based on the search using the keyword “Hong Kong” together with “gifted” or “giftedness;” with “talent,” “ talents,” or “talented;” with “creativity,” or “creative;” with “high ability,” “high abilities,” “high potential,” or “high potentials;” and with “intelligence,” “intelligent,” or “intelligences.”

Levels of Analysis

Specifically, each journal article underwent four levels of review in the analysis process. On the first level, we asked the critical question: Is the article a research article? To be considered a research publication for the purpose of this study, we decided that the article should contain a method section describing how the author(s) systematically collected data and recorded data, and analyzed and interpreted the data. As a result, 98 articles

related to giftedness research (including research studies related to the conceptions, assessment, and development of intelligence and creativity with implications for gifted education) met our initial criteria, and were selected to be considered as evidence for this investigation.

On the second level, we asked the critical question: What was the mode of inquiry used in the study? The mode of inquiry represents the research logic connecting the study to the larger knowledge base in gifted education. We decided to arbitrarily classify all research studies into five categories based on the classification of Best and Kahn (2003) on research approaches. The five categories include: historical research; descriptive studies that include assessment, evaluation, and correlational research; experimental and quasi-experimental research; single-subject experimental research; and qualitative research that includes case studies.

On the third level, we asked the critical question: What was the content area of the study? We read each article and classified the study into one of the following four content areas. These four content areas are: conceptions, assessment, and development of giftedness and different aspects of giftedness; teaching, programming and evaluating gifted programs; family influence; and social and emotional development of gifted learners.

On the fourth level, we asked the critical questions: What lessons do we learn from the study? What could be the application areas? We tentatively classified application as falling into the following areas: assessing giftedness and talents, programming and teaching gifted learners, parenting gifted children and adolescents, and counseling gifted students and their families.

Research Studies: Content Areas and Research Approaches

We read each of the 98 selected articles that have passed our first level of analysis as research articles. To make sense of each article's contribution in connection with other articles in the review, we summarized the stated objectives and the major findings of the article, and made the judgment for the most appropriate classification of the article into one of our four content areas. These four content areas have proved to be reasonably comprehensive, as we did not find any article in our review being considered as unclassified. We also examined carefully the major research methods used in each of the studies and classified each article as adopting one of the five research approaches in the scheme of Best and Kahn (2003).

Any discrepancies in judgment were resolved by discussion. The classification results are presented in Table 1 which shows the cross-tabulation of research studies under the four different content areas by the five categories describing research approaches.

From Table 1, it can be seen that the bulk of research studies we reviewed could be classified as descriptive studies (90%) that broadly include assessment studies, evaluation studies, and correlational research. These descriptive studies fall mostly in the content areas of conceptions, assessment, and development of giftedness (57%), followed by the content areas of teaching, programming, and evaluation of gifted programs (18%). We considered in greater details the research studies under each of the four content areas.

Conceptions, Assessment, and Development of Giftedness

Although intelligence and creativity are often associated with the assessment or identification of giftedness and talents, researchers in studies on intelligence and creativity we included in this review have rarely connected their studies with the gifted population. However, their contributions to our understanding of giftedness in the Hong Kong Chinese setting should not be underestimated.

Intelligence

Assessment instruments. Specifically, studies on intelligence generally focused on the development of assessment instruments or evaluating the equivalence of the Chinese versions of the assessment instruments with the original English versions. For example, researchers examined the Chinese (Cantonese) version of the Wechsler scale for children with the original English version (Chan, 1984; Chan & Lin, 1996; Lee & Lam, 1988), evaluated the development of the Chinese vocabulary test as a part of Wechsler scale for adults (Chan, Lee, & Luk, 1999) and for adolescents (Chang, Tang, & Chan-Ho, 1995), and provided local normative data on the assessment of intelligence using the Wechsler scale for adults (Chan, Lee, & Chan, 2000).

Ability measures and reaction time. Using the Progressive Matrices as an IQ measure, Lynn, Chan, and their colleagues conducted a series of studies that demonstrated the superiority of the Hong Kong samples in mean IQ score as compared with the mean IQ score of Caucasian samples

