ATTRIBUTES OF MEANINGFUL FIELD TRIP EXPERIENCES

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Abstract

This research used a newly created survey to identify both important attributes of a meaningful field trip experience from a teacher's perspective and factors that influence teachers to organize these experiences. The research was informed by aspects of field trip theory and the study of learning environments as described in scholarly literature. This thesis reviews adaptations made to existing learning environment scales and outlines methods of implementation for elementary teachers. Statistical tests revealed that the survey was valid and reliable and were useful in identifying trends from the teachers' responses. Qualitative data from the survey and follow-up interviews were examined in relation to the quantitative data. Data from the learning environment section indicated that teachers consider Teacher Supportiveness, Interactive Environment and Curriculum Integration as the most important learning environment characteristics when considering an ideal field trip. Survey results also indicated that affordability of field trip experiences is a major concern.

> "Children should be led to make their own investigations, and draw their inferences. They should be told as little as possible and encouraged to discover as much as possible." (Spencer, 1861/1932)

Historical science educators, including Herbert Spencer and followed by Dewey, Piaget and Rousseau identified the importance of learning through inquiry, discovery and observation. In addition, these instrumental authors and educators also recognized the importance of learning through play and pleasurable experiences. Field trip opportunities have the potential to be exactly what science education should be, hands-on, investigative and discovery based. This study hopes to encourage and facilitate these ideals.

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Chapter 1 Rationale, Overview and Chapter Summary

This study arose out of an investigation into a relatively new area of educational research: the study of how and to what extent the characteristics of learning influences student and/or teachers' perceptions of their learning environment. Methods to measure the perceptions of learners/teachers within this field of study include using quantitative instruments (surveys) and qualitative methods such as interviews and focus groups.

Field trips are a common exercise used to complement the classroom curriculum activities. As a former high school teacher that has spent the last two years developing field trip activities for elementary and high school students, I was interested in what concerns teachers with respect to their experiences during a field trip. In addition, the author was also interested in quantifying the challenges teachers face when organizing a field trip and determining whether these factors include learning environment characteristics or more logistical features (e.g. organisational time, money collection, parental support etc.). Classroom teachers initiate fieldtrips for a variety of reasons, yet little research has been done with respect to the characteristics of an ideal field trip from a teacher's perspective. Knowing these characteristics and the factors that influence teachers to book a field trip experience will allow field trip facilities to

both evaluate their existing programs and design future programs to meet the needs of their clientele.

This research is grounded in two distinct areas of educational literature, the study of learning environments and literature on school field trips. Existing learning environment theory (Fraser 1993, 1998a, 1998b, 2002, 1996; Orion 1997; Wubbels and Brekelman 1998) was interfaced with field trip theory (Anderson and Zhang 2003, Dierking and Falk 1994, 1997; Griffin and Symington 1997; Knapp and Poff 2001; Michie 1998; Millan 1995; Naizer 1993; Nespor 2000; Orion 1993; Orion and Hofstein 1994) to provide a background and justification for using learning environment practices to examine and reflect on ideal field experiences from a teacher's perspective. This literature search, in conjunction with the author's past experience in teaching and designing/implementing field trip activities resulted in the following research questions:

1. To what extent are the characteristics of students' learning environment considered by classroom teachers when they are asked to reflect on an ideal field experience.
2. To what extent do these characteristics and/or other logistical factors influence teachers when they book an actual field experience for their students.

The following sub questions were designed to further guide the research project.

1. Survey Validation
    - Does the Preferred survey meet the criteria (using standards from the Cronbach Alpha and Discriminant Validity statistical tests) as a valid and reliable learning environment tool?

2. Field Experiences as a Learning Environment

    - What are the attributes of an ideal field trip from teachers' perspectives?
    - Which of the seven scales are most important to teachers interested in field experiences?
    - Are all of the statements found within the scales important to teachers, or are there individual statements within the scales that are more relevant to practicing teachers?

3. Factors Influencing Field Trip Participation

    - To what extent do teachers choose field trip facilities based on the degree to which the facilities considers aspects of students' learning environment?
    - To what extent do other factors (i.e. logistical obstacles) play a role in a teacher's decision to organize a field trip?
    - To what extent is the decision based on a combination of learning theory and logistical factors?

Rationale

This study is unique in that it modified an existing student survey to allow teacher' to comment on their perspective of an ideal field trip. In addition it combines learning environment research with an opportunity for teachers to consider both the learning environment features and other factors in determining their choice of whether to participate in field trips as a professional educator.

It is an important study for a number of reasons: the study gives the user (in this case the teacher; in future studies, the student) a means of commenting on an educational experience from their perspective. It will also allow field trip facilities to have a bench marks within each of the categories of learning environment for future reference. Finally, this study has the potential to start a dialogue within the local education community (teachers and field trip facilities) with respect to the characteristics of learning environments and how

consideration of these characteristics can enhance educational programs, both in and outside of the classroom.

With exception noted with respect to the current teacher action research movement, historically teachers and students have little involvement in educational research apart from being a research subject that is observed and recorded by an external researcher. This study is important in that it recognizes that the "client" of educational programs, in this case the teacher, has a valuable voice with respect to what they perceive as a valuable learning environment. This was described by Fraser (1998 a) as "defining the classroom environment in terms of the shared perception of the students and teachers has the dual advantage of characterizing the setting through the eyes of the participants themselves and capturing data which the observer could miss or consider unimportant." If one substitutes the word classroom with field trip, the technique used in this study can be used to give teachers (in this study) an opportunity to comment on their perceptions of an ideal field trip.

Not only do the participating teachers have input, the results of this study provide an initial framework for local (Vancouver, BC, Canada.) field trip facilities to examine their field trip opportunities. The use of learning environment research results to improve educational programs and environments has been documented by Fraser when he commented that participants' "perceptions [were] employed as a basis for reflection upon, discussion of, and systematic attempts to improve classroom environments, (Fraser, 1998b). Thus it is hoped that field

trip facilities will use this study to reflect on the learning environments created in their field trip opportunities offered to local schools.

It is the author's belief that while the characteristics of learning environments are subconsciously considered by the teaching profession, few teachers consciously reflect on the learning environment that they indirectly and directly establish for their students. The participation in this study exposes teachers to the ideas found within the parameters of learning environment research and has the potential to encourage teachers to reflect on other learning environments within their world. Heath (1985) addresses this idea by commenting on the teaching of others "we do not empower others by offering them our techniques; we empower them by helping them internalize principles of broad generality that provide guidelines to them for creating their own techniques". (Heath, 1985) Thus teachers, by being exposed to this study, have the opportunity to extrapolate their concepts addressed in this study to their own practice.

Chapter Summary

This study is designed to apply the study of learning environments and field trip theory to determine the characteristics of an ideal field trip and to describe factors that influence teachers' decision-making when booking a field trip excursion for their class. This first chapter includes a summary of the project. The next chapter (Chapter 2) provides an extensive literature review. Included in this literature review is an overview of the study of learning environments in addition to a review of literature as it pertains to field trips. The final section of

the literature review integrates these two areas to provide a review of how learning environment methodology can be used to study and evaluate field trip opportunities. Chapter 3 reviews the methodology used in this study including a detailed description of how quantitative and qualitative data were collected, compiled and analyzed. In addition this chapter includes a brief overview regarding validation of the newly designed survey that was used in this study using Cronbach Alpha and discriminate validity statistical analysis. Finally, Chapter 3 includes the identification and discussion of any issues that arose during the data collection. Chapter 4 includes the results of the study. Specifically this chapter includes a summary of teachers' responses to the survey and draws conclusions with respect to both the learning environment factors that are important to practicing teachers during field experiences and factors that influence teachers to book field trip experiences. The discussion and conclusions from the study can be found in Chapter 5. This chapter reviews and provides analysis using the results from the data collection. In addition, this chapter explores the limitations of this study and introduces future research directions as they pertain to this study.

Chapter 2 – Literature Review

This chapter begins with an introduction to the purposes of field trips, a validation of field trips as an educational activity and factors that influence teachers to participate in field trip activities. It then continues with an overview of the history of the study of Learning Environments within the field of educational research. This will include a general overview of the types of studies that have used learning environment instruments and a more specific description of three exemplars of learning environment research in fields outside the scope of this research project. The literature review continues with an examination of the relevant literature on educational field trips within the framework of the learning environment theory, integrating fieldtrip literature with learning environment literature.

Field Trip – Rationale and Learning

Field trips to external sites occur because teachers feel they provide a worthwhile and beneficial complement to classroom studies. Teachers have varied reasons for organizing and participating in fieldtrips that include "five 'attributed values': providing first-hand experience, stimulating interest and motivation in science, giving meaning to learning and its interrelationships, observation and perception skills, and personal (social development)" (Sorrentino and Bell, as cited in Michie, 1998, p. 45). While a variety of reasons exist for field

trips, one still has to ask – is there evidence that children learn during field trip experiences?

There have been a number of studies done on the importance of field trips to student's educational experiences. These studies were chosen as a representative sample of such studies to provide an example of the extent to which field trips have been shown to be beneficial aspects of educational experiences. One study suggested that children's field trip experiences increased learning and confidence in subject areas compared to classroom counterparts (Munroe, Washburn, Goodale & Wright, 2001). A second study found that field experiences influenced career choices (Nazier, 1983), and finally a third found that these experiences can result in long term memory of both the field trip experience and the concepts explored during the experience (Falk & Dierking, 1997). Field trips to informal learning environments are a valuable learning tool and worthwhile opportunities for classroom teachers to organize for their students.

Munroe, et al. (2001) evaluated a park education program that was created by teachers and federal park employees. In addition to evaluating the design and implementation of the park education program, the researchers were also interested in determining if students learn during a field trip experience, if the experience enhances the prescribed curriculum and if the students learned to appreciate both the cultural and natural resources within the park. The researchers used a variety of methods to evaluate the design of the educational programs that are outside the scope of this research project. To measure the

students learning, curriculum fit and attitudes the authors used a pre and post field trip test given to both an experimental and control group of students. After surveying 600 students, the researchers found that the students in the experimental group were not significantly different compared to the control group with respect to their attitudes toward conservation and stewardship (encouragingly both groups scored these questions positively). However the researchers did find that the experimental group scored significantly higher than the control group with respect to cognition questions that were both broad and conceptual in nature and field trip specific. In addition, the authors also found that participants in the experimental group were significantly more confident in their ability to explain what they learned. The authors concluded that the field trip enhances the school curriculum, helps teachers present the material in a method that is more memorable to the students and create students that are more confident in the knowledge they have acquired.

Nazier's (1993) study commented on the increasing availability of science and technology jobs and the relative low numbers of students entering this field. Citing a number of studies, Nazier identifies a variety of factors that influence students to choose science related fields in post secondary education. While these studies examined the students' choice for entering science-related fields in schools, Nazier investigated the factors that influenced the career choices of practicing science professors at a major research university. Nazier found that almost 9% of the survey respondents identified field trips as a contributing factor to the participant pursuing a career in a science related field. Other influences

include hobbies (26%), family (18%), and natural curiosity (13%). The author also found that participants from the geological and biology departments were more likely to mention field trips than participants from the other departments. Nazier concludes his study by suggesting that providing opportunities for both hands on experimentation to encourage the development of science related hobbies, together with the organisation and implementation of field trip opportunities should be used to encourage students to choose careers in science and technology.

Falk and Dierking's (1997) study investigated the long term impact of school field trips. Most studies reviewed by these authors examined students' short term learning after a field trip event. These authors were interested in the long term memory of students and their participation in primarily field trip activities. The authors interviewed 128 subjects of varying ages using open-ended questions pertaining to the when, where, how, and who of a field trip they participated in as a student in grades one to three. Falk and Dierking found that 96% of all participants could recall a field trip and 98.4% could recall at least one specific topic-related event (as opposed to a memory of the gift shop, for example) of the field trip, while 80.6% could recall more than one specific event from the field trip. These authors commented, "How many other one day school experiences would measure up as well?" (Falk & Dierking, 1997).

Field Trip - Design

Researchers publishing in the educational literature describe a variety of models for designing and implementing field trips. The most recent fieldtrip

design model, summarized by Orion, Hofstein, Tamir, and Giddings (1997), includes the following main principles that are outlined in more detail below: The field trip should be based on constructivist pedagogy; it should occur early in the learning process, and it should minimize the geographical, psychological, and cognitive novelties inherent in new learning activities.

According to Orion (1993) the fieldtrip experience should be process-oriented and based an interactive, process oriented pedagogical approach (as opposed to an experience that provides passive (listening) learning opportunities). In a study completed by Mackenzie and White (1982) three groups of students (same course and teacher) were studied as two groups participated in a field trip and the third, the control group, did not. Of the two field trip groups, one group participated in a more content-oriented approach to instruction; the other group used a more process-oriented methodology. The authors found that the process oriented group had better knowledge acquisition and long term memory than both other groups. They also found that the field trip, content-oriented group did not achieve better results than the classroom only group. This study gives rise to two notions: a content driven field trip is not a better instructional tool than remaining in the classroom; and a process-oriented field trip can provide better learning opportunities than both a content-orientated field trip and a strictly classroom based instruction.

In order to provide a concrete substructure that allows for the building of more abstract concepts, fieldtrips should occur as early in the learning process as possible. The field trip provides "direct experience with concrete phenomena

and materials" (Orion, 1993) that will allow students to transition from primary concepts to secondary concepts (Novak, 1976). Concrete experiences are thought to provide a reference point for students to build upon while completing activities that require higher order thinking (Mackenzie and White, 1982).

Finally, maximizing learning during the fieldtrip requires adequate preparation. Orion and Hofstein (1993) identified the "novelty space" of a field trip as a major distraction from learning, and argued that adequate fieldtrip preparation requires teachers (and facilities) to account for these factors. This novelty space includes: a geographical, psychological, and cognitive novelty. The notion of geographic novelty is summarized by Orion (1993) in that a student's ability to conduct cognitive activities during a field trip is influenced by and actuality inhibited when there is a lack of familiarity with field trip facility. Psychological novelty refers to student's knowledge of the type of field trip and subsequent behavior expectations (Orion 1993). The cognitive novelty refers to the fact that students should be prepared for new cognitive tasks required during the fieldtrip event prior to the field trip rather than learning this skills while at the field trip facility (Orion, 1993). Teachers and field trip facilitators should ensure that the geographic, psychological and cognitive novelty factors should be explored before commencing a field trip experience.

Thus the field trip presents itself as a unique learning environment. Adequately designed, planned and executed, a field trip can enhance learning and complement the classroom activities.

Field Trip – Factors Influencing Teacher Participation

The second part of this study investigates the factors that influence teachers to organize field trips for their classes. Two studies formed the basis for this part of the research project: Michie (1998), *Influences on Secondary Science Teachers to Undertake Field Trips;* and a study undertaken by Anderson and Zhang, (2003) *An Investigation of the Factors Influencing K-7 Teacher's Decisions to Make Field Trip Visits to Science World BC.* The findings of both are reviewed briefly below.

