GIFTED AND GENERAL HIGH SCHOOL STUDENTS' PERCEPTIONS OF CLASSROOM QUALITY IN KOREA AND THE UNITED STATES

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Objectives

The purposes of this study are to investigate whether differences between gifted and general students' perceptions toward their classes exist, and whether there are differences between Korean and American students using a translated Korean version of the Student Perceptions of Classroom Quality (*SPOCQ*) instrument. Research questions in this study are as follows:

1. Do the original English version of the SPOCQ and the Korean version of the SPOCQ have equivalent constructs?

2. Are there differences in perceptions of classroom quality between gifted high school students and general high school students in Korea and the U.S.?

Literature Review

The five constructs of the SPOCQ

Research related to SPOCQ constructs supported the importance of appeal, challenge, choice, meaningfulness, and self-efficacy in learning. The first construct, appeal, had a positive relationship with achievement (Beaton et al., 1996; Brezovsky, 2002; Pell, 1985; Schiefele & Csikszentmihalyi, 1995). When students experienced appeal in learning, they tended to learn with mastery goal orientation and intrinsic motivation (Barron & Harackiewicz, 2001; Lee, Sheldon, & Turban, 2003; Schiefele & Csikszentmihalyi, 1995). With appeal, students also experienced more effective and in-depth comprehension with positive attitudes toward school (Brezovsky, 2002; Lee, Sheldon, & Turban, 2003; Schiefele & Krapp, 1996; Shirey & Reynolds, 1988; Tobias, 1995). The second construct, challenge, positively related to achievement (Bandura & Schunk, 1981; Simons & Klein, 2007), intrinsic motivation (Lutz, Guthrie, & Davis, 2006; Turner, Meyer, Cox, Logan, DiCintio & Thomas, 1998), self-efficacy (Bandura & Schunk, 1981; Lutz, Guthrie, & Davis, 2006), and involvement in class (Turner, Meyer, Cox, Logan, DiCintio & Thomas, 1998). The studies supported the importance of appropriate levels of challenge in learning, which

encourages students' engagement and achievement in class. The third construct, choice, also influences learning. Providing choice in the process of academic instruction encourages students to learn conceptually rather than mechanically (Grolnick & Ryan, 1987). Similar to the other SPOCQ constructs, choice relates to achievement (Camahalan, 2006; Cordova & Lepper, 1996; Flink, Boggiano, & Barrett, 1990) and positive self-beliefs (Marcou & Philippou, 2005; Pintrich & DeGroot, 1990; Young, 2005). Therefore, allowing students to choose activities based on their interest areas or utilize their preferred learning styles should be emphasized in order to increase performance and self-confidence. The fourth construct, meaningfulness, is another important factor for assessing student perception toward classes. When students learned with meaningful tasks, they engaged in learning actively with joy (Hmelo-Silver, 2000; Sobral, 1995), performed better (Breton, 1999; Bulte, Westbroek, De Jong, & Pilot, 2006; Gallagher, Stepien, & Rosenthal, 1992; Sobral, 1995), and acquired and retained knowledge accurately and efficiently (Breton, 1999; Dods, 1997; Hmelo-Silver, 1998, 2000). Since meaningfulness plays an important role in learning, students' perceptions in terms of meaningfulness in the classroom needs to be embedded. Lastly, a relationship existed between the fifth construct, academic self-efficacy, and achievement and adjustment in school. Academic self-efficacy played both a direct and indirect role in predicting students' achievement (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996a; Barkley, 2006; Chemers, Hu, & Garcia, 2001; Lent, Brown, & Larkin, 1984; Pajares, 1996; Pajares & Miller, 1994; Zimmerman, Bandura, & Martinez-Pons, 1992), and academic self-efficacy related to students' school adjustment and endurance (Chemers, Hu, & Garcia, 2001; Lent, Brown, & Larkin; 1984). Understanding students' perceptions of their classrooms through these five factors would provide educators with insight as to whether students are satisfied with their learning activities and what aspects of teacher instruction require reform to promote optimal student learning.

The U.S. and the Korean students' perceptions of their classroom

Researchers indicated that American students often need more appeal, challenge, choice, and meaningfulness factors in their classes (Gentry, Gable, & Springer, 2000; Gentry, Rizza, & Gable, 2001). When students move to higher grade levels, they did not perceive enough appeal, challenge, choice, meaningfulness in learning (Gentry, Gable, & Rizza, 2002). Gifted students tended to have similar views toward their classes, indicating that students sometimes experience interest, challenge, and enjoyable activities, but they need more choices (Gentry, Gable, & Springer, 2000). Gentry, Rizza, and Owen's (2002) study articulated the importance of assessing students' perceptions of their classes, indicating the differences between student and teacher understanding of classroom instruction. Although teachers believed they provided adequately appealing, challenging, autonomous, meaningful, and self-efficacy-increasing environments, this view greatly differed from student observations about their classes.