Table 1 The 98 Reviewed Studies by Content Areas and Research Approaches

Research Approaches	Content Areas							
	Conceptions, Assessment, and Development of Giftedness		Teaching, Programming and Evaluating Gifted Programs		Family Influence		Social and Emotional Development of Gifted Learners	
Historical research		0		0		0		0
Descriptive studies (assessment, evaluation, and correlational research)	Chan (1984); Chan (2000a); Chan (2000c); Chan (2001a); Chan (2004a); Chan (2006b); Chan (2007a); Chan (2007b); Chan (2007c); Chan (2007d); Chan (2007e); Chan (2008a); Chan (2008b); Chan & Chan (1999); Chan, Cheung, Lau, Wu, Kwong, & Li (2001); Chan, Lee, & Chan (2000); Chan, Lee, & Luk (1999); Chan & Lin (1996); Chan & Lynn (1989); Chan, Eysenck, & Lynn (1991); Chang, Tang, & Chan-Ho (1995); Chen & Chen (1988);Cheung, Rudowicz, Yue, & Kwan (2003); Cheung & Yue (2007); Cheung, Lau, Chan, & Wu (2004); Cheung, Tse, & Tsang (2001); Cheung, Tse, & Tsang (2003); Flynn (1991); Forrester & Hui (2007); Furnham, Rakow, & Mak (2002); Hamid & Lok (1995); Hui & Rudowicz (1997); Ip, Chen, & Chiu (2006); Jaquish & Ripple (1984-85); Kitto, Lok, & Rudowicz (1994); Lau & Li (1996); Lee &	56	Chan (2000b); Chan (2000d); Chan (2000e); Chan (2001b); Chan (2005c); Chan (2008c); Chan, Cheung, Chan, Leung, & Leung (2000); Chan, Cheung, & Yeung (2000); Phillipson & Tse (2007); Tirri, Tallent-Runnels, Adams, Yuen, & Lau (2002); Zhang (1999); Zhang (2000);	18	Chan (2005b); Chan (2005d)	2	Chan (2001c); Chan (2002a); Chan (2002b); Chan (2003a); Chan (2003b); Chan (2003c); Chan (2004b); Chan (2005a); Chan (2005e); Chan (2006a); Chan (2007f); Wong, Foo, Wang, & Wong (2007)	12

	Lam (1988); Lynn, Chan, & Eysenck (1991); Lynn, Hampson, & Lee (1988); Lynn, Pagliari, & Chan(1988); Lynn & Tse-Chan (2003); Moneta & Siu (2002); Niu, Zhang, & Yang (2007); Poon, Yu, & Chan (1986); Quek, Ho, & Soh (2008); Rudowicz (2004); Rudowicz & Hui (1997); Rudowicz, Lok, & Kitto (1995); Rudowicz & Yue (2000); Rudowicz & Yue (2002); Yue (2001); Yue (2003); Yue (2004); Yue & Rudowicz (2002); Yuen & Furnham (2005); Zhang & Sternberg (1998)		Zhang (2001); Zhang (2002); Zhang (2004a); Zhang (2004b); Zhang & He (2003); Zhang & Postiglione (2001)				
Experimental and quasi-experimental research	Cheung, Roskams, & Fisher (2006); Hui & Lau (2006); Lam & Chiu (2002); Wan & Chiu (2002); Wu, Cheng, Ip, & McBride-Chang (2005)	5	Chan (2001d); Chan (2003d)	2		0	Wong & Watkins (2001)	1
Single-subject experimental research		0		0		0		0
Qualitative research (case study)	Ho, Tsang, & Ho (1991)	1	Fai (2000)	1		0		0
Sub-total	**62**		**21**		**2**		**13**	

from the U.S. and the U.K. in the general population (Lynn, Pagliari, & Chan, 1988), among 4th graders (Lynn, Hampson, & Lee, 1988), and among 6-year-olds (Chan & Lynn, 1989). Following the study by Poon, Yu, and Chan (1986) who asserted that reaction time might measure cognitive processes in parallel to IQ assessments of general mental ability based on the correlation between auditory reaction time and scores on the Standard Progressive Matrices, they also used reaction time as an alternative measure of intelligence (Chan, Eysenck, & Lynn, 1991) and found that Hong Kong students had a higher mean IQ and faster reaction time in performing certain tasks (Lynn, Chan, & Eysenck, 1991). However, the comparison has elicited controversies (Flynn, 1991). More recently, Lynn and Tse-Chan (2003) also conducted a study to examine sex differences on the performance of the Progressive Matrices, and they found a result slightly favoring males.