Michie's (1998) study used qualitative methodologies (open-ended surveys and interviews) to investigate the factors that influence field trip participation. He found that teacher's participate in field trips to provide students with "a hands-on, real life experiences which they would not be able to have in the classroom or laboratory" (Michie, 1998., p. 63). Michie (1998) also found that the degree to which the field trip is related to the curriculum is extremely important to classroom teachers, and as such is also a determining factor. Other factors that inhibitors teachers from participating in field trips is the teacher's individual confidence in their ability to plan a safe experience for their students; the support from other teachers, and concerns regarding the potential for student misbehavior while they are out in the community. In addition, Michie (1998) found that the cost of field trips is often a limiting factor particularly when the cost of transportation is coupled with the cost of facility admission. Finally, administrative issues were identified as factors that inhibit field trip participation,

particularly those that increase the time and effort required for teachers to organize and plan field trips compared to planning regular classroom activities.

Anderson and Zhang (2003) were commissioned by a local field trip facility to investigate the factors influencing elementary teachers to plan and implement field trips. These authors found that the factors that influence teachers to plan a field trip include: the field trip must be related to the curriculum, there must be value and/or enjoyment for the students, the cost of participation (facility fee) and transportation, pre-field trip organization and pre/post field trip activities, and knowledgeable, competent staff. Organisational time and scheduling factors were also identified by participating teachers as factors that prevent them from participating in field trip activities.

Both of these studies identified many factors that influence teachers to participate in field trip activities. As such these factors were included in the second part of the survey that will investigate the factors that influence teachers in the Greater Vancouver (BC) area from participating in field trips.

Learning Environment Research

Schools and educational programs have long been studied from an external observer's perspective. More often than not these studies involve outcome based testing: with researchers evaluating how the students' knowledge compares to identified learning outcomes. While useful as a study tool, comparing students "success" in attaining differing levels of learning outcomes does not measure many aspects of a school setting; the social, psychological and physical environment are largely ignored within these methods.

The idea that learning is influenced by the perspective of the learner arose out of psychology studies and findings of Lewin (1936). Murray (1938) added to Lewin's idea of examining what motivates people to act and subsequently introduced two terms: alpha press and beta press. Alpha press refers to the observations of an environment by an external researcher/observer while beta press refers to the observations of an environment from someone participating in the experience. This concept was developed further in the mid 1950's by Stern, Stein and Bloom (1956) who identified that not only does the perception of people participating and observing differ, but in their perception as individuals can differ from their perceptions as a member of a group. The idea that different perspectives exist and that they can provide meaningful and very different observations of events ultimately led to the development of learning environment studies.

In the late 1960's researchers started to investigate these factors and introduced the term "learning environments", a phrase designed to included a large variety of factors that influence learning – including factors such as the physical arrangement of the classroom, the attitude of the teacher, and the instructional pedagogy. In an attempt to overcome inherent biases of an external observer taking notes in classrooms and the limited nature of outcome based testing, a relatively new, and increasingly more common method of evaluating the learning environment in its entirety is from the student or teacher's perspective. According to Fraser (1998 a), students and teachers can provide useful information with respect to an education setting due to the participatory

nature of their roles, to their experience with a variety of learning situations and to the fact that their impressions are formed over a longer period of time.

The most popular method of gathering quantitative data from both teachers and students is through the use of learning environment questionnaires or inventories. The use of such instruments to measure participants' (teachers and students) perspectives became popular after Herbert Walberg developed the *Learning Environment Inventory* in 1968 in an effort to gather information from students involved with Harvard Project Physics; a new curriculum developed in response to the Russian/American space race of the early 1960's. Walberg's curriculum based inventory, combined with Rudolf Moos' social climate scales and the subsequent development of the *Classroom Environment Scale* led to a vast array of studies that attempted to correlate the physical, social, emotional, interpersonal experiences and curriculum studies with learning.

A variety of instruments have been developed to measure the variances and subsequent attributes of learning environments specific to the age of the participant (elementary through university) and ranging from inventories specific to individual student experiences (Individualized Classroom Environment Questionnaire, My Class Inventory, What is happening in this Classroom); college and university scales (College and University Classroom Environment Inventory); to one specific to a Science Laboratory (Science Laboratory Environment Inventory). All of the instruments involve a series of scales (categories) that are then comprised of varying number of statements to which the survey participants respond using a Likert scale. The level of wording and

topics of the statements varies depending on the age of the students and the objectives of the study.

In order to ensure reliable results (and allow for appropriate conclusions to be drawn from the instruments), the use of these inventories requires researchers to validate both the readability of the survey and the correlation of each statement to the overall response within the scale. The expected high correlation of each statement within a scale and low correlation of results between scales is measured using the Cronbach Alpha and Discriminant Validity statistical analysis. A strategy that has been used to allow researchers to ensure that participants are reading each individual statement (as opposed to circling answers randomly) is to reverse the polarity of a few of the statements. The researcher can then measure the degree to which the respondent replied oppositely to these negative statements compared to the other statements, thus confirming that they were reading the survey when answering the questions.

Over the years the learning environment instruments have evolved to maximize the conclusions being drawn while minimizing the time involved in participating in the survey. Some of these changes include decreasing the number of statements in each scale within the learning environment instrument to decrease the time required to complete the survey. Other changes include changing the wording of statements to improve clarity. For example, researchers have found that there is a perceptual difference (Fraser 1998) in the actual experience of participants versus their 'preferred' or ideal experience. A slight

change in the wording of the statements allows for a more accurate response from the participant. For example:

- Ideal/preferred:
  A field trip should provide opportunities for students to ask relevant questions

- Actual:
  The field trip provides opportunities for students to ask relevant questions.

This area of learning environment research has been expanded to measure whether student outcomes are influenced by the degree to which the actual classroom environment meets the individual student's preferred environment. While there was a positive relationship between the degree to which the students met the prescribed learning outcomes while in their preferred environment, Fraser (1993) comments that this does not mean that individual students should be moved to an environment that matches their preferred environment, but rather the degree to which learning outcomes are met by the class as whole may be increased by changing the classroom environment to be more in line with the classes' preferred experience.

The design of learning environment studies has evolved to include both quantitative and qualitative research methodologies. First introduced by Fraser (1999) the combination of research techniques allows for a collection of a large volume of general data to look for common trends, and a collection of more specific data (qualitative) to provide more insight into the quantitative and allowing triangulation for better conclusions.

Scope of Learning Environment Research

As an increasingly popular means of studying the intricacies of learning, the study of learning environments and the use of instruments (surveys) as a research tool is limited only by the imagination of the researcher. This section reviews the immense variety of types of research that have used the methodologies found in the learning environment research field to provide an overview of the field and the commonalities found within these studies. Finally, three exemplars of research studies that have used learning environment instruments will be reviewed in more detail; these range from the effect of the relationship between the student and teacher, the learning environment in technology-rich classrooms, and the use of learning environment research to create positive learning experiences. In addition to the wide range of topics that have been studied using learning environment instruments as a research technique, the exemplars will also illustrate that this is a research methodology that is being used around the world.

Learning Environment studies are diverse yet have a common goal of providing relevant feedback with respect to the learning environment experienced from the perspective of the participants. In all the studies, the purpose is to provide meaningful feedback that can be used to improve the learning environment and thus the learning that is taking place.

Inherent in the continued growth of this field has been the creation of numerous questionnaires that have undergone validity testing and can be used for a wide range of topics (Fraser, 1998 b). This has allowed for the field of learning environment research to branch out and include studies in the

examination of the relationship between cognitive and affective learning outcomes with classroom environment characteristics, in the use of learning environment instruments in curriculum change and educational innovations; as a means of initiating change within individual teacher's classrooms, and as a means of studying more specific and specialized areas of research.

One use of learning environment inventories is to integrate traditional measures of learning (the degree to which cognitive and affective learning outcomes are met) with the classroom environment. The term "classroom environment" refers to the classroom characteristics; these can include factors such as teacher personality, class size, age/sex of students, type of school, psycho-social interactions between students, the physical organisation of the classroom, and class size. For example, there have been many studies (summarized by Fraser, 1986) that have found better outcome-based achievement scores when students perceive the class is organized to minimize the concepts in the scales Disorganisation and Friction and maximizes the concepts in the scales of Cohesiveness, Satisfaction and Goal Direction. In summary, this type of research has found that there are in fact positive relationships between student perceptions of their learning environment and their academic achievement, attitudes and even self esteem (Fraser, 1998b).

Learning environment research has also been used to measure the effects of curriculum change or the implementation of educational innovations. For example Fraser (1979) and Fraser and Teh (1994) found that the implementation of different curriculum can result in a more satisfying learning environment. In

addition, a study in Korea by Lee and Kim (2002) summarized learning environment studies done using both pre-existing and newly constructed inventories to measure students' perception of their learning environment after the implementation of a new curriculum. This new curriculum included more innovative methods of instruction (constructivist methodologies, more laboratory exercises etc). Empirical support for the implementation of this new curriculum was found as the researchers concluded that students were more positive about their learning environments after the implementation of the new curriculum. Thus learning environment research methodologies can not only be used to identify the relationships between learning and the conditions of the classroom setting, they can also be used as a measure of the students' perceptions after a change in curriculum implementation.

In addition to these broad areas of learning environment research, this type of research has also been used in much more specific application of educational research ranging from providing a means to improve individual teacher's classrooms to providing a means to investigate specific types of learning environments.

For example, Fraser and Fisher (1986) used learning environment research to determine the actual and preferred environments of students in a science class in Tasmania. The data collected provided feedback information for the classroom teacher and allowed for personal reflection and perhaps if needed, a change in the characteristics of the classroom learning environment to better meet the preferred characteristics of the students. Fraser and Walberg (1993)

argue that learning environment research methodology should be included in pre-service teacher education. One reason for this is to provide teachers with an overview of what types of characteristics are included in learning environment studies, characteristics that new teachers may not have considered as inhibitory (or enhancing) to learning. The second reason for including learning environment methodologies in pre-service teacher programs is provide a means for new teachers to gather data to evaluate and reflect on the classroom learning environment they are creating in their individual classrooms.

Learning environment research can also be used to investigate more specific types of learning environments. Constructivist approaches have become increasing popular as a means of delivering curriculum content, the degree to which a teacher is using these methodologies can be measure using a specifically created *Constructivist Learning Environment Survey* developed by Taylor and Fraser (1991) (as cited in Fraser 1993). Similarly, the increased use of information and communications technology (ICT) in a variety of educational settings has resulted in the construction and use of a *Computerized Classroom Ergonomic Inventory and Worksheet* to evaluate students' perceptions of these learning environments. Another example of the range of surveys available to measure more specific learning environments is the use of the *Cultural Learning Environment Questionnaire (CLEQ).* This instrument has been used to determine the influence of culturally sensitive factors in science learning environments (Fisher & Waldrip, 2002) and the resulting associations between

these cultural factors and students' cognitive abilities and affective perceptions of their classrooms.

It is evident from the examples listed above that learning environment research has been used to investigate a variety of educational concepts. In order to provide a more detailed perspective of what can be included in learning environment research, three learning environment research studies are summarized below.

Learning Environment Exemplars

The student teacher relationship has been studied extensively by Theo Wubbels over a number of years and involving students from a number of different countries. In one particular study *Teacher-Student Relationships in Science and Mathematics Class* (Wubbels, 1993), he explores the question of whether student learning is affected by the relationship between student and teacher. An influencing parameter of this question is the teachers' opinion of the "best" methods to relate to students, an opinion that is most likely as varied as the number of teachers poled. These interrelationship methods range from a disciplined class that does not allow for much freedom and includes a more autocratic teaching style, to a classroom that focuses on the student responsibilities for learning in a more enjoyable atmosphere. In his study Wubbles specifically explores the questions "What preferences do students have about their relationships with their teachers, How would teachers like to behave towards students? And What teacher-student relationships are common in Australian science and mathematics classrooms", (Wubbels, 1993).

Wubbles (1993) used the Questionnaire on Teacher Interaction (QTI) that uses a two dimensional description of teacher/student relationships. One dimension includes a range of dominance to submission while the other dimension ranges from cooperation to opposition. Each of the categories are further divided into two opposites, for example the dominance characteristic was divided into Strict Behavior and Leadership behavior. The end result is 8 categories: Dominance (Strict Behavior, Leadership Behavior), Cooperation (Helpful Behavior, Understanding Behavior), Submission (Uncertain Behavior, Student Responsibility/Freedom Behavior) and Opposition (Dissatisfied Behavior and Admonishing Behavior). The instrument uses a range of six to eight statements for each category and exists in a multitude (both student and teacher; ideal and actual) of forms. Wubbels surveyed secondary school students with respect to their perception of their science and math (actual) teachers. In addition they also asked students to complete the instrument commenting on the behavior of their best (ideal) teacher. In addition to surveying the students, Wubbles also asked teachers to complete the survey based on their perceived actual behavior and the behavior of what they consider to be an ideal teacher. Some of Wubbels findings include that from a teachers perspective they (the teachers) do not reach their ideal. From the students' perspective, Wubbles found that the best teachers are strong leaders, more friendly/understanding and less uncertain, dissatisfied and admonishing. The author does acknowledge that there are some discrepancies between students' perceptions of an ideal teacher; some students prefer a strict teacher, others prefer learning environments that

are more free and involve more student responsibility. Wubbles also references an earlier study that found that generally speaking, children in the lower grades appreciate more structure, while students in higher grades prefer a more flexible approach.

This study indicates the power of learning environment inventories. It is extremely valuable to be able to compare not only the ideal and actual perceptions of the teacher, it is also important to consider the viewpoint of the students. This type of survey is useful for classroom teachers to use to evaluate their perceptions of themselves as a comparison to the perceptions of the students in the classroom. At the very least, knowledge of discrepancies between the teachers' and students' perceptions provides opportunities to create a more desirable learning environment for all participants.

In addition to interpersonal relationships and their influence on learning, learning environment instruments also allow researches to examine the interrelatedness of physical settings, psychosocial factors and learning for students in computerized classrooms. Zandvliet (2002) used a large sample size, the *What is Happening in this Classroom* (WIHIC) questionnaire and a combination of qualitative and quantitative methodologies to evaluate the psychosocial aspects of a "high tech" learning environment. He focused on the scales Cohesiveness, Involvement, Autonomy, Task Orientation and Cooperation "as they are consistent with the goals of reform efforts aimed at individualizing curriculum and instruction and increasing student interactions" (Zandvliet, 2002).

The data collected for the built (physical) environment was interpolated with the psychosocial and satisfaction categories.

Zandvliet (2002) further investigated this physical setting and psychosocial/satisfaction relationship by using qualitative data from a subset of the original classrooms. This case study approach allowed him to use a more detailed analysis of the classroom environment including physical layout, classroom task analysis (student and teacher) and interviews to further examine the influence of physical layout on student satisfaction.

This study shows the value in learning environment research, including qualitative and quantitative methodologies as a means of measuring the effect of a variety of learning environment characteristics on students' perceptions. This should encourage educators to not only consider the physical arrangement but the pedagogical approaches used when teaching in this and other specialty areas.

