ABSTRACT: Museums are favorite and respected resources for learning worldwide. In Israel, there are two relatively large science centers and a number of small natural history museums that are visited by thousands of students. Unlike other countries, studying museum visits in Israel only emerges in the last few years. The study focused on the roles and perceptions of teachers, who visited four natural history museums with their classes. The study followed previous studies that aimed at understanding the role teachers play in class visits to museums (Griffin & Symington, 1997, Science Education, 81, 763–779; Cox-Petersen et al., 2003, Journal of Research in Science Teaching, 40, 200–218; Olsen, Cox-Petersen, & McComas, 2001, Journal of Science Teacher Education, 12, 155–173) and emphasized unique phenomena related to the Israeli system. None of the teachers interviewed for this study was an active facilitator, and in many cases the teachers had no idea regarding the field trip program and rationale. Our main findings support previous studies that indicated that teachers are hardly involved in planning and enacting the museum visit. An issue of concern, which came up in this study, is the tendency of Israeli schools to use subcontractor companies that plan and make all the museum arrangements. Unlike the common patterns described in the paper, a case study of unique teacher’s function is presented as well.

Correspondence to: Revital Tal; e-mail: rtal@tx.technion.ac.il
INTRODUCTION

Museums and science centers are favorite and respected resources for learning worldwide. In Israel, there are two relatively large science centers and a number of small natural history museums (NHM) that are visited by thousands of students every year. Unlike in other countries, studying museum visits in Israel, of either families, or school groups only emerged in the last few years. This study, which is part of a larger study (Tal, 2004a), held in four natural history museums and centers in Israel, focused on the roles and perceptions of teachers, who visited the museums with their classes. The study followed previous studies that aimed at understanding the role teachers play in class visits to museums (Cox-Petersen et al., 2003; Griffin & Symington, 1997; Olson, Cox-Petersen & McComas, 2001). While these studies were carried out in countries with many years of museum education, our study is the first one of its kind in Israel. These previous studies focused on one or two institutions, while we described perceptions and roles of teachers’ who visited four museums. These museums provide various programs and employ various types of educational staff. Due to the fact that many variables interrelate in the enactment of a class visit to a museum, our study focuses on the teachers’ function before, during, and after these visits. Unlike most of the studies of class visits to museums, in Israel, nearly 100% of all museum visits nowadays are facilitated by museum guides. Quite often the teachers are not even involved in arranging the field trip. Our study implies that this might be the reason for the secondary role the school teacher plays in the museum visit. Our findings, which add to the research that is carried out mainly in the United States and Australia on this aspect, suggest that the way teachers are involved in planning, enacting, and concluding the museum visit is an international issue.

THEORETICAL BACKGROUND

Organized museum visits by classes, particularly from primary schools increased steadily in many countries. Museums that emphasize science and technology have been especially busy; perhaps because of the central place allocated to science and technology in the curriculum in many countries (Falk & Dierking, 2000; Gilbert & Priest, 1997; Griffin, 2004). Many museum programs are developed to reinforce, support, and complete the science curriculum (Rennie & McClafferty, 1995, 1996). Teachers believe that museum visits stimulate interest and motivation in science and develop scientific and social skills (Michie, 1998). Other reasons for visiting museums include teachers’ desire to change the pace, providing social experiences, general enrichment, and fun (Kubota & Olstad, 1991; Gottfried, 1980; Hicks, 1986). In Israel, school groups are the major visitor audience in science centers and natural history museums. The Israeli Ministry of Education acknowledges and supports museum-learning experiences by funding a large number of centers according to their number of student visits and educational programs (Carmeli & Shavit, 2001). Although schools and teachers attribute high value to the museum visit, the international literature indicates that teachers hardly define their goals for the museum visit, they rarely plan or enact pre-visit activities, and they hardly ever perceive the museum activity as engaging sociocultural learning experience (Cox Petersen et al., 2003; Griffin, 2004; Griffin & Symington, 1997; Kisiel, 2003; Price & Hein, 1991).