Self-estimates and concepts of intelligence. Aside from the ability measures of intelligence, some researchers were interested in how people understand intelligence as a concept or in people's self-estimates of intelligence. Chen and Chen (1988), for example, investigated two student groups' conceptions of intelligence (Chinese-school graduates and English-school graduates) and found that both groups equally rated non-verbal reasoning as the most relevant skill to measuring intelligence, and the Chinese-school graduates tended to rate verbal reasoning to be less relevant than did the English-school graduates. In other studies, self-estimates of intelligence were the focus. In general, these studies on self-estimates of intelligence yielded findings that the age of children and the self-rated overall IQ of both parents were the best predictors of the children's overall estimated IQ (Furnham, Rakow, & Mak, 2002), and gender stereotyping favoring male pervaded in estimates of intelligence for oneself and for one's parents (Hamid & Lok, 1995). More recently, Yuen and Furnham (2005) extended this research paradigm to self-estimates of multiple intelligences, examining sex differences of Hong Kong adolescents in self-estimation of their own and their parents' IQ score on each of Gardner's 10 multiple intelligences. Similarly, with a broadened notion of intelligence, Zhang and Sternberg (1998) also applied their pentagonal implicit theory of giftedness developed in a non-Chinese setting to a sample of in-service and pre-service teachers at the University of Hong Kong, with findings that had implications for identification, instruction, and programming for the gifted.

Creativity

Assessment instruments. One focus area in the studies on creativity is assessment. These contributions include the measurement of creative thinking in an activity-based approach (Kitto, Lok, & Rudowicz, 1994), the validation of the Torrance Tests of Creative Thinking together with a cross-cultural comparison (Rudowicz, Lok, & Kitto, 1995), the development and validation of the Chinese Creative Writing Scale (Cheung, Tse, & Tsang, 2001), the validation of the Test of Creative Thinking — Drawing Production (Rudowicz, 2004), and the norming of the Wallach-Kogan Creativity Tests (Cheung, Lau, Chan, & Wu, 2004). More recently, with a cross-cultural perspective, Niu, Zhang and Yang (2007) measured creative thinking by creative writing and insight problem-solving tasks, and examined the relationship between deductive reasoning and creativity across cultures. The results showed significant cultural differences favoring American participants on creative writing and insight problem-solving tasks.

Conceptions and the creative personality. Another focus area in the research on creativity is the investigation on the conceptions and core characteristics of creativity and the creative individual as perceived by different groups of Chinese people, as exemplified in the studies by Rudowicz, Yue, and their colleagues. Participants of these studies included the general adult population, frequently nominated creative people, university teachers, undergraduates, and parents in Hong Kong (Hui & Rudowicz, 1997, Rudowicz & Hui, 1997), undergraduates in Beijing, Guangzhou, Taipei and Hong Kong (Rudowicz & Yue, 2000, 2002; Yue, 2001; Yue & Rudowicz, 2002), undergraduates in Hong Kong and Guangzhou (Yue, 2003), and undergraduates in Guangzhou, Hong Kong, Nanchang, Nanjing and Xian (Yue, 2004). In general, the characteristics of the creative personality and those of the Chinese personality were perceived as distinct (Hui & Rudowicz, 1997, Rudowicz & Yue, 2002), and the core characteristics of creativity were perceived to include originality, innovation, thinking and observation skills, flexibility, willingness to try, self-confidence, and imagination (Rudowicz & Yue, 2000; Yue, 2001). In particular, Cheung and Yue (2007) found that for Chinese creators who were famous, a moderate level of creativity was associated with the highest fame.

Other researchers have also contributed to the understanding on how creativity was perceived by different groups of Hong Kong people. Notably,

Lau and Li (1996) were interested in the question whether popular students were viewed by peers and teachers as creative, and found positive answers to the question. In another study, Chan and Chan (1999) asked primary and secondary school teachers to list the personality and behavioral characteristics of creative or uncreative students to understand their implicit theories of creativity. Similarly, Quek, Ho, and Soh (2008) also studied the implicit theory of creativity by comparing the beliefs regarding various aspects of creativity among trainee-teachers in Hong Kong and Singapore. In yet another study, Cheung, Tse, and Tsang (2003) investigated Chinese language teacher's perception of creativity and what they believed to be the best ways to foster students' creativity.