In addition to examining the interpersonal student-teacher relationship and its influences on learning and the effect of physical setting on the psychosocial factors and satisfaction of student in a high tech classroom, learning environment inventories have also been used to assist in the improvement of science education in Taiwan. Yang, Huang and Aldridge (2002) completed a study titled *Investigating Factors That Prevent Science Teachers From Creating Positive Learning Environments in Taiwan*. The authors used the *What is Happening in this Class* (WIHIC) questionnaire (after translating and modifying it for their

audience), an attitude scale, and two qualitative methods (interviews and classroom observations) in their study.

After translating the original WIHIC into Mandarin and back translating into English to ensure consistency in meaning and concepts, the survey was administered to 25 biology and 25 physics classes at the junior high school level. The researchers found that the students generally had positive attitudes towards learning. However, the students also indicated that they did not perceive their science classes as investigatory or encouraging involvement. When the authors explored this further with respect to what is influencing/inhibiting the learning environment they found that the cultural factors seem to influence the students' experiences. They subsequently identified two themes: 'educational aims and the nature of the curriculum' and 'pressures experience by teachers' (Yang, Huang & Aldridge, 2003). Within the educational aims, it was apparent that the importance of examination results and the highly competitive nature influenced the classroom environment and that the "social and emotional aspects of the student's development were generally considered to be the responsibility of the family and wider community rather than that of the school" (Yang et al., pg. 223, 2003). The efficiently driven model of teacher-centered instruction was reinforced by the critical questioning of more student-centered approaches by staff, parents and students alike. The pressures experienced by teachers are directly related to the content driven aims identified in the first theme. Teachers consistently indicated that they felt pressured by the parents, principal and other teachers in terms of the instructional strategies.

The use of the learning environment instruments in this study is an excellent example of how a relatively new research technique can identify cultural challenges that perhaps are inhibiting the creation of an ideal learning environment. The authors conclude with the desire that future research into learning environments in Taiwan will "foster positive attitudes and a love of learning" (Yang et al., pg 237, 2003).

As evident from the exemplars outlined above, the use of learning environment instruments is wide spread; encompassing a range of learning characteristics, pedagogical practices and has even involved the measure of the influence of culture on learning. It is not hard to imagine that learning environment pedagogy can be applied to the study of field trips, or distinct activities outside of the classroom that are generally meant to complement the classroom learning environment.

The Field Trip as a Learning Environment

Research into field trip pedagogy has progressed from examining the purpose of field trips and assessing the factors that maximizing learning including overall design, to an analysis of the fieldtrip experience as a learning environment from the perspective of the teacher and the student. A positive learning environment encompasses virtually every aspect of the experience including: physical environment, teacher-student relationships (classroom rules, helpfulness, fairness, level of care, etc), relationships between students, classroom "instruction" techniques (pedagogy), student satisfaction, non-verbal language, and even how the environment relates to students meeting prescribed

learning outcomes (Fraser, 1998). These factors are found within every learning situation and can be examined in the context of the field trip as an informal learning experience.

Orion et al. (1997) developed a unique inventory (Science Outdoor Learning Environment Inventory – SOLEI) for assessing outdoor science activities from the students' perspective. This inventory is comprised of 7 scales, 5 of which were based on the Science Learning Environment Instrument (SLEI) developed in Australia, although altered for outdoor education. Two additional scales (Teacher Supportiveness and Preparation/Organisation) specific to the outdoor learning environment were ultimately removed from the SLEI but were deemed to be critical to the outdoor learning environment and were added to this inventory. Field trip literature will be examined to provide evidence that the scales in the SOLEI (Environment Interaction, Integration, Students' Cohesiveness, Teacher Supportiveness, Open-Ended ness, Preparation and Organisation and Material Environment) are in fact important as a measure of the learning environment created during a field experience. This section of the literature review is organized by the scales, under each scale supporting field trip literature is identified and supported with an explanation.

Important Components of the Field Based Learning Environment

Environment Interaction

This category, according to Orion et al. (1997) is designed to measure the "extent to which students are actively involved in learning through interaction with their peers and their surroundings" (Orion et al., 1997, p. 165). The focal point of

this category is the reference to an active experience during the field trip; as opposed to a passive listening experience. Statements in the inventory measure the children's interactiveness with each other along the theme of encouraging discussion, expressiveness and outgoingness, ideas that are supported in field trip literature (Orion, 1993).

It is not surprising that students that are active (playing games, catching, looking, searching, chasing, touching and acting) will be more likely to remember the concepts embedded in the fieldtrip exercise. Studies of environmental programs have found that "active experiences aid in recalling aspects of an interpretive program...an experience that is tactile and exploratory will be more memorable than a didactic/passive program" (Knapp and Poff, 2001, p. 63). Not only does the memory of students improve with a more active program, Orion et al. (1997) found that when comparing perceptions of students in active versus passive fieldtrips the perceptions of students in the active experience were significantly more positive throughout all aspects of the inventory categories.

A subset of the activeness of the fieldtrip is the idea that during the fieldtrip the students should be involved in or using a phenomenon that cannot be effectively learned in the classroom. Orion, in an earlier paper (1993), wrote "students could view slides of a dune...in the laboratory, but only climbing the back and gliding down the steep front slope ...during the field trip, [can we] provide them a direct sensorimotor experience of learning about the dune and its structure" (Orion, 1993, p. 325). He summarizes this thought by concluding the "phenomena at the site should be clear enough 'to speak for themselves'" (Orion,

1993, p. 327). Millan (1995) described how the level of attentiveness improved when the children were given tools and allowed to participate in an archeological dig, compared to their attentiveness during a visual presentation of a dig. In other words, a fieldtrip should not be an experience that can be replicated in the classroom.

The inclusion of environmental interaction, or the level of interaction between students and the environment in the SOLEI inventory is supported by Orion's earlier paper in which he states, "realizing the maximum educational impact of a fieldtrip depends upon the optimal use of concrete interactions between students and the environment" (Orion, 1993, p. 326). It should not be surprising that the idea of active, hands-on participation is an important attribute of a field trip learning environment as it has also been identified as an important attribute of regular science classrooms (Laurence Hall of Science as cited in Belk at al., 1998).

Integration

Increasing and improving student interactions with the environment are important, but to justify field excursions the experience must be connected with the classroom learning environment. The integration category of the SOLEI identifies the "extent to which the outdoor event is integrated with the indoor learning" (Orion et al., 1997, p. 165). The educational literature supports the interrelatedness between the two environments (classroom and field); it also supports the idea that the benefits of a fieldtrip experience can be maximized when the fieldtrip occurs early in the particular unit of study.

Various authors have indicated that the field experience needs to be correlated with what is happening in the classroom (Vinci, 1969; Folkomer, 1981; MacKenzie & White, 1982) and that "fieldtrips are beneficial especially when the teacher combines [the] concrete learning experience as an intermediate step, with higher levels of cognitive learning" (Orion, 1993, p. 325) that continue in the classroom. This allows the field trip experience to "set the stage" for future connections back in the classroom.

There are a number of studies that support the interrelatedness between the classroom and the field activities in terms of the timing of the field experience. Millan (1995) supports the implementation of the fieldtrip at the beginning of the unit as this coincides with Piaget's discoveries that cognitive development proceeds from the concrete to the more abstract. The early placement of a fieldtrip is also supported by "The Learning Cycle" strategy (Karplus & Lawson, as cited in Orion, 1993) where learning is constructed on three parts in terms of a

unit that involves a fieldtrip: the preparatory unit (providing the basic and background knowledge necessary for the experience, the field trip (the central unit) which prepares students for the final more abstract summary portion of the unit. During the validation of the learning environment instrument Orion et al. (1997) found that the students' perception of the field trip was more positive if the field trip was used as an introductory, investigative activity as opposed to a confirmatory, summative exercise.

This is contradictory to Nespor's study (2000) which found that field trips were often scheduled "clustered ...at the end of the term when teachers had come to stopping points in their regular in class units" (Nespor, 2000, p. 29). It should be noted that there is a reference with this comment that teachers often have little control over when the field trip takes place due to limiting factors within the school organisation and/or administration.

Integration of the field trip to the classroom activity is a highly desirable component of a successful field experience; it is similar to the integration from one activity to another from morning to afternoon and over consecutive days within regular classroom practice. More of an issue is the placement of the field experience with respect to the classroom studies, with most authors believing that the field trip should occur in the beginning of the unit of study (Millan, 1995, Orion, 1993)

Students' Cohesiveness

This category of the learning inventory measures the "extent to which students help and are supportive of each other" (Orion et al., 1997, p. 165).

Statements in the inventory include key words that identifies whether the children depend on, collaborate with, learn from and get to know each other during a field trip excursion.

One paper examining the benefits of a field trip experience referred to students who become more social in a field trip setting (O'toole, as cited in Millan, 1995) compared to the classroom environment. Millan continues this thought by describing students as "becoming positively animated learners while on fieldtrips" (Millan, 1995, p. 124). Similarly, Nespor (2000) describes the field trip experience as an opportunity to create discussion and interaction as it "transport[s] young people off school grounds and allow[s] them to interact informally with out the stringent monitoring and evaluation characteristic of regular school activities" (Nespor, 2000, p. 29). In an examination of factors that influence teachers to plan and implement fieldtrips, Michie found that "most teachers felt that student's behavior improved while they were on fieldtrips and that improvements could continue afterwards into classroom relationships" (Michie, 1998, p. 49). These references provide evidence that the active, collaborating opportunities found in field experiences positively change the dynamics of the classroom.

The very nature of the active, involved characteristic of field experiences (referred to in the **Environment Interaction** section, pp 38) results in an increase in student interactions with each other. Few studies in the literature identified the purpose of these interactive activities as a means of fostering student relationships, but it is not hard to imagine that this cohesiveness does

develop within active, student oriented activities. There are numerous comments from students in the literature indicating that a field trip was enjoyable, including it was "fun, awesome, neat and cool, we got to learn while we play games" (Knapp & Poff, 2001, p. 61) although there doesn't appear to be an explanation associated with these comments. For example the students did not mention that it was fun **because** they got to play games; **because** they got participate in a hands on activity, or **because** they got to interact with their friends. Perhaps this causal relationship of fun, learning and group cohesiveness are indistinguishable to children unless led through a discovery or explanatory discussion.

Teacher Supportiveness

Very little was found in the educational field trip literature to support the importance of teacher supportiveness, or the "extent to which the teacher/instructs, is helpful and shows concern for all students" (Orion et al., 1997, p. 165). There is reference in one review of fieldtrip experiences that outlines the human factor and the importance of a guide/instructor that "handles children well, is knowledgeable and personable" (Millan, 1995, p. 138). Millan identifies this feature as one that is largely beyond the control of the classroom teacher, yet critical to the overall field trip experience. It is not hard to extrapolate the findings within *The Teacher Factor in the Social Climate of the Classroom* (Wubbels & Brekelman, 1998) that identified the importance of the attentiveness, listening skills, body language, friendliness and a willingness to help as characteristics of a classroom teacher that contribute to a positive learning environment in the classroom. These characteristics are equally important

attributes of an educator in an informal learning environment. The conclusion by Wubbles and Brekelman (1998) states "teachers should strive to establish relationships characterized by high degrees of leadership, helpful/friendly and understanding behaviors. In order to succeed, teachers' nonverbal behaviour ...should guarantee good visual contact, and should avoid...disorderly climates" (Wubbles and Brekelman, 1998, p. 577). The author would argue that this statement should also apply to field trip learning environments.

Open-endedness

Included in the learning inventory is a measure of the "extent to which the outdoor activities emphasize an open-ended, divergent and individual approach" (Orion et al., 1997, p. 165). Or, in other words, the extent in which children are given the opportunity for self discovery, to follow their own particular interests as they relate to the current area of study. This section is supported by constructivist theory, described by researchers as an environment that:

> "assumes that each individual brings varied prior experiences and knowledge into a learning situation and that these shape how that individual perceives and processes what he or she experiences. The combination of prior experience and the new experience result in learning, but the resulting learning is unique for each individual, situated within the context in which it was learned." (John H. Falk, Theano Moussouri & Douglas Coulson, 1998, p. 110)

Generally, in the author's experience, field trips tend not to encourage individuality as students often fill in a worksheet or participate in prescribed organized activities as a large group. Perhaps this is because of the limited time at the fieldtrip site, the lack of experience of the facility staff in organizing these types of opportunities (either in knowledge of how students learn, or lack of knowledge in how to supervise children to maximize learning), the lack of staff

and/or facilities in which to organize these activities, or the lack of teacher experience in developing these opportunities in the classroom (Michie, 1998). It may be more reasonable for the facility to provide a similar experience for all children that can then be internalized and developed on a more personal level (e.g. using journals) back in the classroom.

Preparation and Organisation

This section of the learning inventory evaluates the "extent to which students were prepared for the field trip in terms of expectations and organisation of the event" (Orion et al., 1997, p. 165). Preparation for a fieldtrip has been extensively studied and is summarized in numerous fieldtrip studies including "Novelty of Field Setting" (Orion & Hofstein, 1994, p. 1099.) where novelty refers to the unique characteristics of the field trip side that may interfere with learning. The authors identified three categories of novelty factors: cognitive, geographic and psychological. Adequate preparation prior to the fieldtrip ensures that these novelty factors are minimized in order to maximize learning during the experience.

Cognitive novelty factors refer to the children's comfort, or lack thereof, with concepts and skills required during the field trip. If students are expected to learn and use new skills and concepts during their field trip experience, the authors suggest that these ideas should be introduced prior to the excursion. This enables the children to apply the skills and concepts appropriately during the field trip without sacrificing their time at the facility to learn a skill; time that could be better spent applying the concept to the current situation. This idea is

supported by Dierking and Falk (1994) in their conclusions that individuals with the "prerequisite science knowledge increases learning" during a field trip experience.

Another novelty factor that prevents optimal learning is the students' lack of familiarization with the area being visited. Westbrook (2001) supports the idea of the geographical and physical novelties and suggests that a prior visual experience for the teacher is critical as "integrated education between classrooms and informal education sites is dependant on teacher familiarity with exhibits and programs" (Westbrook, 2001, p. 42). Students also benefit from a pre-trip familiarization (Anderson 1994; Anderson & Lucas 1997) as "students familiar with field trip site demonstrated a significantly higher learning" (Griffin & Symington, 1997) compared to students that were not exposed to a pre-trip familiarization. One option may be for the teacher to visit the facility during a professional development day, during the summer, or participate in facility-implemented professional development workshop designed to facilitating learning in informal setting (Griffin & Symington, 1997). For children, it is recommended that the facility provide a short visual overview of the fieldtrip experience, outlining the most novel features for children to become accustomed to, at least on some level, prior to the field trip experience.

Finally, children experience psychological barriers to learning in an informal field trip environment because through the eyes of the students, field trips are generally thought of as a more social and adventurous activity, rather than a learning opportunity. While social interactions are important (see **Student**

Cohesiveness, pp 41), one needs to ensure that these are appropriate social interactions that foster learning. Children understand the difference in behavioral expectations under different circumstances (e.g. group projects versus individual presentations) and can adjust their behavior accordingly if time has been taken to explain and practice learning in social groups prior to the fieldtrip.

