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Associations between Chinese Language classroom environments and students' motivation to learn the language

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ABSTRACT

Associations between the nature of Chinese Language Classroom Environments and Singapore secondary school students' motivation to learn the Chinese Language were investigated. A sample of 1,460 secondary three (grade 9) students from 50 express stream (above average academic ability) classes in Singapore government secondary schools was involved in the study. The perceptual measure approach was used to investigate the nature of Chinese Language classroom learning environment. A well-validated classroom environment instrument, the *Chinese Language Classroom Environment Inventory (CLCEI)* (Chua, Wong, & Chen, 2006; Chua, 2004) was used to investigate teachers' and students' perceptions towards their Chinese Language classroom learning environments in six dimensions, namely 'Student Cohesiveness', 'Teacher Support', 'Involvement', 'Cooperation', 'Task Orientation' and 'Equity'. Students' motivation to learn the Chinese Language was examined using the *Chinese Language Motivation Scale* (CLMOTS) (Soh, 1993). Two statistical procedures, simple correlational analysis and multiple regression analysis, were used to examine the relationships between students' motivation to learn the Chinese Language and the nature of their Chinese Language classroom learning environments. The results from the simple correlational analysis indicated that students' motivation to learn Chinese Language was found positively correlated with all the six learning environment dimensions under investigation. However, the results from the multiple regression analysis indicated that students' motivation to learn Chinese Language were associated with only three dimensions of the learning environments, 'Teacher Support', 'Involvement' and 'Task Orientation', where the 'Task Orientation' dimension having the most significant association with students' motivation to learn Chinese Language. The findings are consistent with many previous studies on motivation that academically motivated students are usually those students who are task-orientated (Gardner, 2001; Stipek, 1993).

BACKGROUND

Classroom learning environment research

This section provides the background of conducting this classroom learning environment study that is the first classroom environment study conducted in the context of Chinese Language classrooms in Singapore.

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Classroom learning environment research is an important educational research area that has received much attention from many educational researchers. It has rich literature that spans a few decades with a sizable number of studies conducted in different countries. The literature of the classroom environment research has been reviewed extensively over the years (Haertel, Walberg, & Haertel, 1981; Fraser, 1986; Fraser, 1991; Fraser, 1998; Fraser, 2002; Fraser, 2007). These reviews indicated that most of the studies investigated the nature of classroom learning environments using the perceptual measures approach in which teachers' and students' perceptions toward their classroom learning environments were measured using a survey-type instrument.

Reviews on classroom learning environment research using perceptual measures approach classified such studies into four different types according to their respective main objectives (Fraser, 1991; Fraser, 1998; Fraser, 2002; Fraser, 2007). The four different types are:

(1) associations between students' learning outcomes and perceptions of classroom environment,

(2) use of classroom environment dimensions as criterion variables,

(3) investigations of whether students achieve better when in their preferred environments, and

(4) practical attempts to improve classroom environments.

For the purpose of this paper, only the first type of classroom environment studies will be elaborated. Studies of the first type involved the investigation of the associations between students' cognitive and affective learning outcomes and their perceptions of psychosocial characteristics of their classroom environment (Haertel, Walberg, & Haertel, 1981). These studies used different variables to indicate various learning outcomes. For example, academic achievements (Anderson & Walberg, 1968; Anderson, 1970; Walberg, 1972; Wiestra, 1984), the degree of participation in classroom activities (Anderson & Walberg, 1968; Anderson, 1970; Walberg, 1972), science attitude scores (Lawrenz, 1976; Fraser, 1978; Fraser, 1979; Wong & Fraser, 1996), examination results (Walberg & Anderson, 1972), inquiry skills (Fraser, 1978; Fraser, 1979) and anxiety (Fraser, Nash & Fisher, 1983; Fraser, Pearse & Azmi, 1982). All these studies found that there were associations between students' learning outcomes and their perceptions of psychosocial characteristics of their classroom environment.