Motivational and developmental variables. Researchers were also interested in understanding creativity in the Hong Kong context through linking creativity with motivational variables such as regulatory focus (Ip, Chen, & Chiu, 2006; Lam & Chiu, 2002) and intrinsic/extrinsic motivation (Moneta, & Siu, 2002) in investigations of both individual differences and experimental manipulations to reveal interesting relations. Researchers also linked creativity to some developmental variables. For example, Cheung, Rudowicz, Yue, and Kwan (2003) found that field and year of study in university did have some impact on students' creativity. Wu, Cheng, Ip, and McBride-Chang (2005) explored creativity in relation to age. As university students were found to be significantly more creative than Grade 6 students on the real-world-problem task but less creative on the figural task, they argued that knowledge, thinking styles, language ability, and motivation accounted for differences in performances on creativity tasks across age. Jaquish and Ripple (1984–85) also contributed to the study of the developmental aspects of creativity. They assessed fluency, originality, and flexibility in participants' written responses to groups of acoustical stimuli across five age groups ranging from children to middle-aged adults. They found significant age-related differences in fluency and flexibility favoring adolescents. Using available American data, they also made some interesting cross-cultural comparisons. In a way, findings from these studies have implications on the training or enhancement of creativity of students.

Creativity enhancement. Enhancing or training for creativity also formed another focus area of research. For example, there were reports of success in enhancing university undergraduates' performance in a subsequent test of creativity through training in novel conceptual combination problems (Wan & Chiu, 2002), in training university students'

creative thinking by a one-semester out-of-discipline training course (Cheung, Roskams, & Fisher, 2006), and in enhancing primary students' creativity by a 16-week after-school drama curriculum (Hui & Lau, 2006). Forrester and Hui (2007) also identified the critical role of creativity in Hong Kong educational system and investigated the contextual practice of creativity in primary classrooms. They found support for both systems theory (Csikszentmihalyi, 1996) and componential theory (Amabile, 1983, 1996), and reported that teachers were significant gatekeepers in the development of students' creative potential.

Different Aspects of Giftedness and Multiple Intelligences

Unlike studies reviewed above with a focus on studying intelligence or creativity in the general or student populations, Chan conducted programmatic research targeted on gifted students. Research samples were students nominated by their teachers to join the gifted programs at the Chinese University of Hong Kong. As teachers' nominations were based on their judgments on different aspects of giftedness, these nominated students could be regarded as relatively heterogeneous with respect to their gifts and talents.

Working with the view of a broad conception of giftedness, Chan sought to assess giftedness in students through developing and validating assessment instruments to tap giftedness in different areas. These efforts include the assessment of leadership using the Roets Rating Scale for Leadership (Chan, 2000a), creativity using the Wallach-Kogan Creativity Tests (Chan et. al., 2001), musical talent using the Musical Aptitude Profile and the Musical Association Task (Chan, 2007d, 2007e), visual-spatial talent using the mental rotation test (Chan, 2007b), the Impossible Figures Task as well as the Clark's Drawing Ability Test (Chan, 2008a), and more generally, multiple intelligences using the Student Multiple Intelligences Profile (Chan, 2001a, 2004a). Chan also demonstrated that teachers could use the Scales for Rating Behavior Characteristics of Superior Students (Chan, 2000c) as a checklist of students' behavior characteristics to facilitate nomination.

In general, the theory of multiple intelligences (Gardner, 1983) could be regarded as providing a general framework for Chan's series of investigation on giftedness and the relationships among different aspects of giftedness. For example, in one study Chan (2001a) sought to understand the possible contributions multiple intelligences could make in the

identification of gifted students and found that students' self-report of multiple intelligences did not predict the conventional IQ measures, suggesting that there could be a complementary and independent role for multiple intelligences in identification (Chan, 2001a). In other studies, he found that intrapersonal and verbal-linguistic intelligences emerged as common and significant predictors of leadership (Chan, 2007a), and musical intelligence significantly predicted global musical aptitude and its components (Chan, 2007e).

Interested in how students perceived themselves in different realms of intelligence, Chan consistently found that Hong Kong gifted students perceived their relative strengths in traditional giftedness such as verbal-linguistic and logical-mathematical intelligences, and their relative weaknesses in bodily-kinesthetic intelligence and naturalist intelligence (Chan, 2001a, 2004a, 2006b). In addition, there were few gender differences in the self-perception of multiple intelligences, considering that male and female students reported largely similar number and nature of dimensions of perceived multiple intelligences and similar structural relationships among the eight intelligences (Chan, 2006b). However, in comparing students' perceptions of multiple intelligences with four other perspectives (from teacher, father, mother, and peer), Chan (2004a) found that the typical profiles from these perspectives were not the same, with more similarity between the mother perspective and the father perspective than between those of teacher and peer. Students' perceived leadership and creativity were found to be more predictable using the multiple intelligences from their own perspective.