There are preparatory or logistical factors that do not influence the perception of the learning environment from the student's point of view but are involved, and may limit, fieldtrip planning from a teacher's perspective. Instead of selecting a field trip experience based on whether it provides an optimal learning environment, the teacher may choose a facility based on one or a combination of the following factors: student safety and security, travel time, school administrative requirements, fellow staff support, teacher unfamiliarity with site, teacher incentives, facilities (including weather dependency), lack of curricular time, fear of student misbehavior, cost of excursion, and student enthusiasm.

Material Environment

This category measures the students' perception on the "extent to which students are provided and use adequate learning materials for the outdoor learning event" (Orion et al., 1997, p. 166). References were found to indicate that facilities need to provide materials for use during field trip itself (Orion, 1993), however far more references were found for supporting material for use back in the classroom. One study indicated that worksheets can often be seen as busy work (Michie, 1998)), and that their "true value is enhanced when they are used as a focus on subsequent work" (Michie, 1998, p. 45). This author also identified

comments from teachers indicating that the availability of resources and resource people was a factor in undertaking fieldtrips. According to Orion (1993), "a teacher should develop learning materials that both prepare students for the trip as well as guide them though it" (Orion, 1993, p. 327), however the author would argue that it is the field trip sites responsibility to at least assist in this regard.

In conclusion, Nespor (2002) cites literature by a variety of authors (Cox 1993, Orion and Hofstein 1994, Priest and Gilbert 1994, Confar 1995, Griffin and Syminton 1997) that suggests: "successful field trips require careful planning and coordination, preparatory activities, [and]...post activities that allow students to draw on their experiences at the site" (Nespor, 2002, p. 29).

The integration of field trip literature with learning environment theory illustrates that the seven scales found in the Science Outdoor Learning Environment Instrument are indeed important when considering an ideal field trip. As such, all seven categories were included in this study.

Chapter 3 – Methodology

To include the benefits of both methodologies to answer different research questions in learning environments research, this study was comprised of both quantitative and qualitative methods. Quantitative methods allow researchers to gather general data from a large number of respondents and are useful in determining broad trends within a study area. Quantitative data in this study was collected using a paper and pencil instrument comprised of a series of 5 point Likert scales. Qualitative data allows respondents to provide a more detailed response, expanding on their personal experiences. Qualitative data was collected using three formats: space for teachers to provide comments next to each statement in the quantitative section of the survey; open-ended questions within the survey; and follow-up interviews. The combination of qualitative and quantitative study methods allows researchers to benefit from the advantages of both types of methodology (Fraser, 1999)

The survey for this study were developed from primarily three sources: *The Science Outdoor Learning Environment Inventory* (Orion et al., 1997), a paper written by Michie (1998), *Influences on Secondary Science Teachers to Undertake Field Trips* and a study undertaken by Anderson and Zhang, (2003) *An Investigation of the Factors Influencing K-7 Teacher's Decisions to Make Field Trip Visits to Science World BC.* The design of the learning environment instruments – *Characteristics of an Ideal Field Trip* section of the survey was

based largely on Learning Environment Theory using the SOLEI and asked teachers to identify attributes of an ideal field trip; The design of the supplemental survey – *Factors Influencing Teachers to Organize a Field Trip* used the categories found within the SOLEI and the results of Michie (1998) and Anderson and Zhang's (2003) research to generate a list of factors that may influence teachers to organize a field trip. Survey participants were then asked to identify the degree to which each of these factors influences their decision to book and organize a field experience. The Open-ended section allowed for the collection of quantitative data to complement the information found in the first two parts of the survey, while the Demographic section provided teachers with an opportunity to provide demographic (teaching level, number of years teaching, current district) information. A copy of the survey can be found in Appendix A – Attributes of Field Trips.

Design of the Learning Environment Instrument - Characteristics of an Ideal Field Trip

There were a number of alterations made to the original SOLEI to make the survey more suited to this particular study. The first change that was made was to reduce the number of statements within each category (Environment Interaction, Integration, Student Cohesiveness, Teacher Supportiveness, Open-endedness, Preparation and Organisation, Material Environment) to five (from up to nine statements). This ensured that the survey provided an adequate number of statements within a category for valid research yet not be too cumbersome for teachers. The second alteration to the survey involved changing the wording of

the statements to reflect the teacher's perspective rather than the students. In addition, the wording was changed to ensure that the teachers were commenting on a preferred (or ideal) field trip design. This involved preceding each category of statements by one of the following leading statements: an idea field trip includes, an ideal field trip provides, during an ideal field trip, and an ideal field trip. Thirdly, the original SOLEI included the category titles followed by the statements for each category. These labels were removed from the survey to prevent teachers from drawing conclusions with respect to the category title. In addition, the statements within each category were randomized in an attempt to prevent participants from feeling as though they had already answered similar questions. Before randomizing the statements from each category were labeled with a letter from a-f at the end of each statement for data analysis purposes. The last change to the original SOLEI involved the removing of the identification of the reverse (negative) statements. In each of the original categories at least one statement was negatively worded, requiring an answer opposite to the other statements in the category. A negatively worded statement should result in an opposite Likert rating compared to the other statements in the category. These were included in the survey to ensure that the respondents were reading and responding to the survey appropriately.

A five point Likert scale was used in this section of the survey, with the scale ranging from strongly agree (1) to strongly disagree (5). Each statement has a comment section next to it, allowing survey participants to provide comments on each specific statement. This provided an opportunity to solicit

qualitative data in addition to the quantitative data for each statement within the survey.

These changes were implemented to ensure the survey met the requirements of the research objectives, provided a tool to analyze the research questions, and addressed concerns with respect to the time required for teachers to complete the survey.

Design of the Supplemental Survey – Factors Influencing Teachers to Organize a Field Trip

Survey participants were asked to consider a variety of field trip characteristics and select the degree of importance for each of these when organizing a field experience using a five-point Likert scale (ranging from Very Important to Very Unimportant). Comment space was also provided in this section of the survey to provide an opportunity to collect qualitative data to complement the quantitative data collection. The characteristics included the seven categories found within the SOLEI, in addition to logistical factors identified in both Michie (1998) and Anderson and Zhang's (2003) papers as impediments to field trip organisation. A description of each characteristic/attribute was included to ensure the respondents understood the meaning of each category title. This was particularly important for the category titles from the SOLEI, as the descriptions provided precise meanings of these titles using phrases outlined in the original research by Orion et al. (1997).

Inclusion of open-ended questions

This section of the survey involved three open ended questions to solicit additional responses from teachers. These included items such as: What are the characteristics of an ideal field trip – to compliment the learning environment instrument quantitative survey results; What prevents you from taking your class on field trips – to compliment the supplemental survey quantitative results; and Additional Comments – to allow respondents an opportunity to voice other concerns, issues or comments. This section of the survey provided teachers with an opportunity to reflect on their personal experiences with respect to planning and implementing field trip opportunities for their students.

Demographics

Demographic information was solicited from participants in this section of the survey. Teachers were asked to indicate their teaching level, their school district and the number of years teaching.

Focus Group

After creating, but prior to administering the survey, the survey was reviewed by a selection of BC certified teachers. This maximized the readability of the entire survey, ensured that the statements within each category of the learning environment instrument complement one another and confirmed that the survey content corresponds to the survey questions.

Teachers that participated in the focus group were selected from teachers known to the author. A group of 8 teachers (consisting of 2 Kindergarten/Grade

1 teachers, 2 Grade 2/3 teachers, 2 Grade 4/5 teachers and 2 Grade 6/7 teachers) were be invited to critique the survey.

These teachers were asked to independently complete the surveys and examine the wording for clarity. This was important as the statements were originally translated from Hebrew in the SOLEI. In response to the teachers' suggestions from the focus group, a number of changes were made to the draft version of the survey including: the removing of negative words to avoid confusion; the changing of some of the wording of the statement to improve clarity; the removing of statements that were deemed too redundant; and the reduction of the length of definitions to improve clarity.

After completing the survey, teachers were asked to examine their results to determine if they answered questions within a category in a similar fashion. All participants found that their Likert rankings for the individual statements within a scale were similar. The actual survey responses will be evaluated through a Cronbach Alpha and discriminate validity statistical test to show a measure of differentiation between categories and a meaningful relationship within categories.

Finally, the teachers participating in the focus group were asked to provide suggestions with respect to logistical factors that may impede teachers from field trip opportunities. The focus group participants added a number of statements to the logistical factors including: the field trip falls within the hours of a school day and the facility provided complimentary parking.

The focus group session was audio-taped, transcribed and reviewed to ensure that all teachers' responses were noted and if appropriate, included in the final editing of the survey.

Survey Administration

Sample

Survey participants were solicited from a variety of sources, with the goal of receiving 100 surveys completed by British Columbia teachers. Participating teachers were chosen from areas that would ensure the study was relevant to facilities and teachers located within the Greater Vancouver Area. After recruiting some teachers to participate in the survey in more informal methods (teachers attending conferences, individual contacts, Environmental Educators Provincial Specialist Association), the Surrey and Vancouver School districts were approached to seek permission to send the surveys to a selection of schools in order to increase the sample size. Permission was granted to do this and an introductory letter and 3 survey packages (consent form, a survey and a self addressed prepaid return envelope) were mailed to the school addressed to the principal. These were mailed to 50 schools in Surrey and 50 schools in Vancouver for a total of 300 surveys. The total number of completed surveys was 124, with 94 completed by practicing elementary school teachers with varying levels of teaching experience; the remaining 30 were completed by pre-service teachers completing their teacher training at SFU. These sources are summarized below:

Table 1: Source of Completed Surveys

Source	Number of completed Surveys (out of 124)
In-service Teachers	94
Pre-service teachers	30

Note: While all completed surveys were used for the statistical tests to ensure the reliability and validity of the survey instrument, only surveys completed by fully certified (i.e. in-service) teachers were included in the findings.

Survey Instruction

As required by the university ethics committee, all potential participants were given an overview of the study, a description of what would be involved in the study, the benefits and risks to their participation and a summary of the necessary consent parameters (i.e. that participation was voluntary and that participants could withdraw at any time without penalty).

The surveys that were completed by mail (73) were introduced to prospective teachers through the use of an introductory letter. This letter included an introductory paragraph, an overview of the study, a request for the teacher's assistance by completing and mailing the survey back to the author, and finally, contact information if the teachers had any questions. Following the introductory letter was an official consent form (as per university requirements), and the survey. The participants mailed their completed consent forms and surveys to the other using a self-addressed, prepaid envelope that was included in the package.

The remaining surveys (51) were completed after a personal introduction/explanation by the author. Prospective participants were provided

with an oral overview of the survey, followed by a request to assist by completing one of the surveys. If the teacher agreed to participate they were given a survey package which consisted of the consent form and the survey. These participants had the choice of completing these surveys immediately or returning the surveys by mail to the author. A few of these participants took the surveys away to complete at a more appropriate time, and subsequently mailed them to the author.

In order to ensure clarity during the completion of the surveys, both sections of the survey include an objective for that section of the study followed by a brief yet concise instruction statement. The objective for learning environment instrument section of the survey was: "to determine the factors that teachers consider to be important attributes of a meaningful fieldtrip experience." This was followed by the following instruction statement: "Read each question carefully and circle the appropriate rating. Please feel free to provide comments in the area provided". The objective for the Field Trip Participation Section of the survey was: "to determine factors that influence teachers to organize a field trip experience." This objective was followed by the instruction: "Consider each of the following statements with respect to their importance when planning/booking a field trip experience. Please circle the appropriate rating for each statement." The inclusion of the objective and instruction statements are important to ensure that teachers understand the purpose of the study and the context in which they are commenting on the statements included in each section.

Completed surveys and consent forms were numbered as they were received in the mail, the consent forms and surveys were then separated to ensure anonymity during the data entry and analysis process. Surveys were only included in the sample size if a signed consent form was returned with the survey.

Follow-Up Interviews

A random selection of ten teachers that completed the survey were contacted for a follow-up telephone interview. A random selection was chosen as a means of verifying the results from both the quantitative section of the survey and the teacher's responses from the open-ended questions. All respondents originally indicated their voluntary participation in a follow-up interview on the original consent form and subsequently verbally affirmed consent in the introductory minutes of the phone interview. This interview provided additional, and more descriptive qualitative data to supplement the quantitative information gathered from the surveys.

Interviewees were initially asked if they would be willing to answer follow-up questions with respect to a survey they had filled out a few months prior. After an affirmative answer, standard ethics committee requirements were followed including a reminder that participation in the interview was voluntary; that they were free to withdraw at any time without penalty; and that the interview was being audio-taped for future analysis.

In order to ensure that the interviewees accurately remembered the survey, they were reminded that there were two parts to survey with a subtle yet

important difference: the first part of the survey asked teachers to reflect on an ideal field trip experience while the second asked teachers to consider the factors that influence them to book a field trip experience.

The interviews were designed to clarify the responses and findings from the qualitative and quantitative data from the survey using the questions identified below.

The interview was divided into two parts:

A. Interview: Characteristics of an Ideal field trip

For this part of the interview the participants were asked the following questions:

1. What is the first thought that comes into your mind when considering an ideal field trip?
2. When you consider an ideal field trip, can you describe to me what the learning environment looks like? What are students/teachers doing, describe facility, etc
3. After reviewing the preliminary findings of the interviewee's responses to the survey with them, the interviewees were then asked to expand/comment on these findings. Specifically the areas that the interviewees considered to be least and most important from the quantitative data were reviewed with the respondents.

B. Interview: Logistical factors Influencing Field Trip Participation

Interview participants were then asked to reflect on their thoughts with respect to booking an actual field trip for their students by asking the following question: When planning/booking a field trip experience, what is the first thing that comes to mind?

After each of the questions the respondents were given an opportunity to respond. In order to check for understanding and/or clarification, the interviewer paraphrased one or more points after the interviewee's response. If the interviewee failed to respond to the paraphrased comments, a more direct clarification of their response was used. For example, in one interview the respondent replied to the question what is the first thing that comes to mind when considering an ideal field trip with a response that identified affordability, the school they are at, that it provided an educational advantage and finally the time frame. The interviewer verified her understanding with respect to the educational advantage by asking the respondent to comment further on this. In order to clarify the time frame point the interviewer specifically asked, "what do you mean by time frame?". Both of these methods ensured that the interviewees' responses would be meaningful when reviewed at a later date.

In addition, the responses from the interviewee were intermixed with evidence of listening and understanding using comments such us; great, I understand, okay, yes. This provided the necessary feedback to the interviewee to illicit additional and more complete comments.

The interviews were also conducted in a manner that allowed the respondents to address other topics/issues that came to mind during the

conversation. All respondents were given latitude to initially answer the question with whatever came to mind. This was followed, if needed, with an additional reference to the initial question to ensure the objectives of the interview were being fulfilled. All of the interviewees were given the opportunity to give additional feedback through the use of the question "Is there anything else you would like to share/comment on?". Finally, to ensure that the interview did not conclude with the interviewee having outstanding comments the interview was concluded by asking the interviewees if they had any further questions.