Reviews on early classroom environment studies revealed that there were associations between students' perceptions towards their classroom learning environments and their cognitive and affective learning outcomes (Fraser, 1986; Haertel, Walberg, & Haertel, 1981). For example, Fraser (1994) had tabulated a set of 40 past environment studies in which the effects of classroom learning environment on student outcomes were investigated. Many classroom environment studies continued to investigate environment-outcomes associations for different classrooms in different countries using different outcome variables (Chua, 2004). For example, associations between learning outcomes and students' perceptions of classroom learning environments were found in Chemistry classes (Fraser & McRobbie, 1995; McRobbie & Fraser, 1993), in Biology classes (Fisher, Henderson, & Fraser, 1995; Fisher, Henderson, & Fraser, 1997) and in Mathematics classes (Fisher, Fraser, & Rickards, 1997) for Australian students. Chua (2004) also reported that the differences between student-actual and student-preferred, between gender of students and between courses were frequently investigated by many environment studies of the first type. In recent years, researchers continue to work on classroom environment studies using classroom environment dimensions as criterion variables (dependant variable) to evaluate different independent variables. For example, the investigation of the differences in perceptions of young students and their parents towards the actual and preferred science learning environments in South Florida, USA (Allen & Fraser, 2007), evaluation of adult Computer courses in Singapore (Khoo & Fraser, 2008), and identification of exemplary science teachers (Waldrip & Fisher, 2001). Also, in the study of Nair and Fisher (2001), the independent variables investigated were the differences between students' and instructors' actual and preferred perceptions of their classroom learning

environments at the senior secondary and tertiary levels of education. These recent studies also found there were associations between students' learning outcomes and their perceptions of psychosocial characteristics of their classroom environment

Classroom learning environment research has also attracted considerable interest among many educators in Singapore (Goh & Myint, 2002). A number of classroom environment studies had been conducted in Singapore for different classroom contexts at different educational levels. With the use of Singapore samples, associations between learning outcomes and classroom learning environment were also found in Chemistry classes (Wong & Fraser, 1996), Geography classes (Teh & Fraser, 1995) and Mathematics classes (Goh, Young, & Fraser, 1995). The review on classroom environment studies conducted in Singapore indicated that associations between learning outcomes and Chinese Language classroom learning environment had not been investigated in Singapore before this study was conducted (Chua, 2004).

This present study was the first classroom learning environment study conducted in the context of Chinese Language classrooms in Singapore. It investigated teachers' and students' perceptions towards their Chinese Language classroom learning environments in six dimensions, namely 'Student Cohesiveness', 'Teacher Support', 'Involvement', 'Cooperation', 'Task Orientation' and 'Equity in Singapore secondary schools. This study is significant in that it is aligned with the Singapore Chinese Language education policy that is described in the following paragraph.

Singapore Chinese Language Education Policy

The Singapore government has always emphasized the importance of the bilingual education policy for Singapore as a multi-racial society (http://intranet.moe.gov.sg). Singapore's bilingual policy is customized to meet the needs of its multi-racial society in that its Mother Tongue Language Policy requires all students who are Singaporeans or Singapore Permanent Residents to study their respective official Mother Tongue Language. With the Chinese as the largest ethnic group in Singapore, the largest group of students studies Chinese Language as the mother tongue subject in schools from pre-primary school level to pre-university level. Educational policies pertaining to the learning of the Chinese Language have also been revised periodically to ensure that an appropriate standard of Chinese Language is taught to the students. However, students' poor motivation in learning the Chinese language has always been a major concern in Singapore (http://intranet.moe.gov.sg). Among many reasons that contribute to students' low motivational level in learning the Chinese Language, the classroom learning environment could be an important reason because previous environment research in other subject areas had indicated that there is an association between students' learning outcomes and classroom environment. It is, therefore, the intention of this study to investigate the relationships (if any) between students' motivation to learn the Chinese Language and the classroom learning environment with the aim of exploring measures to promote students' motivation to learn the Chinese Language. Understanding the background of research on students' motivation in language learning which is described below, will also be useful in conducting this study.

Research on students' motivation in language learning

Research on students' motivation in language learning has been extensively explored and the majority of these studies focused primarily on the learners. These studies looked into various factors that affected students' motivation in language learning. For example, individual differences, characteristics of the learners such as attitude, language anxiety, self-confidence, intelligence, field-independence and many other personal variables (Gardner, 2001); the background of the learners, including academic grade, language examination grades, gender and home language (Soh, 1993). Research also suggested that a good classroom environment would enhance students' motivation in language learning (Dornyei & Csizer, 1998). The review by Chua (2004) also indicated that students' motivation toward the learning of the Chinese Language for Singapore secondary school students had not been investigated; therefore, an objective of this study was also to examine students' motivation to

learn the Chinese Language in Singapore with the ultimate objective of finding whether there is any association between the nature of Chinese Language classroom learning environments and students' motivation to learn Chinese Language. The findings of the study can then be used to identify those existing classroom characteristics that could be used to explain students' poor motivation towards the learning of the Chinese language in Singapore.