To examine how different conceptions of intelligence contributed to the conception of giftedness, Chan (2008b) explored the common dimensions assessed by multiple intelligences, emotional intelligence (Mayer & Salovey, 1997), and successful intelligence (Sternberg & Grigorenko, 2002). He found that gifted students' self-perception of giftedness could be described with three dimensions: the global, the social-emotional, and the artistic intelligence. In the same connection, gifted students could be generally classified into four clusters: the supersmart, the socio-emotionally gifted, the modest, and the artistically gifted. In another study, Chan (2007c) also linked leadership to emotional intelligence as well as successful intelligence, and found that practical abilities and management of emotions emerged as common and significant predictors in predicting the leadership components.

Giftedness in Special Populations

Research on giftedness in special populations is very rare in Hong Kong. The only study we reviewed was a single-case study by Ho, Tsang, and Ho (1991) who investigated a calendar savant to understand his exceptional proficiency in calendar calculation. Interestingly, they found no support for the hypotheses proposed in earlier studies on calendar savants. The savant's ability was interpreted as related to the familiarity of 14 calendar templates and the knowledge of matching the templates to each individual year.

Teaching, Programming and Evaluating Gifted Programs

Related Studies in the General Population

Some of the studies we reviewed bear on teaching and learning, but gifted students were not the target of investigations. Notable studies include those conducted by Zhang and her colleagues on intellectual and thinking styles mainly with university students from Hong Kong and other areas. These studies investigated the power of self-rated abilities for predicting cognitive development, intellectual styles and personality traits (Zhang, 2004a), the relationship between thinking styles and academic performance (Zhang, 2001, 2004b), thinking styles in the use of and attitudes toward computing and information technology (Zhang & He, 2003), thinking styles and modes of thinking (Zhang, 2002), thinking styles and self-esteem (Zhang & Postiglione, 2001), learning approaches and academic achievement (Zhang, 2000), and thinking styles and student characteristics (Zhang, 1999).

One relevant study not related to other studies in this content area is the one on underachievement by Phillipson and Tse (2007). Specifically, they assessed the intellectual ability and mathematical achievement of 957 Primary 5 students in Hong Kong to estimate the proportion of students who were underachieving at all levels of ability using the Rasch measurement model. Although gifted students were again not the target of investigation, the study had implications for the identification and teaching of gifted underachievers.

Related Studies with Gifted Students

With gifted students as the target of investigation, Chan has conducted a number of studies aimed to enhance the teaching and learning of gifted

students in Hong Kong. These studies investigated the learning styles of gifted and nongifted students (Chan, 2001d), the characteristics and competences of teachers of gifted learners (Chan, 2001b), the perceived multiple intelligences and learning preferences among gifted students (Chan, 2005c), and the goal orientations and achievement among gifted students (Chan, 2008c).

Developing and Evaluating Gifted Programs

Chan and his colleagues also contributed substantially to the development and evaluation of gifted programs in Hong Kong. Specifically, these programs included various university-based summer residential enrichment programs for the gifted (Chan, Cheung, Chan, Leung, & Leung, 2000; Chan, Cheung, & Yeung, 2000). Evaluative ratings on different aspects of these programs indicated that program participants and their parents, program instructors, teaching assistants and residential counselors gave positive comments and expressed overall satisfaction with the programs. Participating students also gave higher ratings on leadership ability and creativity in post-program assessment than in preprogram assessment. In summary, these programs provided information, knowledge and experience to guide the nomination and identification-selection procedures, and the development of curriculum for teaching gifted learners.

Valuing the mentoring relationship in educating gifted and talented students, Chan developed the mentorship programs at the Chinese University of Hong Kong (Chan, 2000d). He first formulated some general guidelines for arranging mentorship, and then conducted a survey to identify university faculty members who were interested in mentoring gifted students from secondary schools. Finally, with reference to a writing workshop program at the university with a website component, Chan proposed a model of three levels of mentoring, which composed of telementoring, double mentoring (involving expert-mentor, and teacher-mentor or even peer-mentor), and conventional one-to-one mentorship. The effectiveness of this model of three levels of mentoring and the mentorship program in the Hong Kong setting need to be carefully evaluated in future studies.

Going beyond enrichment and mentorship programs that were often targeted for intellectually or academically gifted students, Chan also turned his attention to develop creativity and leadership training programs for students. Prior to program development, he conducted a study to assess the

needs of schools for leadership training and the endorsement of university-school collaboration in sharing the provision of skills training and of practicum experiences in the training of student leaders (Chan, 2000e). Then he developed the Creative Leadership Training Programs (CLTP; Chan 2000b) that incorporated three crucial components of teaching leadership characteristics, teaching leadership skills, and putting students into leadership roles in activities. After receiving university-based training, students were supported to assume leadership roles in their own schools in setting up peer support programs in peer tutoring and peer counseling.

