A Cross-Cultural Study of Teachers' Instructional Practices in Singapore and the United States

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This cross-cultural study, utilizing a structured instructional behavior rating form, examined distinguishing and comparable teaching practices in secondary gifted classrooms in Singapore and the United States. Teachers from Singapore (n = 67) and teachers from the United States (n = 33) in 5 subject domains including math, science, English, social studies, and second language were observed. The study showed that Singapore teachers demonstrated a higher level of effectiveness than American teachers in both general teacher behaviors and differentiation strategies. The level of instructional effectiveness appeared to be positively related to the number of years of teaching experience and training in differentiation practices for the gifted.

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Journal for the Education of the Gifted. Vol. 31, No. 3, 2008, pp. 214–239.

Much of the educational reform agenda in the United States and other countries hinges on positive teacher change in respect to the use of research-based pedagogy. Expert teachers must have specific, pedagogically relevant content expertise (Shulman, 1987) that includes knowledge of how best to explicate concepts, demonstrate methods (Leinhardt & Greeno, 1986), and correct students' naive theories and misconceptions (Gardner, 1991). Recent studies on teacher effectiveness substantiate the critical role of sound teaching practices, especially higher order cognitive skills (Wenglinsky, 2000). Gifted instructional practices emphasize the importance of concept development, thinking and reasoning, problem solving, and flexible accommodations for working with gifted learners (VanTassel-Baska, 2003). Gifted learners are motivated when engaged in learning basic skills in context rather than in isolation, functioning consistently at high levels of thinking, making connections among disciplines, solving real problems, presenting products to real audiences, dealing with ambiguities, and behaving like professionals in the field (Tomlinson, 1996).

This study examined the specific teaching behaviors used by secondary teachers working with gifted learners in specialized schools in the United States and Singapore, both in respect to frequency of use and effectiveness. Cross-cultural studies have sought to identify the need for common understanding of pedagogical approaches employed and to acknowledge the role of culture in pedagogical decisions made by teachers. Data from the Third International Mathematics and Science Study (TIMSS) showed that teacher beliefs were either reflective of a behaviorist or a constructivist pedagogy (Gales & Yan, 2001). The authors asserted that genuine positive change will come about in classroom pedagogy when teachers think differently about what is going on in their classrooms and are provided with practices that provide constructivist approaches to learners. The TIMSS 1999 Video Study reinforced that classroom practices are deeply rooted in the underlying cultural values of the classroom and the wider society (Leung, 2005; Martin et al., 2000). With certain practices being embedded in the societal fabric, then the simple transplant of those practices from high-achieving countries to low-achieving countries would not work without transplanting the culture as well. Therefore, comparative cultural studies identify not only differences in educational practice but the contextual relationship interwoven between

the practice and the societal culture as well. The analysis of the video data by an expert panel reported that in East Asian classrooms more advanced content was covered and the lessons were more coherent. Furthermore, the content presentations were more developed, and students were more likely to be engaged in the lessons. Overall, the quality of teaching was judged to be high, even in teacher-directed classrooms. These classroom practices were argued to be deeply rooted in the cultural values of the East Asian classrooms and wider society (Leung, 2005). Stone (2000) researched the difference across cultures of perceived traits of gifted behavior using a survey to identify the traits. The areas of consonance most frequently found cross-culturally included learning, reasoning, problem solving, memory, inquiry, insight, high IQ, and interests. The current study extends this work by focusing on common teacher behaviors, acknowledged as valued in both U.S. and Singapore cultures. This cross-cultural study specifically sought to answer the following research questions: (a) What are the comparative teaching practices in selective secondary school classrooms in Singapore and the United States, and (b) what are the similarities and differences in teaching practices between secondary school teachers in the two cultures?

Review of the Literature

Over the last several years, there has been considerable evidence from different areas suggesting that how teachers behave in the classroom and the instructional approaches they employ significantly affect the degree that students learn. Sanders and Rivers (1996) have reported that ineffective teachers over a 3-year period have a depressed effect on student achievement in math by as much as 54%, regardless of the ability of the learner. Wenglinsky (2000) has found positive effects of using key practices such as critical thinking and metacognition on student learning in math and science across elementary and middle school levels. The literature in gifted education suggests that teacher behavior is the link to differentiated programs and services for this special population, although gifted and talented teacher behaviors are not systematically monitored.

Classroom reform is highly dependent on positive teacher behavioral change in key areas. A study of math and science programs found that teachers use strategies linked to content that show results with students (Kennedy, 1999). Collegiality and support also have been found to be necessary for classroom-based change to occur (Garet, Porter, Desimone, Birman, & Yoon, 2001). Another study has shown that the use of higher level reform behavior takes 2 or more years of intensive training to demonstrate results (Borko, Mayfield, Marion, Flexer, & Cumbo, 1997). Based on these findings, it is clear that attention to classroom-level instruction must be carefully monitored for the results employed to improve teaching.