OBJECTIVE

In reporting part of a larger study on an investigation of the Chinese Language classroom learning environments in Singapore secondary schools (Chua 2004), this article focuses on examining the associations between the students' perceptions of the psychosocial aspects of the Chinese Language classroom learning environments and their motivation towards learning the Chinese Language.

METHOD

Sample

The sample used in this study comprised of 1460 secondary three (grade 9) students from 50 express stream (above average academic ability) classes. The sample was randomly selected from 25 government secondary schools in Singapore. As 75% of secondary schools are government schools, students of Chinese Language classes from the government secondary schools could be the most suitable representatives of the population for this study.

Instruments

Two instruments, the Chinese Language Classroom Environment Inventory (CLCEI) (Chua, Wong, & Chen, 2006; Chua, 2004), and the Chinese Language Motivation Scale (CLMOTS) (Soh, 1993), were used in this study to measure students' and teachers' perceptions of the Chinese Language classroom learning environments and the students' motivation to learn the Chinese Language respectively. The CLCEI was customised and modified from the original English version of the 'What Is Happening in This Class? (WIHIC)' Questionnaire (Fraser, Fisher, & McRobbie, 1996) and its Taiwanese Chinese version (Huang & Fraser, 1997). It is a validated bilingual instrument in which every item is written in both English and Chinese (Chua, Wong & Chen, 2006). The items are presented in two languages because although the study focused specifically on the Chinese language classroom learning environments, the researchers felt that it would be more effective if students could refer to the English items in case they had difficulties fully understanding the meaning of the Chinese items.

The CLCEI consists of six 8-item scales examining 6 different dimensions of the Chinese language classroom learning environments, namely, *Student Cohesiveness, Teacher Support, Involvement, Cooperation, Task Orientation* and *Equity.* A description of each dimension is given in Table 1 below:

The instrument was validated with a sample of 1460 secondary three (grade 9) students from 50 express stream (above average academic ability) classes in 25 secondary schools in Singapore. The validation results showed that all the six scales of the CLCEI had high internal consistency reliability and adequate discriminant validity. For the student-actual form of the CLCEI, the Cronbach alpha coefficients ranged from .82 to .91 when the individual student's score was used as the unit of analysis and from .87 to .96 when the class mean was used as the unit of analysis. For the student-preferred form of the CLCEI, the Cronbach alpha coefficients ranged from .90 to .93 when the individual student's score was used as the unit of analysis and from .96 to .97 when the class mean was used as the unit of analysis. The validation results also indicated that each scale of the CLCEI had the ability to differentiate between perceptions of students from different Chinese Language classes (Chua, Wong, &

Table 1: Description of the CLCEI scales in its Student (Personal) Actual Form using a sample item (English and Chinese versions)

Scale	Description	Sample Item
Student Cohesiveness	Extent to which students know, help and are supportive of one another.	I am friendly to members of this Chinese Language class. 我对这华文班上的同学很友善。
Teacher Support	Extent to which the teacher helps, befriends, trusts and is interested in students.	The Chinese Language teacher goes out of his/her way to help me. 华文老师会尽其所能地帮助我。
Involvement	Extent to which students have attentive interest, participate in discussions, do additional work and enjoy the class.	I give my opinions during Chinese Language class discussions. 在华文班上讨论时，我会提出我的见解。
Task Orientation	Extent to which it is important to complete activities planned and to stay solving and investigating.	I know what I am trying to accomplish in this Chinese Language class. 我知道在这华文班上，我正在尽力完成的事项。
Cooperation	Extent to which students cooperate rather than compete with one another on learning tasks.	I cooperate with other students on Chinese Language class activities. 我能和其他同学合作进行华文班上的活动。
Equity	Extent to which students are treated equally by the teacher.	I am treated the same as other students in this Chinese Language class as other students 在这华文班上，我与其他同学受到同等的待遇。

Chen 2006). The discriminant validity, described as the extent to which a scale measures a unique dimension not covered by the other scales of the instrument, indicated that the mean correlation of a scale with the other five scales ranged from .44 to .52 for the student-actual form of the CLCEI and from .56 to .68 for the student-preferred form when using the individual student's score as the unit of analysis. In addition, the 1460 students' responses to the 48 items of the student-actual form and 48 items of the student-preferred form of the CLCEI were subjected to separate principal components factor analyses (with varimax rotation) involving the individual student's score as the unit of analysis. The factor structure of the CLCEI which evolved showed that all 48 items of the student-actual form and the student-preferred form loaded neatly into their six *a priori* scales with all items having factor loadings greater than 0.40 on their respective scale. Detailed results of the validation were reported in Chua, Wong and Chen (2006).