Korean general students' reports also showed that this group of learners needs more interesting, challenging, autonomous, and intrinsicly motivated learning opportunities (Kim, Namgung, & Kim, 2006). Students in the gifted high school, however, reported that they had opportunities to be autonomous learners and experienced challenge in some classes (Park, 2005; Park & Seo, 2005). Although partial classroom satisfaction existed for Korean gifted students, an important next step is to evaluate student perceptions with an instrument that provides valid, reliable information that may be used to elevate the Korean gifted educational environment to an optimal level,. Therefore, using the SPOCQ instrument to investigate students' perceptions based on appeal, challenge, choice, meaningfulness, and academic self-efficacy factors may help Korean educators learn more about how students perceive their academic environments. These findings may help Korean educators improve learning experiences for secondary students.

Methods

For this study, a causal–comparative design and quantitative methods were used. To examine the research questions, Multi-sample Confirmatory Factor Analysis (MCFA), Multivariate Analysis of Variance (MANOVA) and Discriminant Factor Analysis (DFA) were used to compare perceptions of classroom quality between gifted and general students' in Korea and the U.S.

Participants

Two hundred and twenty one Korean students in gifted high schools participated in this study: 128 students (74 10^{th} graders and 54 11^{th} graders) from a foreign language high school (FLHS) and 93 students (42 10^{th} graders and 51 11^{th} graders) from a science academy (SA) in Korea. In addition to gifted students, general students sampled in data from previous research (Chae & Gentry, 2007) were used for this study. Participants in the previous study included 713 students from two general high schools in Seoul and one general high school in Ku-mi, a medium-sized city. The general student sample for this study consisted of 34% girls and 66% boys. The U.S. sample consisted of 7,411 secondary school students in seven states (Connecticut, Florida, Michigan, Minnesota, New York, Texas, and Wisconsin) and one foreign country, ranging from 7th to 12th graders. For this study, the American sample was randomly selected from 10^{th} and 11^{th} grade students to be the same size as the Korean sample. Therefore, both the general and gifted U.S. student samples included 220 and 221 students respectively, parallel to the Korean sample.

Instrument

The original version of the SPOCQ. The original SPOCQ instrument was developed by Gentry & Owen (2004). The validation study included the sample of 7,411 students in grades 7 to 12. The sample included students in rural, urban, and suburban middle schools (n = 12) and high

schools (n = 14) in seven states (Connecticut, Florida, Michigan, Minnesota, New York, Texas, and Wisconsin) and one foreign country. The original SPOCQ instrument consisted of factors with 34 items: appeal (7 items), challenge (7 items), choice (7 items), meaningfulness (5 items), and academic self-efficacy (8 items) using a 5-point Likert scale of 5=strongly agree to 1=strongly disagree. The instrument has been shown to be valid and reliable. To obtain construct validity evidence, the researchers performed confirmatory factor analysis (CFA). The results of the CFA showed that SPOCQ has evidence of good model fit: Root Mean Square Error of Approximation (RMSEA) = 0.051 and Comparative Fit Index (CFI) = 0.997. Factor loadings ranged from .71 to .90. The internal consistency estimates were also judged good for an affective measure (Gable & Wolf, 1993). Internal consistency reliability estimates using SPSS 12.0 were as follows: appeal (.85), challenge (.81), choice (.81), meaningfulness (.81), and academic self-efficacy (.82). The five subscales showed substantial correlations among factors.

The Korean version of the SPOCQ. The translated Korean language SPOCQ differs slightly from the original measure (Chae & Gentry, 2007). It has the same five factors as the American but the items differ. The Korean SPOCQ has 32 items: appeal (7), challenge (5 items), choice (7 items), meaningfulness (5 items), and academic self-efficacy (8 items). The validation study of the Korean SPOCQ by Chae and Gentry included 714 Korean students from three general high schools (53.6 % girls): two girls' high schools in Seoul and one boy's high school in Ku-Mi, a middle sized city. Since the results of the CFA showed that two items (items #33 and #27) from the challenge factor had low factor loadings below .30 (-0.13 and 0.19), deleting these two items resulted in constructing the 5 factor and 32 item model. When the CFA was repeated on the revised item set using LISREL 8.73 (Jöreskog & Sörbom, 2005), the indices showed a good model fit: Chi-Square = 2690.68 ($p<.0001$), Root Mean Square Error of Approximation (RMSEA) = 0.086, Normed Fit Index (NFI) = 0.93, Non-Normed Fit Index (NNFI) = 0.93,