Very little preparation is done for museum excursions, and even then, most of the preparation is technical and focuses on schedules and instructions regarding clothing and food (Griffin & Symington, 1997). Most of the studies that reported about meaningful preparation or follow-up activities described research settings, in which the researchers were involved in preparing the activity with the teachers or the museum staff (Anderson et al., 2000; Gilbert & Priest, 1997; Henriksen & Jorde, 2001). In a recent review of the research on school
visits to museums, Griffin (2004) provides many possible reasons for this pattern. Teachers struggle with time constraints, logistical issues, various student needs and pressure for accountability that limit their ability, and willingness to provide proper preparation and post-visit activities. Referring to such constraints, Hofstein, Bybee, and Legro (1997) suggested that National Education Standards can be used as a mechanism for bridging formal and informal science education. Within this framework that stresses the possible contribution of museums to cognitive aspects of learning, they emphasized the importance of preparation in reducing novelty effects and increasing learning.

In the typical museum visit, a guide is lecturing about the various objects, the group moves together from one object to another, and social interactions among students, teachers, and museum guides are not common (Cox-Petersen et al., 2003). Even when a teacher is leading the visit by using task-sheets, social interactions of teachers, students, and chaperones are not common (Griffin & Symington, 1997; Kisiel, 2003). Griffin (2004) suggests looking at teachers in museums as well-intentioned novices who use some previous experience to inform their practice. She suggests that proper professional development might help teachers in functioning in museum settings. In a meaningful museum visit, students should be encouraged to investigate the exhibit on their own and in small groups; engaged in social interaction with classmates and adults (teacher, guide, chaperones); and encouraged to ask questions, and speak about their past experiences. It is necessary that the teacher plays a central role in such museum experience (Falk & Dierking, 2000; Hein, 1998). This expectation is at the background of this study, which attempted to look at teachers’ function and to describe their roles in class visits to Israeli natural history museums.

THE STUDY

Although we indicated that our study follows up previous study of Griffin and Symington (1997), there are unique aspects that justify the study. Unlike museum visits in other countries, which are described in the literature, the vast majority of class visits to museums in Israel are conducted by museum personnel and not by the teachers (about 90% according to the directors of museums 1 and 4). Nevertheless, all the museum directors we interviewed prior to the study claimed that collaborating with the teachers is a major challenge they struggle with. Our own previous experience with Israeli students and field trips (Tal, 2001, 2004b) indicates that when teachers are heavily involved in the field trips, the learning experience is more substantial, cognitively, as well as socially and affectively. Therefore, the research questions that directed the study focused on the teacher’s role before, during, and after museum staff-guided class visits, followed not only previous American and Australian studies, but addressed challenging issues of the Israeli field trip patterns as well.

The following research questions, with regard to guided school visits were created based on our experience, previous studies, and initial interviews with the four museum directors:

1. What was the teachers’ involvement/role in planning the class visit?
2. What was the teachers’ role during the class visit?
3. What preparation and follow-up activities did the teachers provided?
4. What was the teacher’s perception of the visit?

A unique example of a few teachers who visited one of the museums with their three 5th-grade classes enabled us to present the different approach of one school, which might serve as guidelines for exemplary school visit to NHM.
The Settings

Four natural history museums were selected for this study: small (museum 4) and medium size (museums 1, 2, 3), urban and rural institutions. All the museums provide educational programs and are visited by thousands of students per year. Three museums are located in the metropolitan area of Tel-Aviv (museums 1, 2, 3), and one is located in the rural Upper Galilee (museum 4). Institutions 1 and 4 hold major collections, while the other two centers were designed mainly for educational purposes. The four institutions presented different foci and guiding styles, addressed diverse student populations, and were miscellaneous with regard to their exhibits and educational staff. There are various names for the educational staff in the literature, such as docents, teachers, explainers, and so forth. In this study we adopted the general term guides. As explained earlier, because of the Israeli situation, all the class visits observed and documented for this study were guided by museum professional guides. All the guides were employees, who work at least few hours per week at the museums. Another term, which needs to be defined here, is natural history museums. Although the four institutions include a museum, natural history centers, and a zoological garden, we followed Falk and Dierking (2000, p. xi), and these institutes are referred to here as museums. The museums’ general characteristics, as were observed and described by their staff, are presented in Table 1. Although three institutes were at the Tel Aviv metropolitan area, the geographical distribution of the visiting schools covered the whole country.