The 48 items of the CLCEI were scored on a five-point scale namely, 'Almost never', 'Seldom', 'Sometimes', 'Often' and 'Almost always', indicating the degree of agreement with each statement by the respondents. The CLCEI, like the original WIHIC questionnaire, was written in two forms, personal form and class form. For this study, the personal form and the class form of the CLCEI were renamed the student-form and the teacher-form respectively and were used to measure students' and teachers' perceptions towards their Chinese Language classroom environments respectively. Each form also came in two different versions, the actual and the preferred versions. The actual version was used to assess the perceptions of the actual classroom learning environments, whereas the preferred version was used to assess the perceptions of the preferred (ideal) classroom learning environments of the respondents. In all, there were four forms of the CLCEI, student-actual, student-preferred, teacher-actual and teacher-preferred forms. The student-actual and student-preferred forms were used to assess students' perceptions of their actual and preferred classroom learning environments respectively, likewise the teacher forms for the teacher.

The second instrument used in this study was the Chinese Language Motivation Scale (CLMOTS) developed by Soh in 1993. It was developed to measure elementary school students' motivation to learn the Chinese Language in Singapore (Soh, 1993). Its items covered both the affective and behavioral aspects of language learning and were related to the language classroom activities being carried out by the teachers and students. The draft version of the CLMOTS consisted of 30 items assessing five different dimensions of language motivation which were conceptualised by Hart (1981). The five dimensions were 'preference for challenge' (versus 'preference for easy work'), 'curiosity and interest' (versus 'teacher approval'), 'independent mastery attempts' (versus 'dependence on the teacher'), 'independent judgement' (versus 'reliance on the teacher's judgement'), and 'internal criteria' (versus 'external criteria') for success or failure. The CLMOTS was then refined by Soh himself to only 11 items with the consideration of motivation at the language classroom situation that was specified by Crookes and Schmidt (1991). They suggested that a motivated student in class would be productively engaged in learning tasks and would be able to sustain that engagement without the need for continual encouragement or direction. Thus, the 11 items of the CLMOTS were related to students' involvement in classroom learning tasks. The items of the CLMOTS have a four-point response scale. The 4 response alternatives, 1 = 'Always Not True', 2 = 'Not True', 3 = 'True' and 4 = 'Always True', indicate the degree of applicability of the statements to the students.

Data Analysis

Relationships between the students' perceptions of their Chinese Language classroom environment as assessed by the student-actual form of the CLCEI and their motivational outcome as measured by the CLMOTS were investigated using two main methods of analysis, namely:

1. simple correlational analysis of associations between students' motivation to learn the Chinese Language and each individual environment scale,
2. multiple regression analyses of associations between students' motivation to learn the Chinese Language and the set of six environment scales as a whole.

The simple correlational analysis was carried out first to examine the associations between the nature of the Chinese Language classroom learning environment and students' motivation to learn the Chinese Language as it is an appropriate method for examining associations between two specific variables of interest. The Pearson Correlation Coefficients (r) was used for reporting the results. In order to reduce possible Type I error that could be caused by treating the six scales of the CLCEI as six independent scales in the simple correlational analysis, the multiple regression statistical procedure was also carried out for this investigation. In the latter analysis, the motivation score was used as the dependent variable and the set of six environment scales as a whole was used as the independent

variable. The statistics used for reporting the results of the multiple regression analyses were the standardised regression coefficient (β) indicating the associations between the dependent variable and each independent variable in the regression equation, the overall multiple correlation coefficient (*R*) and the *R*-squared which indicates the amount of variance in students' motivation that was accounted for by the environment scales.