Defining quality in teaching is difficult because it requires making value judgments where there is no clear consensus. Studying teaching cross-culturally makes this evident as behavioral expectations vary across cultures (Alexander, 2000). Joftus and Maddox-Dolan (2002) found that a strong background in both content and pedagogy were indispensable elements for producing positive teaching behaviors and student learning outcomes, a theme also echoed by Fenstermacher and Richardson (2005).

Researchers have conducted large-scale studies to examine the relationship between teachers' credentials and certifications and students' academic performance, finding positive associations. Vandevoort, Amrein-Beardsley, and Berliner (2004) found through their longitudinal studies that students in the classes of National Board Certified Teachers surpassed students in the classrooms of non-Board certified teachers in almost three quarters of the comparisons as measured by three academic performance outcome measures. They concluded that teachers identified through the assessments of the National Board for Professional Teaching Standards are, on average, more effective teachers in terms of academic achievement. Similarly, Goldhaber and Anthony (2007) found that teachers certified by the National Board for Professional Teaching Standards (NPBTS) and elementary students' achievement were positively correlated. Smith, Desimone, and Ueno (2005) found in their secondary analysis of the National Assessment of Educational Progress (NAEP) data that preparedness to teach mathematics content and participation in content-related professional development activities was associated with reform-oriented teaching.

Improving teacher quality using research-based reform principles has been an emphasis in gifted education for some time. The field has been a pioneer in advancing the introduction of innovative instructional practices such as inquiry learning, critical and creative thinking skills, higher order questioning strategies, metacognition, and the use of rich and varied curricular materials into the classroom as alternatives to sole reliance on textbooks (Tomlinson & Callahan, 1992). Most recently, the introduction of content-based curriculum tied to state and national standards and evaluated through student learning gains (VanTassel-Baska, Bass, Ries, Poland, & Avery, 1998; VanTassel-Baska, Zuo, Avery, & Little, 2002) has again positioned the field in the forefront of curriculum reform, with the emphasis on "going through the standards and not around them" to achieve instructional impact.

Method

This study is descriptive in nature, illustrating the similarities and differences of teaching practices in Singapore and the United States secondary gifted classrooms, utilizing classroom observation data collected through a validated classroom observation scale (VanTassel-Baska, Quek, & Feng, 2007). The observation scale was adapted for use in both cultural settings at the secondary school level.

Participants

Participants of this study were 67 Singapore secondary gifted class teachers and 33 American[1] selective secondary school teachers covering math, science (i.e., biology, physics, chemistry), English literature, social studies, and second language (Higher Chinese in Singapore and Latin/French in the United States). The 67 Singapore teachers were sampled from the 9th and 10th grades of six secondary schools that ran either a gifted education program or an integrated gifted education program. Both gifted programs currently coexist in Singapore. Eligibility for both programs was established at the top 1–3% of the student population. The main distinction between the programs is that the regular gifted program students are required to take a national A-level

test in order to be promoted to the next level of education, whereas the Integrated Gifted Program (IGP) students would skip the A-level testing of the system and be admitted to a junior college directly without going through national tests. The IGP provided teachers more time and flexibility in learning-oriented instructional activities, compared to Gifted Education Program (GEP) teachers at the same grade level who have to spend substantial time helping their students prepare for the national exam.[2] Teachers in both programs were recruited for teaching according to the same criteria. Because the distinction between the two programs could affect the focus of teachers' classroom instruction, the researchers deliberately selected 9th- and 10th-grade teachers as study subjects, thus avoiding the 11th-grade classrooms where preparation for exams was in greater evidence.

The 33 U.S. teachers were selected from grades 9–12 in three selective schools for gifted students where honors, AP, and IB courses were offered. The Advanced Placement (AP) program and the International Baccalaureate (IB) program represent high-level academic programs for secondary students in the United States. A wider range of grade levels were selected for observation due to the nature of programs the selected schools offered and the levels at which they occurred.