TABLE 1
Museum Characteristics

<table>
<thead>
<tr>
<th>Museum (Code)</th>
<th>Special Characteristics</th>
<th>Guiding Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (NC)</td>
<td>Located within a university. Focuses mainly on the zoological garden; aims to make use of the national natural history collections, which are stored at the university. Target student population: secondary schools (grades 6–12)</td>
<td>Graduate students at the life sciences faculty, who guide as part of their teaching assistantship</td>
</tr>
<tr>
<td>2 (ML)</td>
<td>Was built for educational purposes. Includes an exhibit wing and an educational center, which holds a few halls, arranged differently for each activity. Target student population: elementary school (grades 1–6)</td>
<td>Professional guides, holding a BA in biology, most of them have a teaching diploma</td>
</tr>
<tr>
<td>3 (ME)</td>
<td>Was built for educational purposes. Includes a main exhibit wing and a large classroom that is being used for art and drama activities. Target student population: elementary and junior high school (grades 1–9).</td>
<td>Professional guides, holding BA in various fields most of them have a teaching diploma</td>
</tr>
<tr>
<td>4 (BO)</td>
<td>Was established in order to preserve and exhibit rare specimens of the region. Includes two separate halls, one presents archeology of the region and the other presents the wildlife. Provides outdoor activities in the wetland area as well. Target student population: grades 4–11</td>
<td>National Service women (age 18–21); Professional natureguides</td>
</tr>
</tbody>
</table>
TABLE 2
Museums, Teachers, and Grade Levels

<table>
<thead>
<tr>
<th>Museum</th>
<th>Teachers by Grade Level</th>
<th>Total Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, NC</td>
<td>7 5 8 10 8 10 8 7–8 10 9</td>
<td></td>
</tr>
<tr>
<td>2, ML</td>
<td>3 3 3 3 3 7 7 3 3 8</td>
<td></td>
</tr>
<tr>
<td>3, ME</td>
<td>6 6 7 7 4 4 3 5 5 9</td>
<td></td>
</tr>
<tr>
<td>4, BO</td>
<td>6 5 5 5</td>
<td></td>
</tr>
</tbody>
</table>

Participants

Out of about 40 class visits to the various museums, which we observed, 30 teachers agreed to be interviewed for this study. Table 2 presents the teachers by museums and grade level. The numbers in each cell represent the grade level of each teacher.

The visits were selected randomly from those schools that already coordinated their visit at one of the institutes. Except for one group of 5th graders, which visited museum 1 on a special program for gifted students, and two 5th-grade classes from a science magnet school that visited museum 3, all the schools were regular public schools from urban areas, small towns, and Kibbutz schools. The museums were visited during two following school years at 2003–2004.

Data Collection

Each teacher/school was approached a few days prior to the visit, in order to get its permission, and to inform the teacher about the videotaping and the interview.

Each class visit was coded for the museum’s initial, date of visit, researcher initial, and students’ grade level. For example code NC/010104/O/6 represents museum 1 (NC), January 1st 2004, researcher initial (O), and grade 6. The codes were marked on the teacher’s interview, the videotape, and its written subscription and analysis.

Interviews. Thirty teachers, who gave their consent were interviewed either at the end of the visit or by telephone at the following evening. The teacher’s semistructured interview followed a written protocol but allowed further elaboration when required. The questions addressed the planning process and activities in school and arrangements made with the museum staff prior to the visit; the visit plan and activities; and one question that focused on a follow-up activity at school (see Appendix A). Each teacher interview lasted for about 15–20 min. About half of the interviews were audiotaped and transcribed; in the other half, the researcher wrote up the full answers. Only three teachers declined audiotaping, and only one teacher declined interviewing.