Both the simple correlational and multiple regression analyses were done using the individual student's score as the unit of analysis first. The procedures were then repeated using the class mean as the unit of analysis. This was done to allow for comparisons between two different sets of results to be made. The result obtained from using the individual student's score as the unit of analysis indicated the associations between individual student's perceived classroom learning environment and their motivation to learn the Chinese Language, whereas the result obtained from using the class mean as the unit of analysis indicated the associations between the average class perceptions of the Chinese Language classroom learning environment and the class mean score of the motivation to learn the Chinese Language.

These two methods of statistical analysis and the two units of analysis, were chosen also because these were the main methods used in previous research which examined relationships between outcomes and students' classroom environment perceptions (Fraser, 2007), thus permitting easier comparison of the results from the present study with those of past studies.

RESULTS AND DISCUSSION

Results in Table 2 show that the simple correlation between each of the six environment scales and the students' motivation score were all positive. When the individual student's score was used as the unit of analysis, the Pearson Correlation Coefficients (*r*) for all the six scales of the CLCEI ranged from .27 (for the 'Student Cohesiveness' scale) to .64 (for the 'Task Orientation' scale), and they were all significant at $p < .01$. When the class mean was used as the unit of analysis, the values of *r* ranged from .37 (for the 'Student Cohesiveness' scale) to .80 (for the 'Task Orientation' scale), and they were all also significant at $p < .01$. The results from both analyses showed that the 'Task Orientation' scale had the greatest value of *r*. It indicated that the relationship between students' motivation to learn the Chinese Language and the 'Task Orientation' dimension of the Chinese Language classroom learning environments was the strongest among all the six scales of the CLCEI.

For the multiple regression analysis, when the individual student's score was used as the unit of analysis, the multiple correlation (R) was .64, meaning that the set of six scales accounted for 41% (i.e., R) of the variance in students' motivation. Whereas, when class mean score was used as the unit of analysis, the multiple correlation (R) was .80, indicating that the set of six scales accounted for 64% (i.e., R) of the variance in students' motivation. In order to determine which individual CLCEI scales contributed the most to explaining the variance in the motivation scores, an inspection was made of the values of standarised regression coefficients ( ) (i.e., the associations between the dependent variable and each independent variable in the regression equation).

Table 2 shows that the number of significant regression weights for the multiple regression analysis was on 3 scales ('Teacher Support', 'Involvement' and 'Task Orientation' scales) when using the individual score as the unit of analysis and on only 1 scale ('Task Orientation' scale) when class mean was used as the unit of analysis. These regression weights indicate whether a specific CLCEI scale makes a unique contribution to the variance in students' motivation scores when scores on the other five classroom environment scales are mutually controlled.

On examination of the signs and magnitudes of the significant β weights in Table 2, it showed that all the significant β weights were positive. Furthermore, the β weight for the 'Task Orientation' scale was .56 ($p < .001$). As for the 'Teacher Support' scale and the 'Involvement' scales, the β weights were both .09 ($p < .01$). However, when the procedures were repeated using the class-mean as the unit of analysis, the β weight for the 'Task

Table 2: Simple Correlation (r), Standardised Regression Coefficient (β), and Multiple Correlation (R), for associations between scores on the CLCEI scales and students' Chinese Language motivation scores using two units of analysis

Environment Scale	Unit of Analysis	Students' Motivation Scores	
		Simple Correlation Coefficient (*r*)	Standardised Regression Coefficient (β)
Student Cohesiveness	Individual	.27*	.00
	Class Mean	.48*	.01
Teacher Support	Individual	.40*	.09*
	Class Mean	.37*	.06
Involvement	Individual	.37*	.09*
	Class Mean	.39*	.02
Task Orientation	Individual	.64*	.56**
	Class Mean	.80*	.74**
Cooperation	Individual	.35*	.00
	Class Mean	.49*	.00
Equity	Individual	.37*	-.01
	Class Mean	.55*	.03
Multiple Correlation (R)	Individual	.64	$R^2 = 41\%$
	Class Mean	.80	$R^2 = 64\%$

**p <.001 *p < .01
Sample Size: 1460 students from 50 Chinese Language classes in 25 secondary schools

Orientation' scale was .74 (p < .001). The results also indicated that the relationship between students' motivation to learn the Chinese Language and the 'Task Orientation' scale of the CLCEI was the strongest among its relationship with each of the other five environment scales. That is, among the six dimensions of the classroom learning environment in the CLCEI, the dimension of the 'Task Orientation' was the strongest predictor of students' motivation to learn the Chinese Language. This finding was consistent with the results obtained from the simple correlational analysis where the simple correlation coefficient (*r*) for the 'Task Orientation' scale was the highest among the six scales of the CLCEI in the student-actual form.