Comparative Fit Index (CFI) = 0.94, Goodness of Fit Index (GFI) = 0.80, and Root Mean square Residual (RMR) = 0.086. Loadings of all items were greater than 0.35. According to Gable & Wolf's (1993) suggestions, the internal consistency estimates were judged good for an affective measure with alpha reliablility coefficients above .70. SPSS 12.0 was used to estimate alpha reliability coefficients. The alpha reliability estimates ranged from .75 to .85 on the 32 item revised SPOCQ: appeal (.85), challenge (.75), choice (.81), meaningfulness (.83), and academic self-efficacy (.84). Similar to the original English version SPOCQ, the Korean version SPOCQ also resulted in high correlations among factors.

Results and Conclusions

The internal consistency reliability estimates and CFA analysis demonstrated that the Korean version of SPOCQ can be used reliably and validly with Korean and U.S. student data to assess students' perception of classroom. Prior to comparing the classroom perceptions between Korean and U.S. groups and between gifted and general students groups, multi-group confirmatory factor analysis (MCFA) was employed to confirm whether the Korean and U.S. versions of SPOCQ had equivalence. The results showed same structures existed between Korean and U.S. groups for SPOCQ data (Table 1). However, on factor loadings partial invariance existed across groups, showing differences on 7 out of 32 items: Two items on the Appeal subscale, two items on the Choice subscale, one item on the Meaningfulness subscale, and two items on the Academic Self-Efficacy subscale (Table 2).

Table 1

MCFA Results

Model Tested	χ^2 (df)	$\Delta\chi^2$ (Δdf)	RMSEA	CFI	NNFI
Korean Sample	2065.38 (454)		.091	.94	.94
U.S. Sample	2566.03 (454)		.011	.93	.93
Baseline Model for Factor loading Invariant (Model 1)	4629.9151 (908)		.099	.94	.93
Factor Loading Invariant (Model 2)	4796.9786 (935)	167.064 (27)**	.010	.93	.93
Baseline Model for Error Variance (Model 3)	4836.0223 (927)		.010	.93	.92
Error Variance Invariant (Model 4)	5094.8860 (952)	258.864 (5)**	.010	.93	.93

** $p <$ .01

Table 2

Non-Invariant Variables for Factor Loading

Factor	Variables	
APP	2	The assigned reading material for my class is interesting.
APP	6	I find the reading material for my class a pleasure to read.
CHO	2	My teacher lets me choose the resources I use for projects.
CHO	4	I am given lots of choices in my class.

Factor	Variables	
MEA	5	I can relate the material discussed in my class to my daily life
SE	2	I am good at connecting material from this class with the real world.
SE	7	I can express my opinions clearly in this class.

Note. APP= Appeal, CHA=Challenge, CHO=Choice, MEA=Meaningfulness, SE= Self-Efficacy

Then, using 2×2 MANOVA (nationality × giftedness), the differences between Korean and U.S. groups and between gifted and general student groups on five SPOCQ subscales were investigated. A 2×2 (giftedness by nationality) MANOVA was used to examine the differences on perceptions of classroom quality among giftedness and nationality, using giftedness status and nationality as independent variables and the five SPOCQ factors as dependent variables. Statistically significant main effects for giftedness (*Wilks' λ* = .952, $F_{5, 873}$=8.884, p<.0001, *partial* η^2=.048) and for nationality (*Wilks' λ* =.520, $F_{5, 873}$=161.124, p <.0001, *partial* η^2=.48) existed with a medium and a large effect size, respectively. There was an interaction effect with a medium effect size (*Wilks' λ* =.936, $F_{5, 873}$=11.989, p <.0001, *partial* η^2=.064) (Cohen, 1988). The effect sizes indicated that 4.8% of the total SPOCQ score variation can be accounted by the main effect for giftedness, and 48% of the total SPOCQ score variation can be accounted by the main effect for nationality. A moderate relationship existed between giftedness and nationality.

As a next step, simple effects (multivariate tests) within each group were examined because there was an interaction effect between giftedness and nationality (Huberty & Olejnik, 2006). First, the differences between Korean and U.S. students within the gifted groups were examined. The result indicated that statistically significant differences between Korean and U.S. students within the gifted groups existed with a medium-large effect size (*Wilks' λ* = .752, $F_{5, 873}$=57.644, p<.001, η^2 = .248). Then, the differences between Korean and U.S. students in the

general groups were sought. Statistically significant differences existed between Korean and U.S. students in the general student groups with a large effect size (*Wilks' λ* = .602, $F_{5, 873}$=115.368, p<.001, η^2 = .398).