Instrumentation: The Classroom Observation Scale-Revised (COS-R)

The major instrument used in this study was The Classroom Observation Scale-Revised (COS-R; VanTassel-Baska et al., 2003), an observation scale developed in the United States setting but adapted for use in this cross-cultural study (see Appendix A for a copy of the instrument). The COS-R is a scale developed for assessing teachers' instructional practice against expectations derived from best practices in mainstream and gifted education classrooms. The instrument was developed with theoretical bases from the reform literature, general teaching practices, as well as literature in differentiation strategies; it has gone through several revisions and reiterations. The COS-R has evolved into a scale composed of 25 expected teaching behaviors subsumed under six subscales in the area of curriculum planning and delivery, accommodation for individual differences, problem-solving strategies, critical-thinking strategies, creative-thinking strategies, and research strategies. For example, there were five behavioral items

under the curriculum delivery and planning category. The teacher (1) set high expectations for student performance; (2) incorporated activities for students to apply new knowledge; (3) engaged students in planning, monitoring, or assessing their learning; (4) encouraged students to express their thoughts; and (5) had students reflect on what they had learned. The number of behavioral items under each category ranges from 3 to 5. The presence of a certain teacher's behavior is measured using a Likert scale of 1 to 3, with 1 being *not effective*, 2 being *somewhat effective*, and 3 being *effective*. Specific rubrics for each rating on the Likert scale are defined. A "not observed" option also is listed next to each behavioral item of the scale with the assumption that not every behavioral item in the COS-R will be observed in a 45–60 minute instructional period.

The internal consistency reliability for the COS-R was .91–.93 in the United States classroom settings. Subscale reliability estimates ranged from .68 to .94. The content validity established by expert review agreement using intraclass coefficient was .98 (VanTassel-Baska et al., 2007).

Behavioral indicators also were developed for each item in the scale to correspond to specific subject matter interpretations of the general behaviors and to emphasize a relevant secondary focus. These behavioral indicators were used for guiding observation ratings in the five subject domains including mathematics, science, English literature, social studies, and second language (see Figure 1 for an example).

The behavioral indicators used in Singapore classroom observations were adjusted for that cultural setting based on feedback from Ministry of Education officers as well as the gifted curriculum scope and sequence. Corresponding adjustments were made for American classrooms, using state standards and the perspectives of a core group of secondary educators for grade-level and content appropriateness.

Procedure: Training on the Use of the COS-R in Singapore

The William and Mary team conducted a one-day training on using the COS-R scale for all Ministry of Education gifted officers, National Institute of Education researchers, and graduate assistants in Singapore before observations. The training addressed the ratio-

Category: Critical Thinking Strategies				
Item: "Encouraged students to judge or evaluate situations, problems, or issues"				
Math	Science	Literature	Social Studies	Foreign/ Second Language
Ask boundary/condition questions about proof/theorem such as "Under what conditions will this proof hold up and under what conditions will it not?"	Were the results replicable? Were the data reliable? Was the experiment well-designed?	Encourage students to form interpretative hypotheses and test them on further reading or subsequent readings by applying criteria of plausibility and consistency.	Questions about the implications of context for understanding a primary source document.	Questions about an author's purpose and assumptions.

Figure 1. Examples of questions for each of the five subject areas by category and item.

Note. See a full version of the COS-R and its manual at http://www.cfge.wm.edu/athena.htm.

nale, development, and use, as well as the technical adequacy of the COS-R instrument. Participants viewed and rated two videos of Singapore secondary teachers in secondary math and social studies classes to practice how to use the form. At the training session, the training team provided explanations to Singapore raters on each of the behavioral indicators on the observation form; each rater evaluated teachers' instructional strategy use individually; and two raters were paired to discuss their ratings using the behavioral indicators to reach consensus. Trainers discussed conflicting ratings with observation team members when disagreement occurred until consensus was reached and clarity about the behavioral indicators were obtained.

Data Collection

A team method was utilized during each observation in Singapore. Each team comprised a content specialist in the Ministry of Education and one or more team members from The College of William and Mary or the National Institute of Education. There were two waves

of data collection in both Singapore and the United States classrooms. Each teacher was observed at the beginning and during the academic year of 2005. The team observed each teacher for a period of 35 to 120 minutes, scripting the lesson in detail, completing individually the COS-R form for each teacher observed, and discussing and reaching consensus with the other team member on each observation. The interrater reliability using intraclass coefficient was .74 for Singapore observers. In the United States, experienced consultants, who had been trained previously using the COS-R and had ample field experiences, conducted observations in the three selective schools independently or in pairs. The interrater reliability for the American observers was established as .89.

Data Analysis

Both descriptive and inferential statistics were employed in the analyses. Means and standard deviations were used to describe the level of effectiveness of teachers' instructional behaviors on the COS-R total and subscales. Subanalyses were conducted by subject area, teachers' background of teaching, and years of preparation in education in general and in gifted education.

Cross-cultural comparisons on the above-mentioned dimensions were conducted using analyses of variances (ANOVAs) to examine the level of instructional effectiveness between the U.S. and Singapore teachers. The choice of ANOVA rather than MANOVA, a theoretically more appropriate method, was due to the relatively low number of cases we had for the analyses (67 Singapore and 33 American teachers). We also specified a probability level of .05 due to the exploratory nature of this study. Bivariate correlation analyses also were conducted to examine the relationship between the level of instructional effectiveness and teaching and training experiences.

