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Using the WIHIC Questionnaire to Measure the Learning Environment

Myint Swe Khine

INTRODUCTION

It has been suggested that at the end of secondary schooling, a student will have spent as much as 15,000 hours in school (Fraser, 1989). Most of their time is spent interacting among themselves as well as with their teachers. Besides, they use a variety of tools and information resources in their pursuit of learning activities in the classroom. The classroom can indeed be considered a miniature society, which consists of individual students with varying interests, diverse backgrounds and wide-ranging personalities. One class may be quiet and passive, but another can be noisy and active. The nature of the classroom environment and psychosocial interactions can make a difference in how the students learn and achieve their goals. In recent years, the study of the classroom learning environment is gaining momentum and making significant contributions to the improvement of teaching and learning. The purpose of this paper is to examine the background of the study of learning environment and to introduce a recently developed questionnaire called *What is Happening in This Class?* (WIHIC). The questionnaire is designed to measure students' perception of their classroom environment in various educational contexts.

THEORETICAL BACKGROUND

The study of the classroom learning environment attempts to identify what environmental factors are conducive for learning and the reasons why these factors have such influence. According to Lewin (1936), all behaviour and experience is an interactive function (f) of the person and the environment. His mathematical formula $B=f(P, E)$ indicates that behaviour (B) reflects the environment (E) and the person within the environment (P). This formula stressed the need for new research strategies in which behaviour was considered to be a function of the person and the environment. Past studies showed that there were associations between the types of environment and the nature of students' learning (Fraser, 1999).

The use of systematic observations and survey questions are common approaches to the study of the learning environment. Structured or unstructured interviews with students and teachers are another useful approach to finding out their perceptions of the classroom. But each of these techniques tend to pose some problems in the collection and interpretation of data (Tessmer & Harris, 1992). The learning environment questionnaire seems to be the most economical and least time-consuming for the students and teachers. Several studies on the development of classroom environmental research instruments and their applications have been documented. Fraser (1999) reported the use of instruments for assessing students' perceptions of classroom environment. Among these are *Individualized Classroom Environment Questionnaire* (ICEQ), *Science Laboratory Environment Inventory* (SLEI), *Questionnaire on Teacher Interaction* (QTI) and *Constructivist Learning Environment Survey* (CLES). Each of these instruments is designed to measure the specific features and unique dimensions of the classroom environment.

The Questionnaire on Teacher Interaction (QTI) was based on a Model of Interpersonal Teacher Behaviour and it was designed to measure the perception of student-teacher relationships, an important aspect of interpersonal communication in the classroom (Goh, 1994). The questionnaire measures the eight possible teacher behaviours namely Leadership, Helping/Friendly, Understanding, Student Responsibility and Freedom, Uncertain, Dissatisfied, Admonishing and Strict behaviour. Typical items are "This teacher talks enthusiastically about her/his subject" (Leadership), and "This teacher gets angry unexpectedly" (Admonishing).

DEVELOPMENT OF THE WIHIC

While the above mentioned learning environment research instruments contributed to a better understanding of the socio-psychological climate of the classrooms, some researchers felt that there was a need for a single instrument which incorporated some of the best features of the instruments previously constructed. Based on past studies, Fraser, Fisher, and McRobbie (1996) developed a new learning environmental instrument named *What Is Happening In This Class?* (WIHIC) which incorporates scales that have been used and proven to be significant predictors of learning outcomes. They also included additional scales which were designed to measure current concerns in the classrooms, such as equity issues.

The WIHIC consisted of 7 scales and 56 items. The seven scales are

Student Cohesiveness, Teacher Support, Involvement, Investigation, Task Orientation, Cooperation and Equity. Table 1 shows the WIHIC scales complete with a brief description of each scale and a sample item. The WIHIC has Personal and Class forms to measure the perceptions of students at the personal and class levels, and Actual and Preferred forms to measure the actual environment of the classroom and the environment preferred by the students.

Table 1. Scale Descriptions and Example Items of the WIHIC Questionnaire

Scale	Description	Item
Student Cohesiveness [SC]	Extent to which students are friendly and supportive of each other.	I make friendships among students in this class.
Teacher Support [TS]	Extent to which the teacher helps, befriends, and is interested in students.	The teacher takes a personal interest in me.
Involvement [IV]	Extent to which students have attentive interest, participate in class and are involved with other students in assessing the viability of new ideas.	I discuss ideas in class.
Investigation [IN]	Extent to which there is emphasis on the skills and of inquiry and their use in problem solving and investigation.	I carry out investigations to test my ideas.
Task Orientation [TO]	Extent to which it is important to complete planned activities and stay on the subject matter.	Getting a certain amount of work done is important.
Cooperation [CO]	Extent to which students cooperate with each other during activities.	I cooperate with other students when doing assignment work.
Equity [EQ]	Extent to which the teacher treats students equally, including distributing praise, question distribution and opportunities to be included in discussions.	The teacher gives as much attention to my questions as to other students' questions.

The questionnaire is usually administered in a class which typically consists of 20–30 students, rather than to a large group. The students are asked to provide their responses on a five-point Likert scale of Almost Never, Seldom, Sometimes, Often and Almost Always. The students answer how often they perceive a classroom practice occurring in these respective dimensions. The total score for a particular scale is simply the sum of the circled numbers for the eight items belonging to that scale. Omitted or incorrectly answered items are given a score of 3. The higher the scale score, the more a classroom practice occurs in that dimension.