The effectiveness of the training component of the CLTP was evaluated by Chan (2003d), comparing two groups of gifted students: the CLTP participants and the non-participants. The results of preprogram and post-program measures of divergent thinking and self-report leadership qualities of the two groups indicated that CLTP participants gained confidence as leaders, especially in skill areas of communication and public speaking, and in regulating emotions and generating alternatives in social problem solving.

Other Evaluation Studies

There are in our review two relevant studies that could be grouped under this content area as evaluation studies although they were not targeted at gifted programs but were at gifted education and school enrichment courses in general. One study examined the cross-cultural differences in teachers' attitudes toward gifted education in Finland, Hong Kong and the United States, which had implications on teaching gifted learners (Tirri, Tallent-Runnels, Adams, Yuen, & Lau, 2002). Another is a case study that investigated the perceptions of gifted students in four secondary schools towards the regular classroom environment before and after they attended enrichment courses. The schools under study had not developed explicit policies and most students were dissatisfied with the regular classroom learning, particularly after attending enrichment courses outside schools (Fai, 2000).

Family Influence

Research studies that we reviewed in this content area are few in number. There are two studies and both studies were conducted by Chan who worked on the conjecture that family environments valuing independence as

opposed to interdependence tended to nurture creativity as opposed to achievement. Specifically, he assessed the self-perceptions of Hong Kong gifted students regarding their talent areas and their family environments (Chan, 2005b), and their creativity, family hardiness, and emotional intelligence (Chan, 2005d). The findings indicated that parental expectations and family cohesion (interdependence) were the significant predictors for talents, whereas family hardiness and emotional intelligence had separate and direct effects on creativity, and their effects were additive rather than multiplicative. Despite the limitations of both studies, the findings had implications for clarifying the role of Hong Kong Chinese family environments in affecting the talent and creativity development of gifted children and adolescents.

Social and Emotional Development of Gifted Learners

Related Studies in the General Population

There were a number of studies that were not targeted on the gifted population for investigation but had implications on the social and emotional development of gifted students. For example, Wong, Foo, Wang, and Wong (2007) examined the potential nurture factors in the development of emotional intelligence of university students in Singapore, Hong Kong and Taiwan. The findings not only had implications for the research on emotional intelligence, but also provide information and knowledge on the development of emotional intelligence among gifted learners. In addition, Wong and Watkins (2001) studied the relationship between student self-esteem and ability grouping in the Hong Kong context. The findings supported the Big Fish Little Pond effect of ability grouping within but not between schools, and had implications for school policies such as classes for the gifted and inclusion of children with learning difficulties in the regular classrooms.

Related Studies with Gifted Students

Research studies that were targeted at gifted students included a number of studies by Chan. Four areas could be differentiated: self-concept, adjustment problems, perfectionism, and social coping.

Self-concept. In a study with gifted adolescents, Chan (2001c) found that these students could differentiate six domains of self-concept, and that their global self-concept could be predicted by their scores on particular domain-specific self-concept. In another study, Chan (2002b) linked self-concept to the perception of giftedness, and found that students' difference concern and critical evaluation affected adversely their specific self-concepts, but high parental expectations had a more positive influence, with self-concept domains related to social acceptance and friendship issues being most strongly affected.

Adjustment problems. To study the variety of gifted students' adjustment problems, Chan (2003a, 2003b) developed the Student Adjustment Problems Inventory, and identified intense involvement, perfectionism, unchallenging schoolwork, multipotentiality, and parental expectations as common problems among gifted students. He also found that unlike traditional IQ measures which were not found to be associated with adjustment problems, specific multiple intelligences could predict specific adjustment problems (Chan, 2003a). To examine the relationships among giftedness, adjustment problems, and psychological distress, Chan (2002a) found that divergent thinking had a notable influence on specific psychological symptoms and students' concerns with interpersonal relationship, the recognition of their abilities and their concerns for being different emerged as important adjustment problems predicting specific psychological symptoms. In addition, Chan (2006a) demonstrated that the effects of adjustment problems on psychological distress could be direct, but more importantly the effects could also be mediated by self-efficacy.

Perfectionism. Chan (2007f) has also investigated more extensively on one specific adjustment problem, namely, perfectionism. Specifically, he made a distinction between positive perfectionism or the striving for excellence and negative perfectionism or pathological perfectionist tendencies. His findings revealed that gifted students tended to endorse positive perfectionism more than negative perfectionism. Although positive and negative perfectionism had impact directly on subjective well-being, there was suggestive evidence for the mediating role of general self-efficacy in the relationship.