Results

Teacher Characteristics

The results showed that Singapore teachers were on average younger than the American teacher sample in terms of both their age and years of teaching experience. Close to three quarters of Singapore teachers (72%) were below 40, compared to 33% of American teachers in the sample; whereas less than 5% of Singapore teachers were in their 50s, close to a quarter of the U.S. teachers were in that age range (50–60). The American teachers had about 16 years of teaching experience in general compared to 10 years of teaching experience of the Singapore teachers. A great majority of the Singapore teachers were bachelor degree holders (75.8%) while the majority of the U.S. teachers were master's degree holders (71.4%). However, more than half of the Singapore teachers were trained in at least two content areas during their undergraduate studies and have been teaching in the area of their content expertise, whereas close to two thirds of the U.S. teachers (67.8%) had only one content area during their undergraduate training; only 32.2% of the U.S. teachers had two or more undergraduate content majors.

Most of the Singapore teachers were trained in gifted education (96.8%) in comparison to 51.5% of the U.S. teacher sample. In Singapore, the Gifted Branch of the Ministry of Education provides systematic training for all teachers who are recruited to teach GEP classes. In the United States, training in gifted education is more optional at the secondary level, especially as it is carried out through professional development services that a local district provides, state gifted education endorsement, and/or graduate courses in gifted education. Few or no teachers from either culture had an advanced degree in gifted education (i.e., master's degree or doctorate).

Frequency of Use of Instructional Strategies

Table 1 presents the comparative results of the frequency of employment of instructional practices based on the COS-R scale between the two cultures. Teachers from both cultures practiced four dimensions

Table 1

Singapore and U.S. Teachers' Frequency of Usage of Instructional Practices

	Singapore		U.S.	
	N	Percent	*N*	Percent
Curriculum Planning and Delivery	67	100.0	33	100.0
Accommodation for Individual Differences	67	100.0	33	100.0
Problem-Solving Strategies	43	64.0	8	24.2
Critical-Thinking Strategies	67	100.0	31	93.9
Creative-Thinking Strategies	64	95.5	31	93.9
Research Strategies	36	46.0	3	9.0

of the behavioral scales frequently (94–100%; curriculum planning and delivery, accommodation for individual differences, critical-thinking strategies, and creative-thinking strategies). Problem-solving strategies and research strategies were observed less frequently in both U.S. and Singapore classrooms; however, Singapore teachers were observed using these two strategies more frequently than the U.S. teachers (24% and 64%, and 9% and 46%, respectively).

Comparison of the Instructional Effectiveness Between the U.S. and Singapore Samples

Table 2 presents the categorical mean ratings for the Singapore and the U.S. teachers on both the subscales and the total scale of the COS-R, examining the level of teachers' instructional effectiveness. In the four dimensions that most teachers from both cultures were observed using frequently (i.e., curriculum planning and delivery, accommodation for individual differences, critical-thinking strategies, and creative-thinking strategies), Singapore teachers were rated statistically significantly higher than the U.S. teachers in curriculum delivery and planning ($F = 26.9, p = .000$), accommodation for individual differences ($F = 10.9, p = .001$), and critical-thinking strategies ($F = 20.1, p = .000$). Despite the fact that Singapore teachers also received a relatively higher mean rating on the category of creative-thinking strategies ($M = 1.8$ vs. $M = 1.6$ for U.S.), no significant dif-

Table 2

Categorical Mean Comparisons Between U.S. and Singapore Samples

	Singapore			U.S.			
	N	Mean	*SD*	*N*	Mean	*SD*	*F*
Curriculum Planning and Delivery	67	2.08	.50	33	1.57	.42	26.60**
Accommodation for Individual Differences	67	2.07	.44	33	1.74	.49	10.96*
Problem-Solving Strategies	43	1.95	.61	8	2.06	.78	.204
Critical-Thinking Strategies	67	2.00	.50	31	1.50	.53	20.13**
Creative-Thinking Strategies	64	1.82	.58	31	1.57	.61	3.56
Research Strategies	36	2.01	.61	3	2.33	.76	.77
Total	67	1.99	.44	33	1.61	.47	15.64**

Note. Total = Overall scale of COS-R. *$p < .01$; **$p < .001$.

ferences were found between Singapore and the U.S. teachers on this dimension of instructional practice ($F = 3.6$, $p = .062$). No statistically significant mean differences were found on problem solving ($p = .654$) or on research strategies ($p = .386$). Singapore teachers had an overall statistically higher mean rating on the COS-R total scale than the U.S. teachers ($F = 15.6$, $p = .000$). On a Likert scale of 1–3, Singapore teachers presented a higher level of instructional effectiveness than the U.S. teachers (.38; i.e., 1.99 – 1.61) on the total COS-R scale with an effect size *d* of .80. The range of differences on the four subscales was from .23 to .50, all favoring Singapore teachers.