Interviews were transcribed and reviewed looking for comments that support or refute the findings from the information collected and collated within the quantitative data. Almost all of the comments from the interviews were also found in the written comments from the survey. The comments from the interviews that were not in the written comments were not completely new topics, but rather more specific comments that complimented more general comments that originated in the written section. For example, many teachers in the written section commented that a field trip must be inexpensive, where in the interview the respondent gave an actual amount of what would be considered affordable by their students. Further examples of the comments from the follow-up interview can be found in the appropriate section in the results chapter.

Data Entry
Quantitative Data

In preparation for data analysis the Likert ratings (data ranging from 1-5) for each statement for the quantitative sections of the survey were entered into excel.

Learning Environment Instrument – Characteristics of an Ideal Field Trip

The data for this section was sorted according to the learning environment scale (category) and the Likert ratings for the reverse polarity questions were adjusted. This adjustment involved converting the responses of a 1 to a 5, a 2 to a 4, the threes remaining a three. The mean for each of the seven scales (Environment Interaction, Integration, Students' Cohesiveness, Teacher Supportiveness, Open-endedness, Preparation and Organisation; and Material Environment) was calculated by totally the Likert ratings for each statement within the scale and dividing by the number of statements. Then each respondent's mean for each of the scales was totaled and divided by the number or respondents to give an overall mean score for each scale (category). The means of each scale were used to rank these categories from highest to lowest, indicating their relative importance to the survey participants.

To assess the reliability of the different variables used in the survey, a Cronbach Alpha score was calculated for each of the scales of the instrument. The Cronbach score gives an indication as to how closely respondents answer items from the same scale similarly.

Similarly, a Discriminant Validity statistical test was also completed for data from the learning environment instrument – Characteristics of an Ideal Field

Trip. Discriminant Validity is calculated by calculating the mean correlation of a scale with all other scales on the instrument. Its value determines the degree to which the scales of an instrument measure discrete and conceptually different constructs.

Supplementary Survey – Factors Influencing Teachers to Organize a Field Trip

The survey respondents Likert ratings for each of the statements identifying factors influencing field trip participation were used to calculate a mean score for that statement. This involved adding up each respondent's Likert rating for each statement and dividing by the number of participants. This mean was then used to rank these statements in order of importance.

Qualitative Data

The quantitative data in this study comes from three sources: the comment section next to each statement in Section 1 and 2, the open ended section (Section 3) and the phone interviews.

Comments provided next to the statements in the learning environment instrument and the supplementary survey were entered as notes attached to the specific statement cell within the excel spreadsheets. These notes were then analysed and interpreted to determine whether there were trends emerging from the respondent's comments. Specifically the author was looking for questions that had high number of similar comments next to specific statements to provide corroborating evidence to each respondents corresponding Likert ranking. Further, the comments were used to further substantiate (triangulation) data from the quantitative findings.

Each of the written statements provided by the respondents in the Open-ended section of the survey were entered into excel. After entering each of the respondents' statements, a coding system was generated for the comments to Question 1 (What are the characteristics of an ideal field trip?) and Question 2 (What prevents you from taking your class on field trips?). The comments for each question were then reviewed and assigned a code according to the tables below. The coded statements were then tallied and entered into excel to quantify their comments.

The codes and their descriptors for Question 1 and 2 are identified below.

Table 2: Coding for Question 1
What are the Characteristics of an Ideal Field Trip?

Code	Description of comments
CU	Supports classroom studies, supports curriculum.
LN	Enhances learning, Encourages thinking, Engaging, Beyond class experience,
AT	Active, hands on, interactive, Physically active, Outdoors, Variety of activities
RE	Relevant to kids, New experience, Age appropriate
CS	Low cost
OR	Well Organized
FN	Fun, Exciting for Students
ST	Excellent staff, relate to kids, interested, knows topic
CO	Enhances Collaboration among students
NS	Close proximity to school
SA	Safe
PL	Provides pre and post learning activities
PS	Parental Support, Fun for Parents
AC	Accessible
OT	Other
GS	Small group size
FL	Flexible
SO	Promotes solitude, reflection
FT	Free time
FA	Free access for parent helpers

Table 3: Coding for Question 2
What prevents you from taking your class on field trips?

Code	Description of comments
CS	Cost
NS	Location, distance from school, transportation cost
PS	Parent support, parent drivers
TI	Time
ST	Stress involves in planning experience, amount of work
CU	Related to classroom, curriculum
DC	Difficult class, behavioral concerns
SA	Safety concerns
LA	Lack of Information
FN	Fun, interesting for students, age appropriate
TOY	Time of year, conflicts with school schedule
NO	Nothing
TS	School staff support
TY	Type, Variety of Experience
WA	Waste of time
AV	Availability
W	Weather
AC	Accessible for all students
OR	Organisational concerns
FA	Facilities, washrooms, lunchroom
SF	Staff at facility
FL	Lack of flexibility
MC	Additional to what is available in classroom
HA	Hand's on, Interactive

The comments for Question 1 were then placed within the category framework identified in the learning environment research (Interactive Environment, Integration, Students' Cohesiveness, Teacher Supportiveness, Open-endedness, Preparation and Organisation, Material Environment) to provide collaborating support to the quantitative data collected using the learning environment instrument. The table below identifies the 7 learning environment scales (categories) and the different comment codes that are grouped into these categories.

Table 4: Categorizing Teacher's Comments into Learning Environment Theory

Learning Environment Scale	Comments (listed by code)
Interactive Environment	LN, AT, RE, FN
Other	CS, NS, SA, PS, AC, FA
Integration	CU
Preparation and organisation	OR, PL
Teacher Supportiveness	ST
Student's Cohesiveness	CO
Material Environment	GS
Open-endedness	SO, FL, FT

The final method for qualitative data collection resulted from the ten follow-up interviews.

Each of the phone interviews was transcribed and printed. All of the statements provided by the interviewees were reviewed and appropriate comments were used to support findings from the quantitative and qualitative data collected from both the learning environment instrument and the supplemental survey. Examples of these comments can be found in the next chapter.

Chapter 4 – Results and Discussion

This chapter reports on the findings of both qualitative and quantitative research strategies that were used to determine the characteristics of an ideal field trip and the factors that influence teachers to organize field trip experiences for their students. The quantitative data was collected using a survey that involved responding to a Likert rating system to gather information from the respondents. The qualitative data was gathered using a variety of formats including providing areas for the respondents to provide comments next to each statement in the survey, open-ended questions and through follow-up interviews. The use of both quantitative and qualitative data allows for both the collection of a large amount of data from numerous subjects and more detailed data from a smaller number of respondents. The use of a variety of methodologies also allows for triangulation; providing support for conclusions using three different sources of data.

Validation of the Learning Environment instrument

While the sample size of 124 is not very large, it is sufficient to run statistical tests that allow the reliability and validity of the survey to be evaluated. In order to measure the reliability of the scale (ensure that the statements within each category were related to the category itself) and the validity of the scale (determine whether each category measured a distinctly different variable), the

survey results were run through two statistical analysis tests, namely Cronbach Alpha and Discriminant Validity.

The Cronbach Alpha score is calculated as a mean from a correlation matrix that illustrates the relatedness between each of the statements with all of the other statements. Scores less than .4 were omitted from the matrix, allowing a visual display of the statements that correlated highest with other statements. This data is summarized below in Table 5.

Table 5: Factor Loadings for each Scale (n=124)

Scale (Row) Item (Column)	Environmental Interaction	Integration	Student Cohesiveness	Teacher Supportiveness	Openendedness	Preparation and Organization	Material Environment
1	0.69						
3	0.659						
31	0.656						
32	0.66						
34	0.695						
4		0.619					
6		0.496					
25		0.604					
27		0.469					
28		0.482					
14			0.637				
15			0.648				
18			0.627				
24			0.633				
29			0.555				
17				0.628			
20				0.455			
21				0.717			
23				0.615			
35				0.739			
7					0.495		
8					0.524		
12					0.593		
16					0.694		
22					0.659		
5						0.437	
10						0.579	
13						0.678	
19						0.638	
26						0.665	
2							0.611
9							0.536
11							0.546
30							0.584
33							0.555

As expected, statements within a category should show high correlation with each other while statements outside of the category should show low correlation with each other.

The mean of the values in the matrix within each category where calculated and shown as the Cronbach Alpha in the table below. A high Cronbach Alpha score indicates that statements within a category had a high relationship with each other. These results are summarized in Table 4 and demonstrate that the instrument is reasonably reliable for the population of teachers surveyed.

The Discriminant Validity is a measure of how separate and distinct each of the scales (Interactive Environment, Integration etc) are from each other. A good measure of distinctness is indicated by a Discriminant Validity score of between .3 and .4. These results are summarized in Table 6 and suggest that for this administration of the instrument the scales represent distinct though somewhat overlapping constructs.

Table 6: Cronbach Alpha and Discriminant Validity Statistical Analysis

	Cronbach Alpha	Discriminant Validity
Interactive Environment Students are actively involved in learning.	.672	.4126
Integration The outdoor event is integrated with classroom studies/curriculum.	.534	.3246
Students' Cohesiveness Students are given opportunities to help/support each other.	.620	.3768
Teacher Supportiveness The effectiveness of the field teacher in instructing/managing the children	*.631	*.3607
Open-endedness Outdoor activities emphasize an open-ended, divergent and individual approach.	.593	.4236
Preparation and Organisation Teachers and students are prepared for the field trip in terms of expectations and organisation of the event	.599	.3810
Material Environment Students are provided with and use adequate learning materials	.566	.4198

Item D – The results from the Teacher Supportiveness scale should be considered carefully as the statements within the Teacher Supportiveness scales showed high correlation with statements that were not found within this scale. Specifically, while statements 21 (Includes a field teacher that can establish and maintain a good rapport with the students) and 35 (Involves a field teacher that communicates clearly at an age appropriate level) showed extremely high correlation with the other statements in this category, they also showed high correlation with statements from Open-endedness, Preparation and Organisation and Material Environment. In addition, the raw Discriminant Validity scores for Teacher Separation showed high values for each of the Open-endedness, Preparation and Organisation and Material Environment scales indicating that

there is not a distinct difference between these scales. While care must be taken in evaluating these results, the very nature of Open-endedness (activities emphasize an open-ended, divergent and individual approach), Preparation (teachers and students are prepare to the field trip)and Material Environment (students are provided adequate materials) requires Teacher Supportiveness.

Attributes of an Ideal Field Experience

Quantitative Data

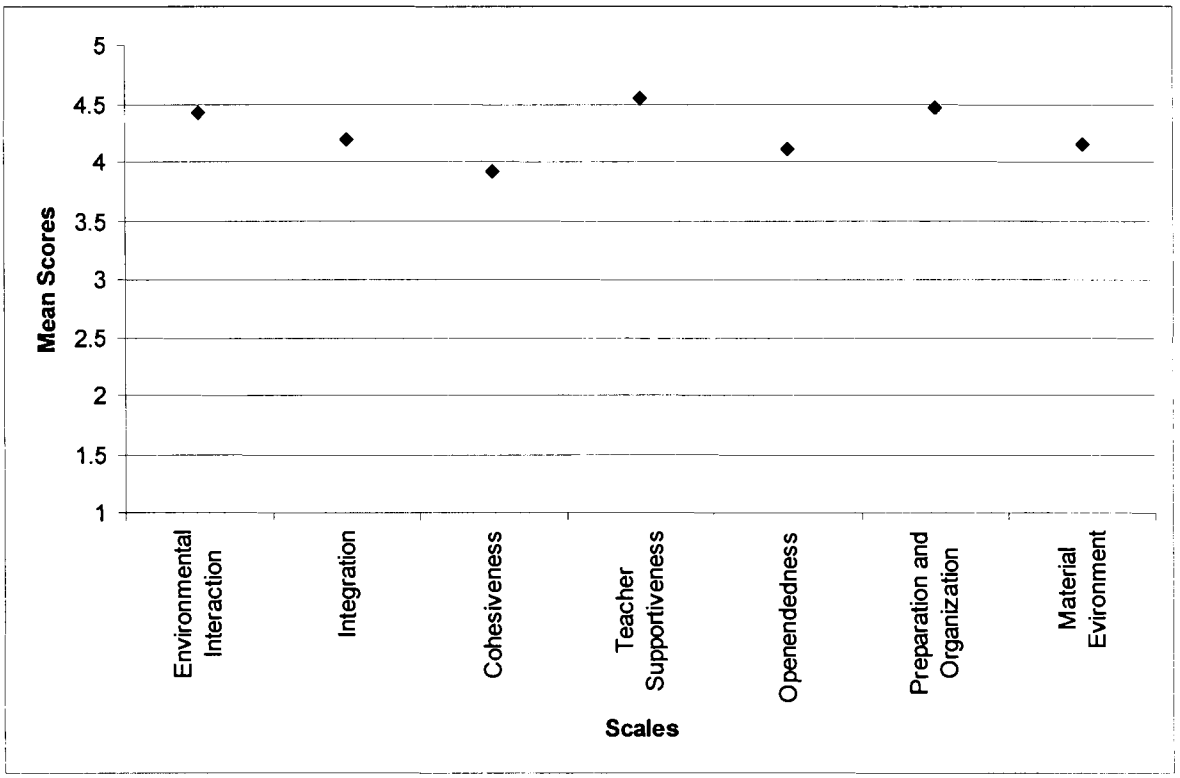
This section of the survey used learning environment methodology to categorize the most important attributes of an ideal field experience from a teachers' perspective. For each of the scales found in learning environment instrument used in this study (Interactive Environment, Integration, Students' Cohesiveness, Teacher Supportiveness, Open-endedness, Preparation and Organisation, Material Environment) the mean of the teacher's responses to the statements was calculated. In order to determine their relative importance, the scales were then ranked. Teacher Supportiveness was ranked as the most important characteristics of an ideal field trip experience by participating teachers with a mean of 4.55 (on a Likert scale of 5). The second most important characteristic (mean 4.46) was found to be the Preparation or Organisation. An Interactive Environment was ranked third with a mean of 4.42. The third and fourth most important characteristic were Integration (mean 4.19) and Material Environment (mean 4.16). The open-endedness of the field trip was ranked as 5^{th} in importance when asked to consider an ideal field experience with a mean

of 4.11. Finally, student cohesiveness was ranked last with a mean of 3.91. A summary of these results is presented in Table 7 and Figure 1, and a discussion of these findings can be found later in this chapter.