In summary, both the simple correlation and multiple regression analyses showed that there was a strong relationship between the 'Task Orientation' dimension of the classroom learning environment and the students' motivation to learn the Chinese Language. The result implied that in a task-oriented class (i.e., a classroom environment with a high level of the 'Task Orientation' dimension), students would be encouraged to be more on task and hence, may lead to them being motivated to learn the Chinese Language. The finding was in line with the findings of many previous studies on motivation. For example, Nicholls (1984) in his study of 'Achievement Motivation' found that when students are intrinsically motivated, they are generally task-oriented. Similarly, Stipek (1993) explored motivation to learn and the ways of applying motivational theories to practice. The findings of his study claimed that academically motivated students are usually those students who are task-orientated. These highly motivated students would seek out strategies or develop understanding of knowledge

and skills that are needed to complete their assigned tasks. In addition, Crookes and Schmidt (1991), and Gardner and Tremblay (1994) explored four motivational orientations that can be observed in a task-oriented learning environments, namely, (a) reason for learning, (b) desire to attain the learning goal, (c) positive attitude toward the learning situation, and (d) effortful behavior. In a research study, Oxford and Shearin (1994) analyzed a total of 12 motivational theories or models, including those from socio-psychology, cognitive development, and socio-cultural psychology, and identified six factors that impact motivation in language learning. The six factors that had been identified are: (1) attitude (i.e., sentiments toward the learning community and the target language), (2) beliefs about self (i.e., expectancies about one's attitudes to succeed, self-efficacy and anxiety), (3) goals (i.e., perceived clarity and relevance of learning goals as reasons for learning), (4) involvements (i.e., extent to which the learner actively and consciously participates in the language learning programmes), (5) environmental support (i.e., extent of teacher and peer support, and the integration of cultural and outside of class support into learning experience), and, (6) personal attributes (i.e., aptitude, age, sex and pervious language learning experience). It has been found that all these factors suggested consist of features that exist in a task-oriented classroom environment (Kyriacou, 2001).

The findings of this study together with the findings of many previous motivational studies seem to suggest that a task-oriented Chinese Language classroom learning environment would heighten students' motivation in learning the Chinese Language.

CONCLUSION

This study which is the first of its kind in an Asian country and probably the world, investigated the relationship between students' perceptions of their Chinese Language classroom environment and their motivation towards studying the language. Separate methods of correlational analysis (simple and multiple regression) were carried out using two units of analysis (individual student and class mean scores). These analyses yielded results which showed that there were statistically significant associations between the nature of the Chinese Language classroom learning environment and students' motivation to learn the language. In all the analyses, the most striking finding was that, 'Task Orientation' dimension of the classroom learning environment was a strong and consistent predictor of the students' motivation to learn the Chinese Language. This finding seem to replicate the findings from previous motivational studies (Nicholls, 1984; Stipek, 1993), in that students could be motivated to learn the Chinese Language if task-oriented activities are used in these classrooms.

Based on the finding that students' motivation was strongly associated with the 'Task Orientation' dimension of the classroom learning environment, there is a wide scope for future studies, for example, to explore whether there is a cause-and-effect relationship between task-oriented Chinese Language classrooms and students' motivation to learn the language. In order to investigate this cause-effect relationship, further research involving the deliberate manipulation of the nature of the classroom environment, in particular the Task Orientation dimension, is recommended. Such controlled interventions would help to determine if the hypothesised improvements in students' motivation to study the Chinese Language actually result from increasing the level of task orientation in certain ways. In order to inculcate genuine interest of learning the Chinese Language, other explorations can include investigation of the types of task-oriented activities which could be used to cultivate the intrinsic motivation of students to learn Chinese, and the use of new media and approaches for designing task-oriented class activities and IT integrated Chinese Language lessons. Teaching and learning approaches which are suitable for cultivating intrinsic motivation for learning the Chinese Language, such as collaborative learning with project work, e-learning, problem-based learning etc. could also be explored to enhance the teaching and learning of the Chinese Language.