Instructional Effectiveness by Subject Area

For a further examination of teachers' instructional practices in the two cultures, similar analyses were conducted by the five subject areas observed. For purposes of this analysis, fluctuations greater than .5 were considered important, while mean differences less than .5 were viewed as similar. Given the small sample size within each subject area, tests for addressing statistically significant differences were not run.

Subscale analyses showed that mean ratings on teachers' instructional practices fluctuated very little by subject domains for Singapore

Table 3

A Comparison of Instructional Practice Between Singapore and U.S. Teachers by Subject Area

	Math		Science		English		Social Studies	
	Singpr. *N* = 8–14	U.S. *N* = 7–8	Singpr. *N* = 17–27	U.S. *N* = 3–7	Singpr. *N* = 4–9	U.S. *N* = 6–8	Singpr. *N* = 4–7	U.S. *N* = 10–11
CPD	2.03 (.49)	1.58 (.42)	2.12 (.47)	1.62 (.58)	2.13 (.64)	1.88 (.36)	2.14 (.40)	1.36 (.24)
AID	2.07 (.42)	1.56 (.40)	2.09 (.45)	1.86 (.55)	2.15 (.58)	2.19 (.34)	2.08 (.30)	1.60 (.48)
PS	1.97 (.59)	2.17 (1.04)	1.97 (.73)	2.33 (.58)	-	-	2.00 (.41)	1.50 (.71)
CRI	2.14 (.46)	1.55 (.55)	2.00 (.56)	1.68 (.81)	2.03 (.64)	1.64 (.44)	2.01 (.12)	1.29 (.36)
CRE	1.65 (.50)	1.40 (.30)	1.85 (.61)	2.00 (.95)	2.08 (.78)	1.92 (.53)	1.71 (.42)	1.31 (.41)
RS	1.47 (.40)	-	2.14 (.54)	2.33 (.76)	2.23 (.97)	-	2.17 (.55)	-
Total	1.91 (.35)	1.56 (.42)	2.03 (.46)	1.74 (.49)	2.09 (.64)	2.06 (.77)	2.00 (.21)	1.51 (.53)

Note. Singpr. = Singapore; CPD = Curriculum Planning and Delivery; AID = Accommodation for Individual Differences; PS = Problem-Solving Strategies; CRI = Critical-Thinking Strategies; CRE = Creative-Thinking Strategies; RS = Research Strategies; Total = Overall Scale of COS-R.

teachers. The mean rating differences between Singapore and U.S. teachers across subject areas were small in curriculum planning and development (< .17), accommodation for individual differences (< .08), critical-thinking strategies (< .14), and moderate in creative-thinking strategies (.43). By-subject analyses for the U.S. teachers appeared to demonstrate greater variations in the sample, with mean rating differences fluctuating in curriculum planning and delivery (< .62), accommodation for individual differences (< .63), critical-thinking strategies (< .39), and creative-thinking strategies (< .69; see Table 3).

The Relationship Between Instructional Effectiveness and Teaching and Training Experiences

The level of instructional effectiveness also was analyzed against the years of teaching experience in both teacher samples. The results showed some differences between the Singapore and the U.S. sample. For Singapore teachers, those who had more years of teaching experience received higher mean ratings on both the subscales and the total scale of the COS-R. Teachers who have taught more than 16 years had the highest ratings in all dimensions, followed closely by teachers who had between 11–15 years of teaching experience.

For teachers who taught for 10 years or less, the number of years did not seem to make much difference on their employment of two clusters of strategies (i.e., curriculum planning and delivery and accommodation for individual differences). However, for the use of critical- and creative-thinking skills and research strategies, the number of years of teaching experience again mattered, with more experienced teachers (6–10 years) exhibiting higher levels of effective usage of these strategies than teachers who had less teaching experience (≤ 5 yrs). The overall rating on the COS-R scale suggested that experienced teachers demonstrated a higher level of effectiveness in employing important instructional strategies for gifted learners in Singapore (see Table 4). For the U.S. sample, however, no clear pattern was found between instructional effectiveness and years of teaching experience.

Bivariate correlation analyses, using the Pearson product moment correlation coefficient, suggested that there was a statistically significant positive correlation ($p < .05$) between the general teaching experience and the level of effectiveness in using critical-thinking strategies ($r = .261$), in using research strategies ($r = .414$), and the overall instructional strategies usage ($r = .266$) for the Singapore sample.