Table 7: Mean Scores (Likert responses) on Scales

Scale	Mean Score
Teacher Supportiveness	4.55
Preparation and Organisation	4.46
Interactive Environment	4.42
Integration	4.19
Material Environment	4.16
Open-endedness	4.11
Student's Cohesiveness	3.91

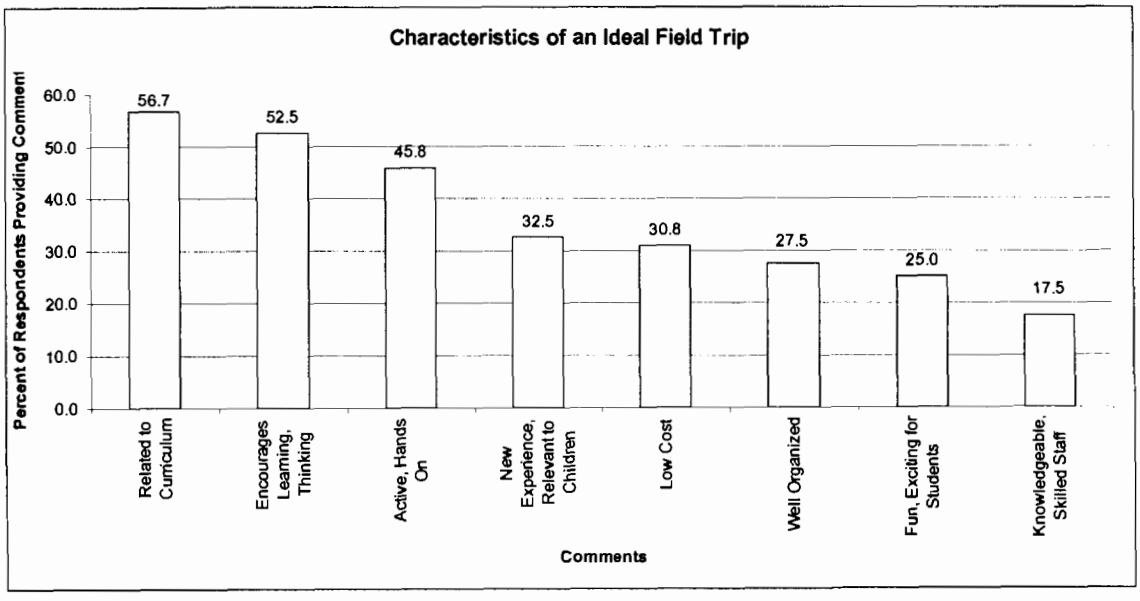
Figure 1: Mean Scores on Learning Environment Scales



Qualitative Data

Qualitative data that supports the learning environment section of the survey (Characteristics of an Ideal Field Trip) came from two sources: the answers to a written response question and follow-up interviews. Teachers were given an opportunity to answer an open-ended question identifying the characteristics of an ideal field trip (Section 3, Question 1). The most common comments from the teachers was the importance of a link to the curriculum (56.7% of teachers), and the opportunity for an engaging, stimulating learning experience (52.5% of teachers). Teachers also identified the importance of an active, hands-on experience (45.8% of teachers) and that the field trip is relevant to the students, including providing a new experience in an age appropriate manner (32.5% of teachers). "Low Cost" was also identified as an important factor with 32.5% of the teachers identifying this as a characteristic of an ideal field trip. A well organized experience (27.5% of teachers); a fun, exciting experience (25.0% of teachers) and knowledgeable, skilled staff (17.5% of teachers) rounded out the most important characteristics of an ideal field trip. These results are summarized in Figure 2 below.

Figure 2: Characteristics of an Ideal Field Trip

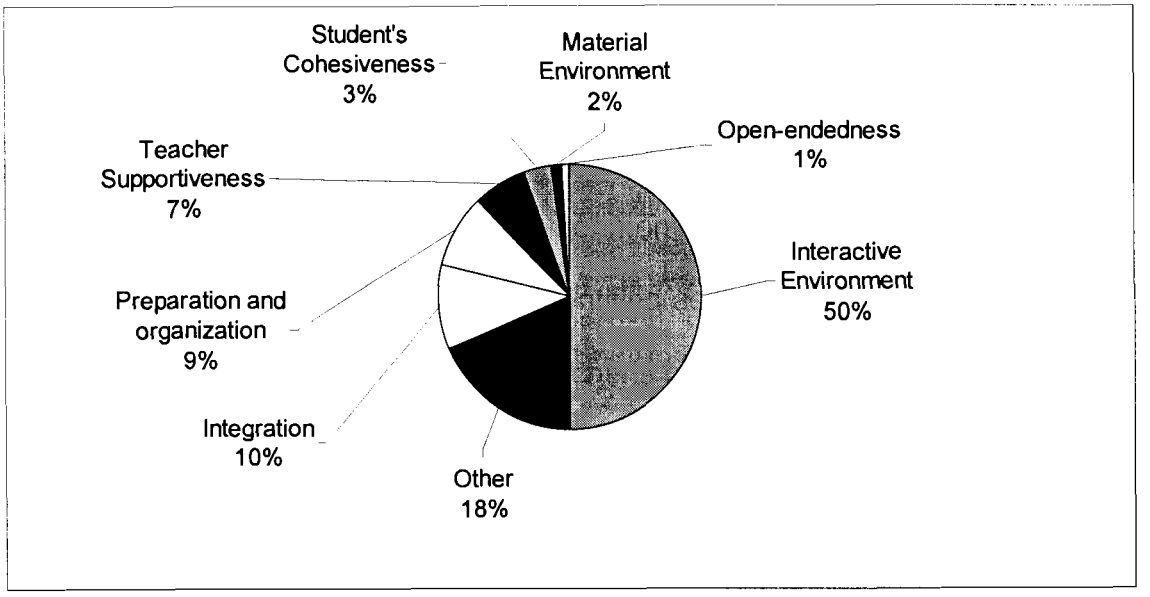


In order to provide a means to integrate the quantitative and qualitative data, the survey respondents written comments to the question "What are the characteristics of an ideal field trip?" were divided into the Learning Environment Scales (Interactive Environment, Integration, Students' Cohesiveness, Teacher Supportiveness, Open-endedness, Preparation and Organisation, Material Environment). An Interactive Environment was the highest category of comments for the qualitative section of the survey with 50% of the comments reflecting this area of the learning environment. The second learning environment category identified as important to teachers in terms of the percentage of comments was the Integration with the curriculum (10%). Preparation and Organisation followed at 9%. Teacher Supportiveness (7%), Student Cohesiveness (3%), Material Environment (2%) and Open-endedness (1%) followed.

It is important to note that while cost was not one of the characteristics of an ideal field trip within the learning environment theory and was not included in the quantitative data collection, it was identified as the third most important factor in the open ended questions (10% of teacher's comments) and is included in the Other category.

Teachers comments categorized into Learning Environment Scales are summarized below in Figure 3.

Figure 3: Teachers' Comments Categorized into Learning Environment Scales



Integration of Quantitative and Qualitative Results

Each of the learning environment categories and the respective results from the quantitative and qualitative results of the survey will be reviewed.

Teacher Supportiveness

This learning environment category refers to the effectiveness of the field teacher in instructing/managing the children. This appears to be extremely

important to teachers as they ranked this as the most important category in the quantitative data collection. The statements within this category included:

- involves a field teacher that can effectively manage a group of students
- involves a field teacher that tries hard to help all the students who need assistance.
- involves a field teacher that is inattentive to the students' questions and comments.
- includes a field teacher that can establish and maintain a good rapport with the students
- involves a field teacher that communicates clearly at an age appropriate level.

Upon examination of these statements it is not hard to imagine why teachers rank this as an important characteristic of the field trip learning environment. The learning experience in itself (i.e. all of the other learning environment characteristics) can be seen as largely dependant on the facilitator that presents, explains or rationalizes the very experience to the students. These ideas are supported by written comments of teachers "a good 'field teacher' connects with students" (Survey #6), "facilitators need to be excellent – interested in their presentation topics, the material and the students" (Survey #19) and "... a facilitator who is interesting, informative and is able to relate to the students". These are supported by the teachers' comments in the follow-up interview. For example, a field trip instructor "that has no real connection with the kids is a real bomb" (Interview #9) and "presenters who are kid oriented and speak to the kids at their level and who really enjoy being with kids is critical" (Interview #7). Finally, a compelling comment was provided during one interview when the respondent replied, "it was an outstanding...it was clear that the main

woman in charge was a teacher....[and] the volunteers knew their stuff but they also knew how to manage children and that makes a big difference" (Interview #4). In summary, an energetic, engaging, interesting and experienced facilitator can make anything interesting enough for one to learn.

Preparation and Organisation

Preparation and Organisation refers to the degree in which teachers and students are prepared for the field trip in terms of expectations and organisation of the event. The statements in this category included:

- includes age appropriate activities that are carefully designed
- provides students with no idea about what to expect prior to their activities
- includes clear instructions from the field teacher
- is not well organized or planned
- provides detailed information about the expected schedule

Teachers commenting on an ideal field trip expect the experience to be well though out and planned. It was evident from the frequency of the comments that the teachers expected the experience to be planned and executed at least to the degree of their personal preparation. In many cases it seemed evident that the teachers assumed that the novelty (as identified by Orion and reviewed in Chapter 2) of a field trip experience should be minimized with a high degree of organisation, preparation and planning. The high ranking of this area in the quantitative section of the survey was supported by written comments from the participants including: the field trip "should be carefully thought out and planned" (Survey #69) and well organized" (Survey # 39, 41, 43, 59, 62). This is supported by comments from teachers in the follow-up interview including "on my

most successful field trips I have had lots of information ahead of time so the kids are very well prepared...about what to expect throughout the whole event." (Interview #4). In fact one teacher further commented on the need for a formalized program by commenting that a field trip should be "focused – not Science World potpourri" (Survey #72), referring to visit to a local science attraction that can be unorganized, unstructured and amount to a "free for all" (author's personal experience) for the students.

Finally a teacher commented that the field trip should be "well organized with pre and post support (Survey #88) referring to the necessity that the organisation and planning by the field trip facility should extend beyond the field trip to include activities and ideas for pre-trip preparation and post-trip review. This was also supported during the follow-up interviews with one respondent commenting that they chose a field trip facility because it "provided a lot of pre-field trip activities" (Interview #6).

It is evident that preparation and organisation are very important to classroom teachers. A well organized field trip both before and during the event ensures that the teachers and students are able to focus on the new experiences rather than logistical and unrelated yet influential factors.

Interactive Environment

This category of learning environment referred to the students being actively involved in learning. The statements that were included in this section of the survey included:

- provides opportunities for students to ask relevant questions

- involves listening to long, lecture type explanations
- provides opportunities for students who are generally silent in the classroom to be more outgoing
- includes opportunities for students to discuss their field trip learning assignment
- includes participating in hands-on field experiences

This category was extremely important to teachers as evident by the fact that fifty percent of the comments provided by the teachers referenced that the field trip activity should include hands' on, engaging activities. Some of the teachers' responses include the field trip should be "active and engaging; students are allowed to be physically engaged (Survey Respondent #3), "students are excited, involved, interested and asking questions" (Survey #21), and should include "hands on activities not available in the classroom (Survey #41). These were supported by responses from teachers in the follow-up interview where one teacher commented that the students should be "actually doing something" (Interview #2). A second interviewee concurred by commenting that the field trip should be "...highly engaging...small groups doing something very hands on" (Interview #4). The idea that the field trip should include a hands on activity that for a variety of reasons can't be completed in the classroom was identified by a number of respondents and can be summarized by "...kids should be actively doing something because the whole idea is for them to be able to experience something they can't in the classroom" (Interview #8).

An interactive learning environment is important in a regular classroom setting as it provides children with the opportunity to learn using a variety of instructional strategies. It is evident that the teachers participating in this study expect that the learning environment during the field trip will include hands-on

activities, and preferably hands-on activities that the teachers cannot, for a variety of reasons (expertise, equipment, time etc), provide in their classroom.

Integration

The learning environment category of integration refers to a field trip event that is integrated with classroom studies/curriculum. The statements within this category include:

- helps the students understand the curriculum covered during regular classes
- emphasizes phenomena which is difficult to investigate in the classroom
- is unrelated to classroom activities
- inhibits transfer of learning from the field experience to the regular class
- provides opportunity for sample collection for study later in the school

The second most common learning environment factor identified by teachers from the written response section were comments related to the integration of the field trip experience with the classroom activities and/or curriculum. This is extremely important to teachers as it justifies their participation in the field trip to themselves, the school administration, the parents and the students. Comments relating to integration of the curriculum between the field trip and the classroom were also mentioned during the follow-up interviews. Examples of comments from the written responses include the field trip "must be curriculum related" (Survey #73), "should be a connection to the classroom curriculum" (Survey #77), must reinforce classroom learning (Survey #20), "should directly relate to IRP and what I am doing with my class" (Survey #46). During a follow-up interview a teacher summarized the importance of integration

by indicating that there is no point in going "if the field trip does not fit into the theme that we are currently studying" (Interview # 7).

The integration of the field trip with the curriculum proved to be an important factor of the field trip learning environment. Without this connection, it seems that there is little reason for most teachers to remove children from the traditional classroom setting. That being said, there was a few comments that indicated that teachers valued a new experience and that they would consider a field trip that was not necessarily directly related to the curriculum but that it would be "a good learning experience that the students may not take upon themselves". (Interview #7). With the range in learning outcomes in each grade level, it is hard to imagine a field trip activity that does not in some way relate to at least one learning outcome.

Material Environment

The term Material Environment refers to participants in an educational setting being provided with and using adequate learning materials. The statements within this area of the survey included:

- includes activities that are designed to enhance student learning
- involves a field teacher using innovative teaching materials for their explanations
- provides inadequate materials and equipment that students need for the field activities
- uses standardized worksheets to facilitate learning
- maximizes individual learning by minimizing group size

This category appeared to be less important to teachers participating in this study. In fact very few comments related to this area of the field trip as a learning environment. One teacher did mention that an ideal field trip includes

opportunities for the children to "touch and do" (Interview #9), inherent in this comment is that there is something (material/equipment) to touch and something to do. Perhaps the low numbers of comments in this category is due to the fact that an interactive and well organized field trip event would require the concepts identified in this area. While teachers did not mention the use of innovative materials and equipment, there were a number of references to small group size (Survey #49 and 97). While perhaps not as important as an interactive learning environment, small group size has definite advantages in terms of personal interaction between an individual student and the group leader.

Open-endedness

This category of the learning environment refers to providing an open-ended, divergent and individual approach. The statements for this category of the survey included:

- encourages self-thinking
- stimulates interest that may encourage individual investigation at school/home
- includes a field teacher lecturing with students taking notes
- provides limited opportunities for individual thinking
- provides opportunity for students to pursue their own particular interest

Again, this category was less important to teachers. Some teachers indicated that they did not necessarily see this as the role of the field trip per se, but a characteristic that is more the responsibility of the classroom teacher to facilitate back in the classroom. Evidence of this line of thinking can be found from Survey #51 whom indicated that a field trip should provide "something that

will capture them and leave them with something to think about later on at home" and "field trips are hard to individualize on site" (Survey #96).

In addition a few teachers mentioned the importance of free time, but did not expand to indicate whether this was for self-reflection or the pursuing of individual interests, as opposed to time for the students to play or expend energy between activities.

Student's Cohesiveness

This category refers to students being given opportunities to help/support each other. This section of the survey included the following statements:

- involves opportunities for students to depend on each other for help
- encourages students to learn from other students' ideas
- provides little chance for students to get to know each other
- allows for little collaboration between students while carrying out the tasks
- facilitates opportunities for students to get to know each other in an alternate setting

This section was identified as one of the least important to the teachers that participated in this research study. Some teachers did identify that an ideal field trip should allow for collaboration between students and inclusiveness of all students (Survey respondent # 9, 11, 27, 44, 70). Other teachers indicated that they envisioned a field trip to be a "bonding experience" (Survey respondent 61, 87). A few teachers indicated in the comment section next to the quantitative statements in this section that they thought that this category was important if student cohesiveness was the intended purpose of the field trip (Survey # 22, 35, 61, 67, 70, 73, 77). It seems that most teachers do not participate in fieldtrips with a primary goal of building group cohesiveness, and in fact one teacher

commented in the follow-up interviews that she envisioned that this cohesiveness could be encouraged and facilitated more effectively in the classroom. Thus while teachers do expect their students to work together during field trip exercises, they do not focus on this as a primary goal of the field trip learning environment.