RESEARCH ON CLASSROOM ENVIRONMENT USING THE WIHIC

Since its development, the WIHIC has been used to measure the psychosocial aspects of the classroom learning environment in various contexts. In some research, the questionnaire has been used without any modification, and in others the questionnaire was adapted to suit a specific context. To date the original questionnaire in English has been translated into the Chinese language for use with Chinese medium students in Taiwan and Singapore, and the Korean language for use in Korea.

The study by Rawnsley and Fisher (1997) attempted to find out the associations between learning environments in mathematics classrooms and students' attitudes towards the subject in Australia using the WIHIC questionnaire. When the questionnaire was administered to 490 Year 9 students, it was found that students' attitudes were associated with some of the environment scales. They found positive associations between the students' attitude to class and Teacher Support, Involvement, Task Orientation and Equity.

In an attempt to explore the potential of cross-cultural studies, Fraser and Aldridge (1998) examined classrooms in Australia and Taiwan using English and Chinese versions of the WIHIC. The questionnaire was administered to a sample of 1081 grade 8 and 9 general science students from 50 classes in Western Australia and 1879 grade 7 and 8 students from 50 classes in Taiwan. Internal consistency reliability ranging from 0.81 to 0.93 for Australia, and from 0.85 to 0.90 for Taiwan, were established. The results showed that students in Australia consistently viewed their classroom environment more positively than students in Taiwan. Significant differences were detected on the WIHIC scales of Involvement, Investigation, Task Orientation, Cooperation, and Equity. This means that students in Australia perceived they are given more opportunity to get involved in the

experiments and investigate scientific phenomena. They also believed that teachers are cooperative and give an equal chance of participation to both genders.

In this study, cultural differences were highlighted and it appears that the education system in Taiwan is examination-driven and teaching styles are adopted to suit this particular situation. It was found that in Taiwan the most important element of being a good teacher was perceived as having good content knowledge, but in Australia, having good interpersonal relations between teacher and students may be considered the most important element in the education process. Taiwanese classrooms offer a teacher-centred lesson in which students appear to play a passive role and there were only few opportunities to discuss or question. This study suggests that the WIHIC questionnaire was able to differentiate between cultural differences and therefore may be suitable for cross-cultural studies.

Associations between perceptions of learning environment and attitudinal outcomes were reported by Hunus and Fraser (1997) when they used a modified version of WIHIC for 644 students in Year 10 chemistry classes in Brunei. In their study, reliability coefficients of 0.75 to 0.89 were found, and simple and multiple correlation analyses show that there was a significant relationship between the set of environment scales and students' attitudes towards chemistry theory classes. Using the individual student as the unit of analysis, Student Cohesiveness, Teacher Support, Involvement, and Task Orientation scales were found to be positively associated with the students' attitudes. The results further suggested that students perceived moderately positive learning environments in chemistry theory classes in terms of Student Cohesiveness, Teacher Support, Involvement and Investigation. A highly positive environment on Task Orientation and Cooperation was also detected in the chemistry classrooms. However, the students in Brunei perceived that they had relatively little autonomy and independence in their classes.

The study by Khoo and Fraser (1997) also used a modified version of the WIHIC to measure classroom environment in adult computer courses in Singapore. When the questionnaire was introduced to 250 working adults, it was found that scale alpha reliabilities ranged from 0.77 to 0.92. In investigating the differential effectiveness of computer courses for each gender, they found that males perceived significantly greater Involvement and Trainer Support. On the other hand, females perceived significantly higher levels of Equity in the computer classroom environment. In addition, it was found that older females have more positive perceptions than younger females in this context.

Chionh and Fraser (1998) used Actual and Preferred forms of WIHIC to further validate the instrument and to investigate associations between the actual classroom environment and the outcomes of examination scores, self-esteem and attitudes. The questionnaire was administered to 2310 students from 75 randomly selected grade 10 geography and mathematics classes in Singapore. The alpha reliability of the scales in the instrument was found to be from 0.88 to 0.97. The study revealed that better examination scores were found in geography and mathematics classrooms where students perceived the environment as being more cohesive. It was also found that self-esteem and attitudes were more favourable in classrooms perceived as having more teacher support, task orientation and equity.

Gender-related differences in students' perceptions of their learning environments and teachers' personal behaviour were explored by Kim, Fraser, and Fisher (2000) using the WIHIC. The study involved 543 grade 8 students in 12 different secondary schools in metropolitan and rural areas of Korea. The alpha reliability coefficient was used as the index of scale internal consistency and ranged from 0.82 to 0.92, suggesting that all scales of the WIHIC possess satisfactory internal consistency. Statistically significant differences were also found between boys' and girls' perceptions of the learning environment on all seven scales. It was reported that boys perceived more Teacher Support, Involvement, Investigation, Task Orientation, and Equity than did girls. This study supports the view that the WIHIC questionnaire was able to differentiate gender differences and therefore may be suitable for gender studies.

CONCLUSION

The above mentioned studies conducted in Australia, Brunei, Korea, Singapore and Taiwan supported the reliability of the instrument, and consistently showed the associations between the environment, students' attitudes and learning outcomes. The studies also indicate the sensitivity of the instrument and its usefulness in differentiating between cultural and gender differences. The WIHIC is consistent with the theory of learning environment and is likely to provide meaningful information and feedback to practising teachers. It is hoped that educational researchers and teachers will make use of this instrument to identify certain salient features of the classrooms in improving their learning environment.

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