Further, the differences between gifted students and general students within each nationality were examined. The examination between gifted and general students in the Korean group suggested that statistically significant differences existed with a medium effect size (*Wilks' λ* = .640, $F_{5, 873}$=11.125, p< .001, η^2= .060). Next, differences between gifted and general students within the U.S. group were examined. Significant differences existed between American gifted and general student groups with medium effect size (*Wilks' λ* = .948, $F_{5, 873}$=9.647, p< .0001, η^2= .052). Results of the simple effects are given in Table 3.

Table 3

Simple Effects: Multivariate Tests of Significance

Test Name	*Wilks' λ*	*F*	*df1*	*df2*	*p*	η^2
Nationality within Gifted Group	.752	57.644	5	873	<.001	.248
Nationality within General Group	.602	115.368	5	873	<.001	.398
Giftedness within Korean Group	.940	11.125	5	873	<.001	.060
Giftedness within U.S. Group	.948	9.647	5	873	<.001	.052

To clarify the MANOVA results, a discriminant function analysis (DFA) was conducted to examine variables that discriminated between gifted and general student groups, as well as between Korean and U.S. student groups. The results of the first DFA regarding the gifted and general groups showed that the two groups were statistically significantly separated (*Wilks' λ* = .956, χ^2=39.484, *df* = 5, p<.001). The canonical correlation was .210, which represented a small effect size according to Cohen's (1988) suggestion: squared values between 2% and 12.99% as

small effect sizes, 13% and 25.99% as medium effect sizes, and 26% or higher as large effect sizes. The canonical correlation value indicated that 4.41 % of the variation in the construct can be explained by giftedness. The DFA results are presented in Table 4.

Table 4

Wilks' Lamda and Canonical Correlation for Two Groups

Function	*Wilks' λ*	χ^2	*df*	*p*	Cannonical Correlation (R_c)	R_c^2
1	.956	39.484	5	<.001	.210	4.41 %

The result of the group mean equality test between gifted and general groups indicated that scores on the four factors, Appeal (*Wilks' λ* = .993, $F_{1, 879}$=5.932, *p*= .015), Challenge (*Wilks' λ* = .965, $F_{1, 879}$=31.809, *p*<.001), Choice (*Wilks' λ* = .983, $F_{1, 879}$=15.536, *p*<.001), and Academic Self-Efficacy (*Wilks' λ* = .991, $F_{1, 879}$=8.058, *p*=.005) were significant predictors of group status. In other words, significant differences existed between the gifted and general student groups on the means of the four subscales. Table 5 represents the findings about the mean differences on the five scales.

Table 5

Test of Equality of Group Mean Between Gifted and General Students

Variables	*F*	*Wilks' λ*	*df1*	*df2*	*p*
Appeal	5.932	.993	1	879	.015
Challenge	31.809	.965	1	879	<.001
Choice	15.536	.983	1	879	<.001
Meaningfulness	.879	.999	1	879	.349
Academic Self-Efficacy	8.058	.991	1	879	.005

In addition to the mean differences tests between gifted and general groups on each SPOCQ subscale, the variables contributing to group differences were examined by calculating

standardized discriminant function coefficients and structure coefficients. The standardized discriminant function coefficients for 5 factors were as follows: Challenge (.959), Meaningfulness (-.483), Choice (.482), Appeal (-.197) and Academic Self-Efficacy (-.005). The results showed that the Challenge factor made high contribution and the Meaningfulness and Choice factors made moderately high contribution to discriminate between gifted and general groups, according to Marcoulides's (1997) suggestion that absolute values of .7 or .8 are considered as high or significant contributions, and values larger than .3 are considered as moderate high contributions.

The structure coefficients of each variable represented a different order from the variables of standardized discriminant function coefficients, showing relationships between the variables and discriminant function. Challenge factor still had the highest relationship (.886), and Choice (.619), Academic Self-Efficacy (.446), and Appeal (.383) factors were also strong predictors. The standardized discriminant function coefficients and structure coefficients of each variable are represented in Table 6. The classification result indicated that overall 60.6% of the sample was classified correctly. DFA predicted the gifted group somewhat more correctly (63.7%) than the general group (57.5%).