Cost

Interestingly, a large percentage (18%) of the comments written in response to the question: What are the characteristics of an ideal field trip? do not fall into the categories identified in learning environment theory. Of the 18% of comments that did not fall within learning environment categories, more than half (55%), or 10% of the total comments from teachers for this open-ended question reflected the teacher's concerns with respect to the cost of the field trip experience. Some of the survey responses included "cost is important (Survey #10), "must not be too expensive, or must provide a subsidy for low income schools (Survey #15) and must be cheap (Survey #24). During the follow-up phone interviews comments relating to cost were also given when interviewees were asked to comment on the characteristics of an ideal field trip. Examples of these comments included: "Cost is a big one because we are in an inner city school" (Interview #7) and "affordability is the first thing that comes to mind" (Interview #9).

Logistical factor involved in planning a field trip

Quantitative Data

Teachers were asked to rate factors that influence them to book field trip experiences based on their degree of importance compared to each other. The choices were comprised of the seven learning environment categories (Interactive Environment, Integration, Students' Cohesiveness, teacher Supportiveness, Open-endness, Preparation and Organisation and Material Environment) and ten logistical factors including parental support, administrative support, program cost, transportation time, complimentary parking, time, supporting materials, adult supervisors, transportation cost, and other teacher support. Teachers were asked to rate each category on a 5 point Likert scale ranging from 'very important' to 'very unimportant'. The mean of the survey respondents' choices was calculated for each category. The top four factors that prevent teachers from participating in field trips include Integration, Preparation and Organisation, Material Environment and Program Cost. Interestingly three out of the four represent aspects within the learning environment (Integration, Preparation and Organisation, Material Environment). The fourth factor that inhibits teachers' participation in field trips was program cost. The results are summarized in Table 6.

Table 8: Ranking of Factors Influencing Teacher's to Participate in Field Trip Experiences

1. Integration
2. Preparation and Organisation
3. Material Environment
4. Program Cost
5. Interactive Environment
6. Teacher Supportiveness
7. Transportation Cost
8. Administrative Support
9. Transportation Time
10. Parental Support
11. Adult Supervisors
12. Student's Cohesiveness
13. Open-endedness
14. Supporting Materials
15. Free Parking
16. Other Teacher Support
17. Time (whole day)

Qualitative Data

Question 2 (What prevents you from taking your class on field trips?) in the open-ended section of the survey provided an opportunity to collect qualitative data to complement the quantitative data collected from the supplemental survey (Logistical Factors Influencing Field Trip Participation). The variety of the teacher's comments provided an insight into the inhibiting factors influencing field trip participation beyond the statements identified in the survey. Most of the comments given by teachers in this section related to the logistical factors involved in planning and participating in a field experience. Specifically, the most common factor identified by teachers is the expense of a field trip with 80.8% of teachers that participated in the survey identified this as a concern. Some examples of these comments include:

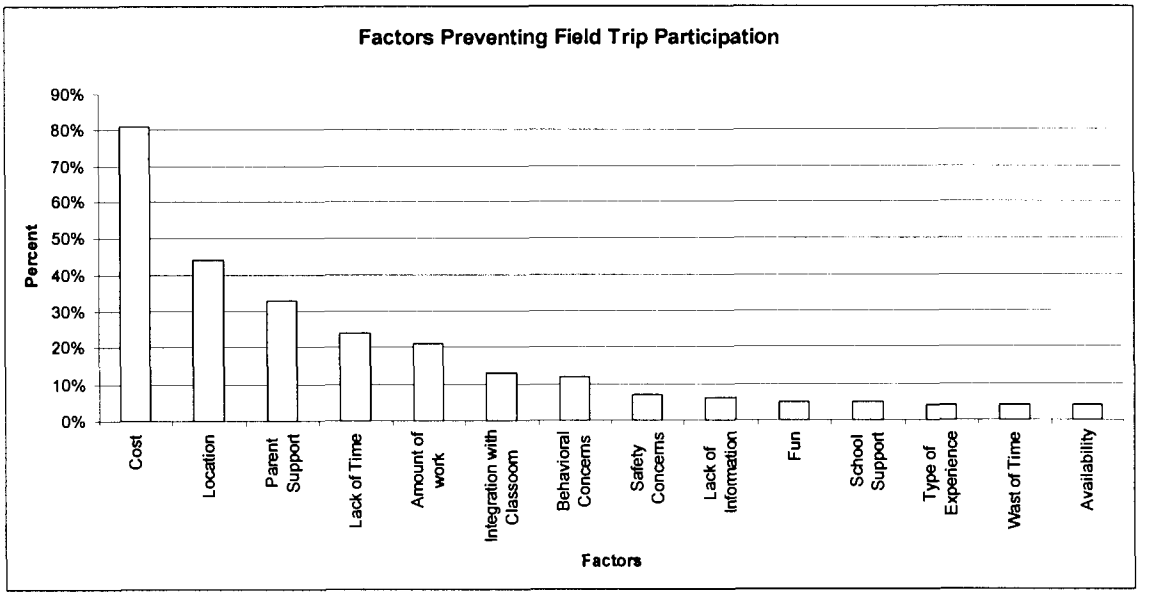
- The cost. I work at an inner city school where parents have difficulty providing meals, let alone money for trips (Survey #10)
- Cost – we are limited to two or three (fieldtrips) because bus costs plus venue cost adds up fast (Survey #28)
- Lack of funds (Survey #69)
- The field trip must be cost effective (Survey #70)
- Money, we can't go on fieldtrips that are costly (Survey #80)
- Cost !$!$!$ (Survey #104)

These comments were supported by teachers' comments in the follow-up interviews. Nine of the ten teachers identified cost as a limiting factor although for some it was not the first limiting factor mentioned. Most of these teachers (70%) said field trips over ten dollars were too expensive; of these two indicated that they would not ask parents for a total of more than five dollars for one field trip.

Ranked as much less important, but related in terms of traveling expenses, was the location of the facility or the distance from the school (44.2% of teachers) and the parental support/parent drivers' availability (32.5% of teachers). The next category of factors that prevent teachers from participating in field trips was the time required to organize the event (24.2% of teachers) and the stress and amount of extra work involved (20.8% of teachers). The class composition, or the risks involved in taking difficult students to the field trip site was also identified as a limiting factor (13.3% of teachers), as was concerns for safety (11.7% of teachers). Five percent of teachers identified lack of information, fun for the students and school support as factors that prevent them from taking children on field trip activities. Finally, four percent of teachers identified concerns with the type of experience, the fact that field trips are a

waste of time, and the availability of activities. A summary of this data can be found in 4.

Figure 4: Factors Preventing Field Trip Participation – Teachers Comments



Chapter 5 – Discussion/Conclusion

Characteristics of an Ideal Field Trip

The quantitative data from the learning environment instrument together with the qualitative data (open-ended questions and the follow-up interviews) provided an interesting insight into the characteristics of an ideal field trip from a teachers' perspective. This study attempted to examine these characteristics using learning environment research methodology and to subsequently determine which of the seven learning environment categories (Teacher Supportiveness, Preparation and Organisation, Interactive Environment, Integration, Material Environment, Open-endedness, Student's Cohesiveness) were most important. It was evident from the teachers' responses that teachers do consider aspects of learning environment theory when considering an ideal field trip. The results from both methodologies (qualitative and quantitative) indicated that Teacher Supportiveness, Preparation and Organisation, Interactive Environment and Integration are all important characteristics of an ideal field trip to practising classroom teachers.

Participating teachers indicated that the Teacher Supportiveness or the effectiveness of the field teacher in instructing/managing the children is important to them. The teachers indicated that the facility instructors have to be knowledgeable (more than the classroom teacher) in the field trip area. In

addition the teachers also felt that the instructor needed to be able to manage a group of children while at the same time delivering the program in an interesting, fun and enjoyable manner. In terms of facility planning and development, facilities should ensure that their staff is experienced in working with a variety of groups (size, behaviour, age) of children. Staff should also be informed of current educational literature including techniques for classroom management, and be given either onsite in-service in these areas or be given the opportunity to pursue training in this area.

Preparation and Organisation were also identified as important by the participating teachers. This category refers to the degree to which teachers and students are prepared for the field trip in terms of expectations and organisation of the event. Advanced preparation and organisation will not only decrease the stress due to the informal and probably less structured learning environment of the field trip; it also influences the degree of learning that occurs during this experience. The concept of improving learning during field trips by advanced preparation and organisation is supported by the research done by Orion and Hofstein (1994) that indicates that novelty factors should be minimized in order to maximize student learning. From the teacher's perspective, organizing facilities should prepare detailed pre and post field trip packages that include logistical information about the field trip site, specific field trip program information and sequential, supportive lesson plans for the teacher. This will ensure that the teachers and subsequently the students will be ready to maximize the learning experience both during and after the field trip.

The teachers overwhelmingly indicated that a hands-on (Interactive) program and a program that is integrated with the curriculum were also important. Teachers expect field trip facilities to be cognisant of and implement current education pedagogy that encompasses a range of learning styles (auditory, visual, and kinaesthetic). Teachers also expect an emphasis on kinaesthetic activities with materials and activities that that cannot, for a number of potential reasons, be replicated in the classroom. Facilities should ensure that planned activities are unique in at least one of (but preferably more) of the following: physical space, material requirements, or staff experience. Facilities should also ensure that their programs meet learning outcomes of at least one area (preferably more) of the current provincial curriculum in order for teachers to justify the field trip to themselves, their students' parents and their school administration. In addition, field trip facilities must continue to modify and update their programs not only to incorporate new learning theories, but also in response to changes to the provincial curriculum.

One feature of an ideal field trip that is not related to the Learning Environment but was mentioned by a large number of the respondents is the affordability of the program. With the huge variation of socio-economic areas between and within schools, cost is an ongoing concern for classroom teachers. An ideal field trip that involves facilitators at a low student-to-facilitator ratio coupled with a unique hands-on experience that is well organized and integrated into the curriculum, also requires experienced delivery and support staff. These field trips are therefore usually more expensive than ones without these ideal

characteristics. A potential result is that these "ideal" field trips are overlooked due to the cost required per participating student and replaced with a perhaps "less ideal" field trip, but one that meets the maximum financial limit of the participants. A related factor is the teacher's perception of what is too much money to ask for from the parents/guardians. When asked the upper limit of money for a field trip the teacher's responses in the interviews ranged from $3.00 to $10.00; simple budgeting quickly illustrates the difficulty in delivery quality educational programs within these financial limitations. This is an ongoing concern that relies on one of two solutions: fund-raising within schools motivated by teachers and/or parents or the use of private sponsorship in direct partnership with the field trip facility. The potential for both of these fundraising tactics could probably be enhanced with increased donor knowledge of the educational benefits of field trip experiences.

In conclusion, teachers do consider learning environment characteristics when imagining an ideal field trip experiences for their students and field trip facilities should incorporate these characteristics when planning and implementing field trip activities.

Factors Influencing Field Trip Participation

Teachers were asked to consider the factors that influence their choice to plan and participate in a field trip experience to determine if these teachers consider aspects of the learning environment or if more logistical factors influence their decision-making. When asked to consider a list of factors teachers chose Integration, Preparation and Organisation, Interactive

Environment and Teacher Supportiveness as the most important when planning to participate in a field trip. Interestingly, the four learning environment characteristics identified as important when planning a field trip experience were the same the four characteristics (slightly different order) identified when teachers were asked to consider an ideal field trip. This is encouraging as it indicates that when it comes to a teacher choosing to participate in a field trip or to remain in the classroom the logistical factors inhibiting the experience have not overtaken the educational characteristics of the experience.

However, once again, the cost factor was identified as an extremely important limiting factor when planning a field trip experience. It is obvious that the cost of the program, almost regardless of the quality of the educational experience, is the primary factor on teacher's minds when considering an external learning experience for their students. To meet the needs of the teachers in terms of interactiveness, curriculum integration and teacher supportiveness it is extremely important for field trip facilities to employ a trained educator(s). However, a challenge on behalf of these organisations is to create these experiences for teachers (and thus their students) while ensuring the field trip facility remains affordable for the large percentage of the local student population.

Limitations

The results from this survey indicate that teachers do consider the learning environment when considering an ideal field trip and both learning environment and logistical factors influence teachers when booking field trip

experiences. However, these conclusions must be considered within the limitations of this study and may not be generalisable to other populations or locations. Sample size is often a limitation in research studies, and is also a concern with this study comprised of 124 respondents. In addition, most of the surveys were completed by teachers from two districts within the greater Vancouver area (Vancouver and Surrey). To improve the results of this study, a larger sample size involving teachers from all school districts would enhance the findings. In addition, teachers voluntarily agreed to participate in this study. While voluntary participation is a mandatory requirement for human research projects, the mere willingness to participate in the study may form a subset of teachers more likely to participate in field trip activities, and exclude teachers that do not participate in field trips, thus these teachers thoughts, reasons and rationale are potentially absent from this study. In addition, the teachers were asked to comment on an ideal field trip not an actual one. It is quite likely that the results may be different if teachers were asked to comment on an actual field trip. It is also likely that their responses from one actual field trip experience would be quite different from their responses to a different field trip experience.

A second limitation of this project, and perhaps all studies related to the practice of teaching is the difficulty in teachers separating their notion of an ideal practice with the realities found within their classroom. For example, a teacher may consider a field trip that encompasses the whole school day as a critical element to deciding whether to participate or not, but would not necessarily

identify this as a limiting characteristic as they are aware of the lack of pedagogically soundness to this feature.

A third limitation for this project arose out of the design for the quantitative data collection found in the Supplementary Survey - Factors That Influence Teachers to Organize a Field Trip. Teachers were asked to use a Likert ranking to rate the importance of a variety of factors that influence their choice to participate in a field experience after which the mean of the teachers' responses were calculated to allow for a ranking to be inferred from the teachers' selections. A more appropriate means of gathering this information perhaps would have been to ask the teachers to rank the statements from one to seventeen. This would have allowed the reporting of an actual ranking of the factors influencing field trip participation rather than one inferred by the participants' responses. It should be noted for further researchers that this suggestion may have inherent problems in that the large number of statements (17) may be a somewhat frustrating exercise for participants to complete.

Further research

While this study provides field trip facilities with an idea of how important the learning environment and logistical factors are to classroom teachers, there is some additional research that would help continue this area of educational research.

- A larger sample size would allow for more representative conclusions to be drawn from the data collected. This sample size should not only include a larger number of teachers, but also include teachers that represent all of the local school districts.

- Field trip facilities may like to use the survey in this study as a template to design a survey tool that is specific to their facility which would enable more specific conclusions to be drawn for their facility.