Another important contribution of the present study is that the CLCEI has been well validated for use in the Singapore context. Therefore other researchers and teachers in the area of Chinese Language learning can have confidence in using it in future in Singapore to pursue various research and practical applications reviewed in Fraser (2002). In addition, the research methodology used in this study may be adapted by other researchers to investigate the nature of classroom learning environment in the context of other languages, such as Malay or Tamil. These studies may explore associations between students' motivation to learn the language and classroom learning environment factors. Results of such research studies could shed light on the type of classroom learning environment that needs to be cultivated for the effective learning of different languages.

In conclusion, it is hoped that this study, together with further endeavours, continue to identify useful applications for the teaching and learning of Mother Tongue Languages in Singapore and other countries.

REFERENCES

Allen., D., & Fraser, B. J. (2008). Parent and student perceptions of classroom learning environment and its association with student outcomes. *Learning Environment Research, 93,* 48-92.

Anderson, G. J. (1970). Effects of classroom social climate on individual learning. *American Educational Research Journal, 7,* 135-152.

Anderson, G. J., & Walberg, H. J. (1968). Classroom climate and group learning. *International Journal of Educational Science, 2,* 175-180.

Chua, S. L. (2004). *An investigation of the nature of Chinese language classroom learning environments in Singapore secondary schools* (Doctoral dissertation, National Institute of Education, 2004).

Chua, S. L., Wong, F. L., & Chen, D. (2006). Validation of the 'Chinese language classroom learning environment inventory' for investigating the nature of Chinese language classrooms. *Issues in Educational Research*, *16*(2), 139-151.

Crookes, G., & Schmidt, R. W. (1991). Motivation: Reopening the research agenda. *Language Learning, 41*, 469-512. (Eric Document Reproduction Service No.: EJ 435 997).

Dornyei, Z., & Csizer, K. (1998). Ten commandments for motivation language learners**.** *Language Teaching Research, 2*, 203-229.

Fisher, D. L., Fraser, B.J., & Rickards, T. (1997). *Gender and cultural differences in teacher-student interpersonal behaviour***.** Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Fisher, D. L., Henderson, D., & Fraser, B.J. (1995). Interpersonal behaviour in senior high school biology classes. *Research in Science Education, 25,* 125-133.

Fisher, D. L., Henderson, D., & Fraser, B.J. (1997). Laboratory environments and student outcomes in senior high school biology. *American Biology Teacher 59*, 214-219.

Fraser, B. J. (1978). Developing subscales for a measure of student understanding of science. *Journal of Research in Science Teaching, 15*, 79-84.

Fraser, B. J. (1979). Evaluation of the science-based curriculum. In H. J. Walberg (Eds). *Educational environments and effects: Evaluation, policy, and productivity* (pp. 218-234). McCutchan, Berkeley, CA.

Fraser, B. J. (1986). *Classroom environment.* London: Croom Helm.

Fraser, B. J. (1991). Two decades of classroom environment research. In B. J. Fraser, & H. J. Walberg (Eds.). *Educational environments: Evaluation, antecedents and consequences.* New York: Pergamon.

Fraser, B. J. (1994). Research on classroom and school climate. In D. Gabel (Ed.). *Handbook of research on science teaching and learning* (pp. 493-541). New York: Macmillan.

Fraser, B. J. (1998). Science learning environments: Assessment, effects and determinants. In B. J. Fraser, & K. G. Tobin (Eds.). *International handbook of science education* (pp. 527-564). Dordrecht, The Netherlands: Kluwer.

Fraser, B. J. (2002). Learning environments research: Yesterday, today and tomorrow. In S. C. Goh, & M. S. Khine (Eds.). *Studies in educational learning environment: An international perspective* (pp. 1-25). Singapore: World Scientific.

Fraser, B. J. (2007). Classroom learning environments. In S. K. Abell, & N. G. Lederman (Eds.). *Handbook of research on science education* (pp. 103-124). Mahwah, NJ: Lawrence Erlbaum.

Fraser, B. J., Fisher, D. L., & McRobbie, C. J. (1996). *Development, validation and use of personal and class forms of a new classroom environment instrument*. Paper presented at the annual meeting of the American Educational Research Association, New York.

Fraser, B. J., & McRobbie, C. J. (1995). Science laboratory classroom environments at schools and universities: A cross-national study. *Educational Research and Evaluation, 1,* 289-317.

Fraser, B. J., Nash, R., & Fisher, D. L. (1983). Anxiety in science classroom measurement and relationship to classroom environment. *Research in Science and Technology Education, 1,* 201-208.