Instructional Effectiveness on Curriculum Differentiation by Practicum Experience

Unique to the Singapore sample was that all teachers of gifted students were expected to go through a practicum on curriculum differentiation. Table 5 presents the means and standard deviations of

Table 4

Categorical Means by Years of Teaching for Singapore Teachers

	5 Years or Less			6–10 Years			11–15 Years			16 Years and Above		
	N	Mean	*SD*	*N*	Mean	*SD*	*N*	Mean	*SD*	*N*	Mean	*SD*
Curriculum Planning and Delivery	10	1.98	.46	24	1.99	.52	19	2.18	.49	9	2.22	.53
Accommodation for Individual Differences	10	1.97	.49	24	1.99	.48	19	2.16	.39	9	2.15	.44
Problem-Solving Strategies	4	1.96	.28	15	1.75	.73	14	1.95	.48	7	2.36	.48
Critical-Thinking Strategies	10	1.79	.47	24	1.93	.51	19	2.09	.46	9	2.19	.48
Creative-Thinking Strategies	10	1.64	.55	23	1.81	.65	18	1.86	.56	8	1.92	.60
Research Strategies	6	1.50	.46	14	2.00	.69	10	2.14	.58	4	2.44	.32
Total	10	1.81	.42	24	1.92	.47	19	2.08	.41	9	2.17	.44

Note. Total = Overall scale of COS-R.

the teachers' ratings, comparing those who completed the differentiation practicum to those who did not. The data clearly showed that those who completed the practicum demonstrated higher levels of effectiveness in using all dimensions of instructional strategies than teachers who did not complete the practicum. The only exception was in the area of research strategies where the two groups of teachers received equally high mean ratings. The differences on the level of instructional effectiveness registered statistical significance in curriculum planning and delivery ($F = 5.57$, $p < .05$), critical-thinking strategies ($F = 5.74$, $p < .05$), as well as on the total COS-R scale ($F = 4.39$, $p < .05$), favoring those who completed the practicum on curriculum differentiation.

Table 5

Categorical Means by Practicum on Differentiation—Singapore

	Yes			No			
	N	Mean	*SD*	*N*	Mean	*SD*	*F*
Curriculum Planning and Delivery	27	2.26	.49	33	1.97	.47	5.57*
Accommodation for Individual Differences	27	2.17	.43	33	1.99	.45	2.39
Problem-Solving Strategies	18	2.09	.50	21	1.86	.65	1.56
Critical-Thinking Strategies	27	2.17	.44	33	1.88	.49	5.74*
Creative-Thinking Strategies	25	1.96	.54	32	1.71	.61	2.46
Research Strategies	16	1.99	.65	17	2.02	.65	.01
Total	27	2.13	.42	33	1.89	.43	4.39*

Note. Total = Overall scale of COS-R. *$p < .05$.

Discussion

This cross-cultural study of secondary gifted classroom teachers' instructional practice suggested that Singapore teachers were better prepared in both content knowledge and gifted education despite a lack of advanced degrees (e.g., master's degree or doctorate). Both the Singapore and the U.S. teachers demonstrated frequent employment of curriculum delivery and planning, accommodation for individual differences, critical-thinking strategies, and creative-thinking strategies in their instructional practice. However, Singapore teachers demonstrated more frequent, as well as more effective, use of these strategies than U.S. teachers did. This finding may not be surprising, given several factors: Singapore secondary teachers are selected for teaching in programs for the gifted based on content expertise as judged by grades at the undergraduate level, while U.S. teachers are selected according to a number of criteria such as recommendations, degree level, teaching experience, and so forth. Grades may not even be considered. Secondly, Singapore teachers receive systematic training in gifted education across the years, culminating in differentiated

practice. No comparable training model exists for the U.S. sample. Thirdly, the emphasis on instructional delivery in Singapore classrooms is stronger than in the U.S., where teachers also often design their own curriculum as well as deliver it. Lastly, the lack of effective monitoring of curriculum implementation has been an ongoing problem in U.S. classrooms, not exclusively in gifted education (Carroll, Krop, Arkes, Morrison, & Flanagan, 2006; Clune, 1993; Goodlad, 1981). The level of support for teacher implementation of differentiated practice is clearly much stronger in Singapore where Ministry of Education staff work closely and regularly with these specialized teachers. No instructional supports in the U.S. are comparable in intensity although each specialized school vests principals and curriculum directors with this responsibility.

The study suggested that there was an underutilization of problem solving and research strategies by teachers in both cultures. Less frequent use of these strategies might be related to the "snap shot" nature of the observation method employed in the study, whereas two observations were conducted instead of a broader spectrum of multiple observations. The employment of research strategies are more related to a specific period of instructional time when research is the major focus of the instruction. Moreover, the lack of frequent employment of the problem-solving strategies in both cultures also might be attributed to the relatively stringent nature of the rating criteria for the subscale, whereas behaviors receiving credit needed to be in concert with the intentional use of a research-based problem-solving model. Such a finding in this cross-cultural study was consistent with the finding of another study conducted in the United States (VanTassel-Baska, Feng, Brown, & Bracken, in press), although a less-frequent employment of the two types of instructional strategies were observed being used in elementary classrooms.