- Facilities could fund researchers to develop an actual and a preferred surveys for students to complete prior to and after a field trip experience to provide quantitative data to be used in evaluating or administering such programs.

Conclusion

It is hoped that this study is useful to both teachers and field trip facilities in terms of participating in and planning field trip experiences. This study will hopefully introduce and/or provide insight to the ideas found within learning environment research to teachers and encourage them to think about this area of research both within their classroom instruction and as it relates to field trip experiences. It is also hoped that teachers will use this study to review their choices as they pertain to field trip exercises to determine if, and to what degree, the field trip meets the criteria of an ideal field trip in terms of learning environment theory.

It is also hoped that field trip facilities can use the information gathered in this study to reflect on their practises in terms of provided field trip activities that maximize the learning with respect to the parameters of different learning environments identified in this study. In addition, this research should encourage field trip facilities to consider both the learning environments and logistical factors, especially cost, when planning new field trip opportunities for children.

References

Anderson, David (1994). *The effect of pre-orientating year eight students to the informal learning environment of a science museum on cognitive learning.* Unpublished Master of Education thesis, Queensland University of Technology, Brisbane, Australia.

Anderson, D. & Lucas, K.B. (1997). The effectiveness of orienting students to the physical features of a science museum prior to visitation. *Research in Science Education, 27*(4), 485-495.

Anderson, David & Zuochan Zhang (2003). *Factors Influencing K-7 Teaches Decisions to Make Field Trips to Science World BC.* (Report), Vancouver, BC: University of British Columbia, Curriculum Studies.

Belk, Jo Anne; Brian Knippers and Suzette Burton. Integrating Field Experiences in Science Courses. Retrieved October 2, 2002. from Mississippi State University website: www.msstate.edu/org/mas/apriljournal/integrating.html.

Dierking, Lynn D. and John H Falk. (1994). Family Behavior and Learning in Informal Science Settings: A Review of the Research. *Science Education.* 78(1), 57-72.

Falk, John H. and Lynn D. Dierking (1997). School Field Trips: Assessing Their Long-Term Impact. *Curator,* 40(3), 211-218.

Falk, John H, Thane Moussouri, and Douglas Coulson. (1998). The Effect of Visitor's Agendas on Museum Learning. *Curator*, 41(2), 106-120.

Fisher, L. Darrell & Waldrip, Bruce G. (2002). Measuring Culturally Sensitive Factors of classroom Learning Environments with the CLEQ. In Swee Chiew Goh and Myint Swe Khine (Eds.) *Studies in Educational Learning Environments, An International Perspective* (pp. 27-48). River Edge, NJ: World Scientific Publishing Co.

Fraser, B.J. (1979). Evaluation of a Science-based Curriculum. In H.J. Walberg (Ed.), *Educational Environments and Effects: Evaluation Policy and Productivity* (pp. 218-234). Berkeley, CA: McCutchan Publishing Corporation.

Fraser, B.J. (1993). Two Decades of classroom Environment Research. In B.J. Fraser and H.J. Walberg (Eds.), *Educational Environments: Evaluation, Antecedents and Consequences Evaluation of a science-based curriculum* (pp. 3-27). Oxford: Pergamon Press.

Fraser, Barry J. (1998a). Science Learning Environments: Assessment, Effects and Determinants. In Barry J. Fraser and Kenneth G. Tobin (Eds.), *International Handbook of Science Education* (pp. 527-564). Boston: Kluwer Academic.

Fraser, Barry J. (1998b). Classroom Environment Instruments: Development, Validity and Applications. *Learning Environments Research. An International Journal*, 1(1), 7-33. Netherlands: Kluwer Academic Publishers.

Fraser, Barry J. (1999). 'Grain sizes' in learning environment research: Combining qualitative and quantitative methods. In H. Wasman & H. J. Walberd (Eds.), *New directions for teaching practice and research* (pp. 285-296). Berkeley, CA: McCutchan.

Fraser, Barry J. (2002). Learning Environments Research: Yesterday, Today and Tomorrow. In *Studies in Educational Learning Environments* (pp. 1-25). Singapore: World Scientific Publishing Co.

Fraser, B.J. & Fisher, D.L (1996). Using short forms of classroom climate instruments to assess and improve classroom psychosocial environment. *Journal of Research in Science Teaching*, 5, 387-413.

Fraser, B. J. & The, G.P.L. (1994). Effect sizes associated with micro-PROLOG-based computer-assisted learning. *Computers in Education*, 23, 187-196.

Griffin, Janette and David Symington. (1997) Moving from Task-Orientated To Learning-Orientated Strategies on School Excursions to Museums. Science-Education, 81(6), 763-779.

Heat, D.N. (1985). Teaching for adult effectiveness. In J. Kraft and M. Sakofs (Eds.), *Theory of Experiential Education* (pp. 108-113). Boulder, CO: Association for Experiential Education.

Kisiel, James. (2004). Understanding Elementary Teachers Motivations for Science Fieldtrips. Retrieved August 17, 2005 from Wiley Interscience Website: http://www3.interscience.wiley.com/cgi-bin/accessdenied?ID=110552512&Act=2138&Code=4717&Page=/cgi-bin/fulltext/110552512/PDFSTART

Knapp, Doug & Raymond Poff. (2001). A Qualitative Analysis of the Immediate and Short-term Impact of an Environmental Interpretive Program. *Environmental Education Research*, 7 (1), 55-65.

Lewin, K. (1936). *Principles of Topological Psychology*. New York: McGraw.

Mackenzie, A. & R. White. (1982). Fieldwork in geography and long-term memory structure. *America Educational Research Journal*, 19, 623-632.

Michie, M. (1998). Factors influencing secondary science teachers to organize and conduct field trips. *Australian Science Teacher's Journal*, 44(4), 43-50.

Millan, Deborah A. (1995). Field Trips: Maximizing the Experience. In *Experience in the Curriculum*. (pp. 123-143). Ontario, Canada: Rural Education and Small Schools.

Munroe, M., J. Washburn, T. Goodale, and B. Wright. (1997). *National park education programs making a difference: Evaluating PARTNERS, A Parks as Classrooms Program*. Harpers Ferry, WV: National Park Service.

Murray, H.A. (1938). *Explorations in personality*. New York: Oxford University Press.

Naizer, Gilbert L. (1993). Science and Engineering Professors: Why did they Choose Science as a Career? *School Science and Mathematics*, 93(6), pp. 321-325.

Nespor, Jan. (2000). School Field Trips and the Curriculum of Public Spaces. *Curriculum Studies*, 32(1), pp. 25-43.

Novak, J.D. (1976). Understanding the learning process and effectiveness of teaching methods in the classroom, laboratory and field. *Science Education*, 60, 493-512.

Orion, N. (1993). A model for the development and implementation of field trips as an integral part of the science curriculum. *School Science and Mathematics*, 93, 325-331.

Orion, Nir and Avi Hofstein. (1994) Factors that influence Learning during a Scientific Field Trip in a Natural Environment. *Journal of Research in Science Teaching*. 31(10), pp. 1097-1119.

Orion, Nir, Avi Hofstein, Pinchas Tamir and Geoffrey J. Giddings. (1997). Development and Validation of an Instrument for Assessing the Learning Environment of Outdoor Science Activities. *Science Education*, 81, 161-171.

Seon Uk Lee, & Kim, Heui Baik. (2002). Curriculum Development and Learning Environment Research in Korea. In Swee Chiew Goh and Myint Swe Khine (Ed.) *Studies in Educational Learning Environments, An International Perpective.* (pp. 169-196). River Edge, NJ. World Scientific Publishing Co.

Spencer, Herbert. (1861). *Education: Intellectual Moral and Physical*. London: Williams and Norgate. Reprinted in 1932.

Stern, G.G., Stein, J.J. and Blookm B.S. (1956). *Methods in personality assessment*. Glencoe, IL: Free Press.

Westbrook, Vanessa. (2001). My Changing View of Field Trips. In Phyllis Katz (Ed.), *Community Connections for Science Education Volume II. History and Theory you Can Use*, (pp 41-43). Washington: National Science Teachers Association.

Wubbels, T. & M. Brekelmans. (1998). The teacher factor in the social climate of the classroom. In B.J. Fraser and K.G. Tobin (Eds.), *International Handbook of Science Education, Part One* (pp.565-580). Dordrecht, Netherlands: Kluwer Academic Publishers.

Yang, Jong-Hsiang, Iris Tai-Chu Huang and Jill M. Aldridge. (2002). Investigating Factors that Prevent Science Teachers from Creating Positive Learning Environments in Taiwan. In Swee Chiew Goh and Myint Swe Khine (Eds.), *Studies in Educational Learning Environments, An International Perspective* (pp. 217-234). River Edge, NJ: World Scientific Publishing Co.

Zandvliet, David B. (2002). Learning Environments in Technology-Rich Classrooms. In Swee Chiew Goh and Myint Swe Khine (Eds.), *Studies in Educational Learning Environments, An International Perspective* (pp. 49-72). River Edge, NJ: World Scientific Publishing Co.

Appendix A – Attributes of Field Trips

Attributes of Field Trips

Please do not write your name on this survey.

Section 1
Objectives: To determine the factors that teachers consider to be important attributes of a meaningful fieldtrip experience.
Instructions: Read each question carefully and circle the appropriate rating. Please feel free to provide comments in the area provided.

	Rating					Comments
An ideal field trip:	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5	
1. Provides opportunities for students to ask relevant questions (A)	1	2	3	4	5	
2. Maximizes individual learning by minimizing group size (G)	1	2	3	4	5	
3. Involves listening to long, lecture type explanations (A)	1	2	3	4	5	
4. Helps the students understand the curriculum covered during regular classes (B)	1	2	3	4	5	
5. Provides detailed information about the expected schedule (F)	1	2	3	4	5	
6. Emphasizes phenomena which is difficult to investigate in the classroom (B)	1	2	3	4	5	
7. Includes a field teacher lecturing with students taking notes (E)	1	2	3	4	5	
8. Provides opportunity for students to pursue their own particular interest (E)	1	2	3	4	5	
9. Uses standardized worksheets to facilitate learning (G)	1	2	3	4	5	
10. Is not well organized or planned (F)	1	2	3	4	5	
11. Provides inadequate materials and equipment that students need for the field activities (G)	1	2	3	4	5	
12. Stimulates interest that may encourage individual investigation at school/home (E)	1	2	3	4	5	
13. Includes clear instructions from the field teacher (F)	1	2	3	4	5	
14. Allows for little collaboration between students while carrying out the tasks (C)	1	2	3	4	5	
15. Facilitates opportunities for students to get to know each other in an alternate setting (C)	1	2	3	4	5	
16. Provides limited opportunities for individual thinking (E)	1	2	3	4	5	
17. Involves a field teacher that can effectively manage a group of students. (D)	1	2	3	4	5	

Please circle the appropriate rating. Please feel free to provide comments in the area provided.

Please do not write your name on this survey.

	Rating					Comments
An ideal field trip:	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5	
18. Provides little chance for students to get to know each other (C)	1	2	3	4	5	
19. Provides students with no idea about what to expect prior to their activities (F)	1	2	3	4	5	
20. Involves a field teacher that is inattentive to the students' questions and comments. (D)	1	2	3	4	5	
21. Includes a field teacher that can establish and maintain a good rapport with the students. (D)	1	2	3	4	5	
22. Encourages self-thinking (E)	1	2	3	4	5	
23. Involves a field teacher that tries hard to help all the students who need assistance. (D)	1	2	3	4	5	
24. Encourages students to learn from other students' ideas (C)	1	2	3	4	5	
25. Is unrelated to classroom activities (B)	1	2	3	4	5	
26. Includes age appropriate activities that are carefully designed (F)	1	2	3	4	5	
27. Inhibits transfer of learning from the field experience to the regular class (B)	1	2	3	4	5	
28. Provides opportunity for sample collection for study later in the school (B)	1	2	3	4	5	
29. Involves opportunities for students to depend on each other for help (C)	1	2	3	4	5	
30. Involves a field teacher using innovative teaching materials for their explanations (G)	1	2	3	4	5	
31. Provides opportunities for students who are generally silent in the classroom to be more outgoing (A)	1	2	3	4	5	
32. Includes opportunities for students to discuss their field trip learning assignments (A)	1	2	3	4	5	
33. Includes activities that are designed to enhance student learning (G)	1	2	3	4	5	
34. Includes participating in hands-on field experiences (A)	1	2	3	4	5	
35. Involves a field teacher that communicates clearly at an age appropriate level. (D)	1	2	3	4	5	

Please continue on the next page.

Completed surveys can be mailed to: Lora Hargreaves, #46 – 7488 Mulberry Place, Burnaby, BC. V3N 5B4

Attributes of Field Trips

Please do not write your name on this survey.

Section 2
Objectives: To determine factors that influence teachers to organize a field trip experience.
Instructions: Consider each of the following statements with respect to their importance when planning/booking a field trip experience. Please circle the appropriate rating for each statement.

	Rating					Comments
Factors that influence teachers to organize a field trip:	Very Unimportant	Unimportant	Neutral	Important	Very Important	
1. Interactive Environment Students are actively involved in learning.	1	2	3	4	5	
2. Integration The outdoor event is integrated with classroom studies/curriculum.	1	2	3	4	5	
3. Students' Cohesiveness Students are given opportunities to help/support each other.	1	2	3	4	5	
4. Teacher Supportiveness The effectiveness of the field teacher in instructing/managing the children	1	2	3	4	5	
5. Open-endedness Outdoor activities emphasize an open-ended, divergent and individual approach.	1	2	3	4	5	
6. Preparation and Organization Teachers and students are prepared for the field trip in terms of expectations and organization of the event	1	2	3	4	5	
7. Material Environment Students are provided with and use adequate learning materials	1	2	3	4	5	
8. Parental Support Parents support field experiences.	1	2	3	4	5	
9. Administrative Support School administration supports the field experience.	1	2	3	4	5	
10. Program Cost The amount that must be requested from parents and/or fundraised.	1	2	3	4	5	
11. Transportation Time The transportation time from your school to the field trip site.	1	2	3	4	5	
12. Parking The facility provides complimentary parking	1	2	3	4	5	
13. Time The field trip activities involve the entire school day	1	2	3	4	5	
14. Supporting Materials The facility provides pre and post learning activities and/or lesson plans.	1	2	3	4	5	
15. Adult Supervisors The facility does not charge for a reasonable ratio of adult supervisors.	1	2	3	4	5	
16. Transportation Cost The cost required to transport students to the site. Variable depending on the availability of parent drivers or the need for a school bus.	1	2	3	4	5	
17. Other teacher support Colleagues support the field experience.	1	2	3	4	5	

Attributes of Field Trips

Please do not write your name on this survey.

Section 3 Please answer the following questions:

1. What are the characteristics of an ideal field trip?

2. What prevents you from taking your class on field trips?

3. Additional Comments:

Section 4 Demographic Information.

Current Teaching Level (Grade) _____ Current School District _____ Number of Years Teaching _____

Thank you.

Surveys can be mailed to: Lora Hargreaves, #46 – 7488 Mulberry Place, Burnaby, BC. V3N 5B4