Fraser, B. J., Pearse, R., & Azmi (1982). A study of Indonesian students' perceptions of classroom psychosocial environment. *International Review of Education, 3,* 337-355.

Gardner, R. C. (2001). Integrative motivation and second language acquisition. In Z. Dornyei, & R. Schmidt (Eds.), *Motivation and second language acquisition* (pp. 1-19). Honolulu, HI: The University of Hawaii, Second Language Teaching and Curriculum Center.

Gardner, R. C., & Tremblay, P. F. (1994). On motivation, research agendas, and theoretical frameworks. *Modern Language Journal, 78*, 359-368. (Eric Document Reproduction Service No.: EJ 479 731).

Goh, S. C., & Myint, S. K. (2002). *Studies in educational learning environments—An international perspective*. Singapore: National Institute of Education, Nanyang Technological University.

Goh, S. C., Young, D. J., & Fraser, B. J. (1995). Psychosocial climate and student outcomes in elementary mathematics classrooms: A multilevel analysis. *Journal of Experimental Education, 64,* 29-40.

Haertel, G. D., Walberg, H. J., & Haertel, E. H. (1981). Social-psychological environments and learning: A quantitative synthesis. *British Educational Research Journal. 7*(1), 27-36.

Hart, S. (1981). A new self-report scale of intrinsic versus extrinsic orientation in the classroom motivation and informational components. *Developmental Psychology, 17*(3), 300-312.

Huang, I. T. C., & Fraser, B. J. (1997). *The development of a questionnaire for assessing student perception of teaching environments in Taiwan and Australia.* Paper presented at the annual meeting of the National Association for Research in Science Teaching, Chicago.

Khoo, H. S., & Fraser, B. J. (2008). Using Classroom psychosocial environment in the evaluation of adult computer application courses in Singapore. *Technology, Pedagogy & Education, 17,* 53-67.

Kyriacou, C. (2nd Eds). (2001). *Essential teaching skills*, UK: Nelson Thornes.

Lawrenz, F. P. (1976). The prediction of student attitude toward science from student perception of the classroom learning environment. *Journal of Research in Science Teaching, 13,* 509-515.

McRobbie, C. J., & Fraser, B. J. (1993). Association between student outcomes and psychosocial science environment. *Journal of Educational Research, 87,* 78-85.

Nair, C. S., & Fisher, D. L. (2001). Learning Environments and Student Attitudes to Science at the Senior Secondary and Tertiary levels, *Issues in Educational Research, 11*(2), 12-31.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91*(3), 328-346.

Oxford, R., & Shearin, J. (1994). Language learning motivation: Expanding the theoretical framework. *Modern Language Journal, 78*(1), 12-28.

Stipek, D.J. (1993). *Motivation to learn: From theory to practice* (2nd Ed). US: Allyn and Bacon.

Soh, K. C. (1993). Measuring motivation to learn Chinese and English through self-reported feelings and behaviours. *Singapore Journal of Education, 13*(1), 44-50.

Teh, G., & Fraser, B. J. (1995). Development and validation of an instrument for assessing the psychosocial environment of computer-assisted learning classrooms. *Journal of Educational Computing Research, 12*, 177-193.

Walberg, H. J. (1972). Social environment and individual learning: a test of the Bloom model. *Journal of Educational Psychology, 63,* 69-73.

Walberg, H. J., & Anderson, G.J. (1972). Properties of the achieving urban class. *Journal of Educational Psychology, 63*, 381-385.

Waldrip, B., & Fisher, D. L. (2001). *Perceptions of student-teacher interactions in exemplary science teachers' classroom.* Paper presented at the annual conference of the Australian Association for Research in Education, Fremantle, Australia.

Wierstra, R. (1984). A study on classroom environment and on cognitive and affection outcomes of the PLON-curriculum. *Studies in Educational Evaluation, 10,* 273- 282.

Wierstra, R. F. A., Jorg, T. G. D., & Wubbells, T. (1987). Contextual and individually perceived learning environment in curriculum evaluation. In B. J. Fraser (Ed.), *The study of learning environments* (Vol. 2; pp.31-41). Perth: Curtin University of Technology.

Wong, F. L., & Fraser, B.J. (1996). Environment-attitude associations in the chemistry laboratory classroom. *Research in Science and Technological Education*, *14,* 91-102.

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