Observations. Each visit was videotaped by two coauthors who are trained data collectors in museum settings. One of them had previous experience in museum study in her master’s degree research, and the other has 20 years of experience in the field of outdoor education. Their training process included pilot stage of data collection, in which we learned how to properly use the digital cameras, and obtain good voice recordings with minor interference. The study required the approval of the research department of the Ministry of Education as well, which reviewed the data collection process. The data collectors took notes as well, while videotaping, in order to record and emphasize key events for more focused observation. The observations began at the moment the school bus entered the museum’s
parking lot, grasping the very first moments of orientation, teacher’s directions, and meeting the museums guide. For this study we focused on the teacher’s actions and on the teacher–students and teacher–guide interactions during the visit.

The data collected by both instruments was transcribed verbatim and inductively analyzed so that information relevant for each question was classified and interpreted accordingly. In classifying the data to categories, we followed previous studies of teachers’ function in science and NH museums (Cox-Petersen et al., 2003; Griffin & Symington, 1997), from which we used categories such as teacher’s purposes for choosing the tour, class-based preparations, teacher’s follow-up plans, learning topics and their link to school curriculum, and the teacher’s opinion/evaluation of the tour.

FINDINGS

Teacher’s Roles and Involvement in Planning the Visit

In order to answer the first research question, regarding the teachers’ involvement/role in planning the class visit, we asked the teachers three related questions (see Appendix A, items 2–5). Most of the interviewed teachers provided general answers to the purpose of the visit, such as “enrichment,” “learning about animals,” and so forth. In many cases the teacher stated that other people in school coordinated the visit and she/he was not aware of the purpose. Only a few teachers indicated a specific goal for the visit. Table 3 presents the distribution of the various purposes for the class visits, as expressed by the teachers.

Table 3 indicates that only 10 teachers provided specific purposes for conducting the museum visit. These teachers elaborated while explaining how the visit is connected to what is being done in school. It is worth noticing the high number of teachers who indicated that they were not involved even in reserving the visit.

In order to fully understand the roles of the teachers in planning the visit, we asked about the topic of the visit and the way it addresses the class curriculum. In very few cases we identified such a match. In most cases, the schools perceived the visit as a general enrichment, which is considered as a positive educative experience. Therefore, many teachers, who came

<table>
<thead>
<tr>
<th>Purpose</th>
<th>No. of Teachers</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>General enrichment</td>
<td>5</td>
<td>“It (the museum) provides enrichment to the topic of animals” (ML/291203/N/4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“so that the students would be exposed to the university, especially if the students are from Jaffa (an unprivileged urban center)” (NC/230204/N/10)</td>
</tr>
<tr>
<td>Referring to a specific learning topic</td>
<td>6</td>
<td>“Water is a major topic of this year” (ME/280503/O/7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“We teach about the human body” (ME/041103/O/6)</td>
</tr>
<tr>
<td>Well-defined purpose</td>
<td>4</td>
<td>“We summarize the topic ‘Senses and Sensors’ through this visit” (ME/010304/N/5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“We come every year when we study about reproduction” (NC/140503/Y/8)</td>
</tr>
<tr>
<td>Does not know/was not involved/tradition in school</td>
<td>14</td>
<td>“The field trip coordinator decided, she did not consult with us” (ML/040603/O/3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“We come through a company that arranges field trips” (ME/250304/N/3)</td>
</tr>
</tbody>
</table>
with their classes, were not the science teachers, and knew nothing about the natural history contents of the curriculum.

The interview data indicates that the majority of the teachers who visited the museums with their classes did not take an active role in planning and preparing the museum visit. Most of the teachers stated that other staff members in school, such as the science department head, the secretary, or the outdoor activity coordinator initiated and/or coordinated the museum visit. In most of the cases “coordinating the visit” meant calling the museum, selecting an activity from a list or by recommendation of the museum coordinator, and reserving a date. Statements such as “I think that the coordinator planned the visit,” or “the visit is connected to the curriculum, the secretary coordinated it” were quite common. Only a small minority of the teachers indicated that they coordinated the visit according to the class curriculum. Two of these teachers indicated that it is a tradition in their school to have this particular visit (senses and sensors) in 5th grade.