Social coping. Moving from describing students' adjustment problems to exploring how students actually coped with the problems of being gifted, Chan (2004b) used the Social Coping Questionnaire and found that students' gender, age, and nonverbal IQ had notable effects on their specific social coping strategies. Coping by valuing peer acceptance and coping by

avoidance emerged as two of the most important social coping strategies predicting specific psychological symptoms. In the context of emotional intelligence, Chan (2003c) found that social skills emerged as the most important component of emotional intelligence predicting the use of strategies of valuing peer acceptance and involvement in activities. Furthermore, Chan (2005a) also found that the effects of self-relevant and other-relevant emotional intelligence on psychological distress were mediated by avoidant coping and social-interaction coping, respectively. On a higher level of generality, Chan (2005e) found that social-interaction coping and minimizing-differences coping as two higher-order coping strategies encompassed the seven specific coping strategies that correlated differentially and to various degrees with each other for the children and the youth groups

Research Studies: Applications and Lessons

If the practice of gifted education is to improve, the research base must shift from describing the phenomena or conceptualization of giftedness to identifying and verifying best practices for gifted education. Therefore, we focused on what lessons we have learned from these studies in the following areas: assessing and identifying gifted learners, teaching gifted learners and developing/evaluating gifted programs, parenting gifted children, and counseling gifted students and their families.

Content and Application Issues

Assessing and Identifying Gifted Learners

A relatively large proportion of research studies in our review could be classified as studies intended to deepen our understanding of giftedness through examining different conceptions of giftedness especially in relation to the conceptions and assessment of intelligence and creativity. One would expect that the knowledge we have gained in this domain could be put into use to help us assess and identify gifted learners, assuming that recognition of gifts and talents is the first step in talent development. However, given the diversity of conceptions and the multiplicity of assessment approaches, applications in this area are anything but straightforward.

Perhaps, the lesson that we have learned is that giftedness is multidimensional, and cannot be captured by unitary intelligence or an IQ score. While traditional educational psychologists or psychometricians might still hold on to the view that an IQ score above a certain cutoff point defines giftedness, there is a greater acceptance of multiple modes of assessment and multiple criteria for giftedness beyond the traditional IQ score. Despite the accumulating number of studies on domain-specific assessment of giftedness and talents, the emphasis has often been on studies based on self-reported instruments or the development of self-reported assessment tools rather than ability measures or performance tasks for assessment.

With the broadened notion of giftedness, global and domain-specific assessment should go hand in hand. The concept of identifying gifted learners perhaps should be replaced by one of assessing the specific giftedness in learners. Ideally, there should be a sequential strategy in assessing giftedness and talents from nominations, behavioral checklists, and self-reported instruments, to ability and performance measures. The development of an assessment or profiling system should constitute an important challenge in application.

Teaching Gifted Learners

Most of the relevant studies we reviewed have largely emphasized the learning styles or learning preferences of students, and the teaching styles or teaching strategies of teachers, spreading to the considerations about the characteristics and competencies of teachers of gifted learners. Since these studies have implications for effective teaching and learning in gifted education, one would expect applications in areas of the design and development of gifted programs or curricula for gifted learners. Regarding program development and evaluation, the few studies that we reviewed are mainly in leadership programs. There are no reported programs in the conventional curricula such as language arts, mathematics, or science, or in nonacademic areas such as fine arts and music. It is not known whether they are mostly descriptions of development that were not included in the databases we accessed or they did not pass our criteria of being considered research studies.

Contrary to expectation, however, there seems to be a disjunction between the teaching-learning research area and the program development

research area, which might prevent program providers from obtaining the full benefit of effective and best practices supported by teaching-learning research. While the lack of good communication and exchanges between researchers and practitioners is not confined to this area, the importance of evidence-based practices in teaching gifted learners should receive greater emphasis.

There are certainly other important applications based on the teaching-learning research studies. One is in teacher education, if we are to emphasize evidence-based practice in teaching gifted learners by our teachers in their professional training. We might need to expand this area of research, such as the research on teachers' self-efficacy in teaching gifted learners or teachers' mindsets of an incremental or entity view of intelligence, if we are to provide certification of teachers as teachers of gifted learners in the future.