The study also showed that teaching experience was related to instructional effectiveness. More years of teaching experience, in general, yielded higher mean scores on teaching behaviors. More than 10 years of gifted teaching experience specifically translated into higher ratings. Such a relationship was particularly evident in the Singapore teacher sample.

Systematic training on differentiation appeared to have a positive impact on teachers' employment of an array of differentiation strate-

gies in their classroom instruction. The comparative results from the Singapore teacher sample between those who received training and those who did not substantiate such a claim. This finding is consistent with studies suggesting that training in differentiation practices enhances teacher performance in the use of effective learning strategies (Hansen & Feldhusen, 1994; VanTassel-Baska et al., in press).

There are several limitations to this study when interpreting the comparative results. First, there was a lack of sample comparability based on student selection. Gifted student selection approaches for selective schools in Singapore would include tests of English language, mathematics reasoning, and a general ability assessment tool, representing the top 3% of the Singapore student population. Criteria for selection in the U.S. sample included ability, achievement, teachers' recommendations and, in some instances, interviews. Selected students would be in the range of the top 5% within a given region or district.

There also was a lack of sample comparability based on school context variables. We intentionally selected different grade levels of secondary classrooms from the two cultures in order to focus on strategies used with relatively homogeneous groups of identified gifted students. Grade-level differences reflected are indications of different levels of programming for gifted learners in selective schools in the United States. Many of these schools in the United States serve gifted students only at grades 11–12. Gifted Singapore students across grades 9–10 attend only one school, whereas at grades 11–12 they are split. Moreover, five out of six (83.3%) Singapore sample schools were single-sex schools, whereas all sample schools from the United States were coeducational schools. Furthermore, there was a lack of comparability regarding program administration, with the Singapore sample being closely monitored by subject matter specialists from the Ministry of Education versus limited monitoring in United States schools; typically, monitoring in the U.S. schools is done at the school level and focused on general issues of teaching, not the use of differentiated practices.

The study also was limited by using different observer rating procedures. A team method, pairing a specialist officer from the Gifted Branch of the Ministry of Education with a researcher or a graduate student, was used in the Singapore classroom observations. Although

the interrater reliability on the use of the COS-R in the Singapore sites was acceptable (.74), some variations among raters by subject area were noted and could have influenced differences observed within those areas. The U.S. observations were conducted mainly by one experienced rater who was very proficient in using the instrument and who had many field experiences in using the COS-R in elementary and secondary classroom observations.

Despite these limitations, evidence suggested that Singapore and United States teachers were very similar in recognizing what constitutes important aspects of exemplary teaching and the challenges of differentiation in a student body with a range of ability differences in different subject areas. In an interview study with exemplary teachers from both cultures (VanTassel-Baska, MacFarlane, & Feng, 2006), it was found that teachers cited very similar differentiation practices deemed important in their teaching practice. Findings from this cross-cultural study thus provide a new lens through which we can examine instructional practices in different cultures.

Implications

The study has several implications for educators in Singapore. First, there is a need for a continued focus on the systematic professional development of teachers of the gifted, in appropriate pedagogy in specific targeted areas. The Singapore findings showed that the level of effective usage of differentiated strategies was positively related to training experience in gifted education. School-based instructional leadership to provide active support for teachers of the gifted should continue to be encouraged and facilitated. Moreover, support of the differentiation practices in school-based gifted education for teachers in targeted schools is of particular importance and should continue after the first 2 years of foundational professional development in gifted education. Finally, there is a need to encourage a culture of reflective practice among Singapore teachers. Specifically, the classroom observations and postlesson discussions offered a deeper understanding and meaning-making of what constituted best and effective practice in the classroom.

In terms of implications for the United States, there are two broad areas. First, there is a need for greater emphasis on targeted professional development experiences by subject-appropriate level that would enhance learning for gifted students. Second, there is a need for a technical assistance model in selective secondary schools that provides continued growth for teachers in differentiated practices. It was clear from these data that the preparation of Singapore teachers to work with gifted learners was much more deliberate than in the United States and that monitoring of instructional practice was much more routine. If the U.S. wants to improve practice in gifted education, then these features will need greater attention.

Although each culture faces its own unique challenges in teaching practices, our data suggested that teaching practice appeared to be a more universal exercise of mind and methods. Teachers from both cultures appeared to embrace strikingly similar beliefs about what the best teaching practices are and what constitutes exemplary teachers. Such results suggest that the educational research community might be able to identify and establish an array of core best practices that can be universally applied to selective secondary schools worldwide. More research in other cultures is needed, however, to validate such a premise.