Table 6

Standardized Discriminant Function Coefficients and Structure Coefficients: DFA for Giftedness

	Standardized Discriminant Function Coefficients	Structure Coefficients
Appeal	-.197	.383
Challenge	.959	.886
Choice	.482	.619
Meaningfulness	-.483	.147
Academic Self-Efficacy	-.005	.446

Next, DFA between Korean and U.S. groups was conducted. A statistically significant result was found, which demonstrated significant separation between Korean and U.S. student groups (*Wilks' λ* = .530, χ^2=557.079, *df* = 5, *p*<.001) with a large effect size (R_c =.686) (Cohen, 1988). 47.1% of the variance was explained by nationality (R_c^2=0.471). Table 7 includes the DFA findings.

Table 7

Wilks' Lamda and Canonical Correlation between Korean and U.S. Groups

Function	*Wilks' λ*	χ^2	*df*	*p*	Cannonical Correlation (R_c)	R_c^2
1	.530	557.079	5	<.001	.686	47.1 %

The DFA result of group mean difference test indicated that all five subscales played roles of significant predictors of nationality. That is, significant differences existed on the means of the five subscales between Korean and U.S. student groups (See Table 8).

Table 8

Test of Equality of Group Mean Between Korean and U.S. Students

Variables	*F*	*Wilks' λ*	*df1*	*df2*	*p*
Appeal	9.631	.989	1	879	.002
Challenge	14.713	.984	1	879	<.001
Choice	300.456	.745	1	879	<.001
Meaningfulness	110.006	.889	1	879	<.001
Academic Self-Efficacy	77.206	.919	1	879	<.001

The variables that influenced the group differences were examined by calculating standardized discriminant function coefficients and structure coefficients. The five variables' standardized canonical discriminant function coefficients in descending order were as follows: Appeal (-1.170), Choice (1.044), Meaningfulness (.365), Academic Self-Efficacy (.296), and

Challenge (-.057). Appeal was the strongest variable that discriminated nationality, followed by Choice and Meaningfulness, which were higher than .3 in an absolute value (Marcoulides, 1997). The descending order of structure coefficients (correlation coefficients with the function) differed from those of standardized discriminant function coefficients. Appeal had the strongest relationship (.620), and Challenge (.375) and Choice (.314) indicated moderately strong relationships that were greater than .30. The standardized discriminant function coefficients and structure coefficients are reported in Table 9.

Table 9

Standardized Discriminant Function Coefficients and Structure Coefficients: DFA for Nationality

	Standardized Discriminant Function Coefficients	Structure Coefficients
Apeeal	-1.170	.620
Challenge	-.057	.375
Choice	1.044	.314
Meaningfulness	.365	.137
Academic Self-Efficacy	.296	-.111

The DFA result showed that overall 83.1% of the sample was classified correctly. The predictions for both groups were good: 85.9% of U.S. group and 80.3% of Korean group membership were classified correctly, showing more accuracy for the American group.

Significance of the study

This study can be understood as one example which includes all necessary steps for examining differences across cultures. For an accurate comparison, measurement equivalence investigation was conducted prior to examining differences between gifted and general student groups and between Korean and U.S. groups. Based on the results that the two different language version instruments had the same constructs and partial invariance on factor loadings, the

differences between the groups were examined. It is meaningful that the current study was the first cross-cultural study using the SPOCQ instrument, which included evaluation of measurement equivalence. This study can serve as an example of necessary steps for a cross-cultural study in which instruments have been translated. More cross-cultural SPOCQ studies would help to demonstrate students' perceptions of classroom quality in different cultures. This would provide insights to meet diverse needs in various educational settings.

This study indicated that gifted students in Korea and the U.S. had better perceptions of their class quality on the aspects of Appeal, Challenge, Choice, Meaningfulness, and Academic Self-Efficacy than the general students. Researchers have stressed the importance of the five factors in learning, regardless of their gifted status (Csikszentmihalyi, Rathunde, & Whalen, 1993; Hmelo-Silver, 1998; Renzulli, 1982, 1994; Vygotsky, 1978; Zimmerman, Bandura, & Martinez-Pons, 1992). All students from any academic achievement level have the right to learn with interesting and challenging content, to have opportunities to choose topics and 'how to learn', and to find and connect meaning to their learning. These 'rights' would encourage students to achieve better and lead students to obtain higher academic self-efficacy. Providing differentiated lessons, with consideration of the five SPOCQ factors, may be an effective way to fulfill students' needs and promote their learning (Gentry & Mann, 2008).

The results from the current study provide opportunities to review student perceptions of each country's classrooms. This study was not intended to compare groups with exact matched samples, but it was intended to describe differences as descriptive and comparative views. Therefore, any results from this study cannot be directly generalized and applied to other settings. However, the results provide thinking points, such as, which factors each group of students averaged higher, or what kinds of educational services may result in high scoring factors. To ponder the results of this study may lead to efforts of school improvement.

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