Parenting Gifted Children

The studies on family environments and family influence should have the greatest relevance for the applications on how best we could nurture or parent gifted children. Surprisingly, there are very few studies targeted at gifted children, despite the claim that Chinese parenting could be special and parental expectations could be very high. In the two studies that we reviewed, there was no evidence suggesting that family cohesion or interdependence could be inimical to creativity. Rather, interdependence could be conducive to both achievement and creativity. While we need replications with new samples and similar measures to ensure generalizability of these results, it was reassuring that Chinese parenting was not antithetical to talent development. However, future studies might need to delineate the conditions under which valuing interdependence could promote or impede, for example, the cultivation of creativity.

There are many unexplored areas in the study of family influence (such as family structure, family communication, and sibling relations) that could provide great insights into parenting gifted children and adolescents. We also need to conduct studies that focus on the changing role of family influence at different stages of the development of the gifted child. Such studies should have great implications for parenting as well as counseling.

Counseling Gifted Students and Their Families

The studies on the issues of social and emotional development of gifted students should be most valuable for the applications in counseling. This review identified four major areas that included gifted students' self-concept, their adjustment to being gifted, their perfectionism, and their social coping.

In helping gifted students, counselors and teachers need to attend to their different domain-specific self-concepts in addition to their global self-concepts. The domains of social acceptance and friendship are most strongly affected by their perceptions of being gifted. It is also helpful to become more sensitive to the common adjustment problems of gifted students, and the psychological distress such as anxiety and dysphoria commonly associated with their specific adjustment problems. In addition, efforts should be made on helping students view adjustment problems positively and enhance their self-efficacy to reduce their psychological distress as well as to promote their subjective well-being. In coping with being gifted, students generally either cope by minimizing the differences from peers or cope by promoting social interactions with peers. Given the more positive outcome of the latter, counseling gifted students to promote their social interaction might help them recognize talents and strengths in themselves, as well as in others, and become more committed to developing their talents.

While a good understanding of these issues certainly could help counselors to become more effective in counseling gifted students, there is again a lack of studies that focus on the process of changes on these issues across time and development, which could be equally if not more crucial in the choice of intervention efforts.

Evidently, there are many unexplored areas that require more research work to inform practice. These areas include underachievement, double exceptionality, and relationships with psychological problems and psychiatric conditions. Given the possibly asynchronous development of the gifted students and their sensitivity to societal issues, counseling should assume greater importance in the talent development of gifted students, nurturing them from giftedness to talented performance and eminence.

Methodological Issues

Research studies that we reviewed were generally descriptive studies that include assessment studies, evaluation studies and correlational research. Most of these studies had sampling issues that make replication very difficult. We did not identify any study that could be classified as historical research, even though biographic studies of gifted and eminent individuals are not uncommon in this field. We also did not have qualitative studies that respect different perspectives and allow us to gain in-depth insights into the process of talent development. We really did not have any true experimental studies with random assignment of children to different conditions or with well-controlled investigations contrasting groups or conditions to test hypotheses or evaluate interventions. We only had a few studies that could be called quasi-experimental in their group comparisons.

Overall, we have not been effective in developing replication studies that would build on earlier work and take it to a higher level. We have not built systematic research programs that connect studies to one another and provide a basis for sound generalizations that could inform policies and practices. In this connection, we need to conduct more program evaluation studies that provide evidence of program effectiveness and desirable results in serving gifted students as a specific population in schools. More importantly, we need to mount true longitudinal studies that allow us to see talent development processes unfold over time, and replication studies that test the same interventions under different conditions with gifted and non-gifted populations. Given the advances in the methodology and procedures of qualitative research, more attention should also be accorded to studies using qualitative methods in addition to studies using quantitative methods.

Conclusion

Investigation on the published research of a field is a clear window into the priorities and practices of that discipline. In this investigation, we looked broadly at the topics that have been most prominent in the research of gifted education in the 25-year history of the Hong Kong Educational Research Association. The distinct research efforts in gifted education have been present since the 1990s, and describing the phenomena of giftedness remained an important area of inquiry, even though we have very few theories to guide and organize our efforts. For pragmatic reasons, we need

to conduct more studies targeted at the gifted population to inform our practice in teaching and learning, in parenting, and in counseling our gifted children and adolescents.

In summary, as gifted education researchers, we need to enlarge the scope of the types of research topics studied in the field, using more rigorous research designs with quantitative and qualitative methods. We need to develop studies that help us understand giftedness and talent development, and studies that yield generalizable and practical findings to inform our practice. Collaborative efforts with researchers from other disciplines such as biology, sociology, and psychology might also help us expand and explore uncharted areas in this important field of education.

Note

1. K. C. Tang serves as action editor for this article.

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