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End Notes

[1]A total of 42 U.S. teachers were observed, among which 33 were observed twice. Hence, 33 cases were used in the analysis.

[2] In Singapore, the movement toward eliminating the A-level testing for many gifted students is a large concession to the gifted program and a step forward in rethinking curriculum reform as the need to engage in more interdisciplinary work with secondary students, using pedagogy such as problem-based learning and concept development. It also represents a movement toward greater inclusion of the percentage of secondary students served in the gifted program, from 1% to 3%.

Appendix A
The William and Mary Classroom Observation Scales, Revised Teacher Observation

Joyce VanTassel-Baska, Ed.D.
Jeanne Struck, Ph.D.
Bruce Bracken, Ph.D.
Tamra Stambaugh, M.Ed.
Linda Avery, Ph.D.
Annie Feng, Ed.D.
Dianne Drummond, M.Ed.

Directions: Please employ the following scale as you rate each of the checklist items. Rate each item according to how well the teacher characteristic or behavior was demonstrated during the observed instructional activity. Each item is judged on an individual, self-contained basis, regardless of its relationship to an overall set of behaviors relevant to the cluster heading.

3 = Effective	2 = Somewhat Effective	1 = Ineffective	N/O = Not Observed
The teacher evidenced careful planning and classroom flexibility in implementation of the behavior, eliciting many appropriate student responses. The teacher was clear, and sustained focus on the purposes of learning.	The teacher evidenced some planning and/or classroom flexibility in implementation of the behavior, eliciting some appropriate student responses. The teacher was sometimes clear and focused on the purposes of learning.	The teacher evidenced little or no planning and/or classroom flexibility in implementation of the behavior, eliciting minimal appropriate student responses. The teacher was unclear and unfocused regarding the purpose of learning.	The listed behavior was not demonstrated during the time of the observation. (NOTE: There must be an obvious attempt made for the certain behavior to be rated "ineffective" instead of "not observed".)

General Teaching Behaviors				
Curriculum Planning and Delivery	3	2	1	N/O
The teacher . . .				
1. set high expectations for student performance.				
2. incorporated activities for students to apply new knowledge.				
3. engaged students in planning, monitoring or assessing their learning.				
4. encouraged students to express their thoughts.				
5. had students reflect on what they had learned.				
Comments:				

Differentiated Teaching Behaviors				
Accommodations for Individual Differences	**3**	**2**	**1**	**N/O**
The teacher . . .				
6. provided opportunities for independent or group learning to promote depth in understanding content.				
7. accommodated individual or subgroup differences (e.g., through individual conferencing, student or teacher choice in material selection and task assignments).				
8. encouraged multiple interpretations of events and situations.				
9. allowed students to discover key ideas individually through structured activities and/or questions.				
Comments:				
Problem Solving	**3**	**2**	**1**	**N/O**
The teacher . . .				
10. employed brainstorming techniques.				
11. engaged students in problem identification and definition.				
12. engaged students in solution-finding activities and comprehensive solution articulation.				
Comments:				
Critical-Thinking Strategies	**3**	**2**	**1**	**N/O**
The teacher . . .				
13. encouraged students to judge or evaluate situations, problems, or issues.				
14. engaged students in comparing and contrasting ideas (e.g., analyze generated ideas).				
15. provided opportunities for students to generalize from concrete data or information to the abstract.				
16. encouraged student synthesis or summary of information within or across disciplines.				
Comments:				
Creative-Thinking Strategies	**3**	**2**	**1**	**N/O**
The teacher . . .				
17. solicited many diverse thoughts about issues or ideas.				
18. engaged students in the exploration of diverse points of view to reframe ideas.				
19. encouraged students to demonstrate open-mindedness and tolerance of imaginative, sometimes playful solutions to problems.				
20. provided opportunities for students to develop and elaborate on their ideas.				
Comments:				

Research Strategies	3	2	1	N/O
(It is atypical for these to be observed in one session. Some teachers, however, may use Items #21–25 within a single period to illustrate the full research process to students. Please note those observations in the comments section.)				
The teacher . . .				
21. required students to gather evidence from multiple sources through research-based techniques (e.g., print, nonprint, Internet, self-investigation via surveys, interviews, etc.).				
22. provided opportunities for students to analyze data and represent it in appropriate charts, graphs, or tables.				
23. asked questions to assist students in making inferences from data and drawing conclusions.				
24. encouraged students to determine implications and consequences of findings.				
25. provided time for students to communicate research study findings to relevant audiences in a formal report and/or presentation.				
Comments:				
Additional Comments:				