The Teacher’s Role During the Class Visit

The data that allowed us to address this research question (# 2) was obtained by videotaping the class visits and by focusing on the teacher’s actions and interactions during the visit. Like Griffin and Symington (1997), we observed a few patterns of teachers’ behaviors: teachers who helped or talked to small groups of students, teachers who were looking at the exhibit with a few students, teachers who were quietly standing behind, and even teachers who were chatting with the chaperones. In one case, the teachers were found chatting outside the building.

In the vast majority of our observations (about 30 out of 40), in all the museums, we identified very limited guide–teacher interaction. The teachers were passive with regard to the visit plan, and helped the guides mainly with discipline issues. We observed only about 5–7 teachers who were actively involved in enacting the program, and who initiated or mediated some of the activities. Only 4–5 groups presented a different pattern of guide–teacher interaction, in which, for example, a science teacher, who visited museum 1 several times, interfered in the lecture and explained various concepts and ideas to his students, although some of his explanations were incorrect (NC/260104/N/11); in another case, two qualified environmental education teachers were very dominant during the activity, at museum 4 (BO/011003/OY/5). These teachers were unique for their experience in teaching in the outdoors. Their school runs a school-based environmental education curriculum that serves as an organizer for the whole curriculum. The teachers knew the museum very well, and were able to guide their students throughout the activity. This pattern of teachers’ behavior, which is detailed in the fore, was different than all the other patterns of visits we observed.

Most of the interactions the teachers had with their students, as well with the museum guides, were technical. The teachers helped with organizing the students, maintained order and discipline, but did not play a role with regard to the educational activity. Table 4 presents some examples for teacher–guide and teacher–students interactions as were observed during the class visits.

Preparation and Follow-up

Preparation. In the vast majority of cases (25 of 30), there was not a proper preparation in school. Most of the teachers reported merely about technical directions they provided regarding clothing, food, and visit hours. The teachers could not indicate about specific requests made by the museum staff, or about learning materials provided by the museum prior to the visit. The indicators for teachers’ preparations and preparedness and main findings, obtained by the teacher’s interview are presented in Table 5.
<table>
<thead>
<tr>
<th>Museum Visit</th>
<th>Guide–Teacher Interaction</th>
<th>Teacher–Student Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 NC/020603/O/5</td>
<td>Technical only: in asking the teacher to tell the students to be quiet, and to gather them for the activity.</td>
<td>Mainly keeping the students quiet. In the activity phase, the teacher circulated among the students watching what they do. She did not discuss with them or suggest help.</td>
</tr>
<tr>
<td>1 NC/140503/Y/8</td>
<td>Technical only at the first part; none at the second part.</td>
<td>Focused on discipline; at the second part, the teacher insisted on summarizing what the guide said to her students (preparing them to class wrap-up discussion). Occasionally she encouraged the students to answer the guide's questions.</td>
</tr>
<tr>
<td>2 ML/210503/Y/3</td>
<td>At the fossils activity, the guide assigned the teacher and the chaperone mothers to certain roles. They all help the students.</td>
<td>Mainly during the fossils activity.</td>
</tr>
<tr>
<td>2 ML/210503/O/3</td>
<td>Almost none; only when the guide needed the teacher's help she asked for her name.</td>
<td>Technical.</td>
</tr>
<tr>
<td>3 ME/041203/Y/4</td>
<td>The guide collaborated with the teacher during the drama activity. She used the teacher's help, and suggested a follow-up activity at school.</td>
<td>At the first part (drama) the teacher helped the guide and was very involved. At the exhibit, the teacher went out; she was speaking on her cell phone. The students were left with only the chaperones. One of the fathers helped a few kids, and explained what to do.</td>
</tr>
<tr>
<td>3 ME/280503/O/7</td>
<td>None. The teachers were sitting in the back.</td>
<td>The teachers only asked the students to be silent.</td>
</tr>
<tr>
<td>4 BO/230909/Y/6</td>
<td>None. Toward the end of the introduction lecture, the teacher approached the guide asking him to shorten his talk; the guide ignored her.</td>
<td>Discipline issues only.</td>
</tr>
<tr>
<td>4 BO/011003/O/5</td>
<td>This was the only instance in which the teacher actually &quot;told the guide what to do.&quot; She was a very experienced environmental education teacher, who knew the museum very well, and was able to direct the guide in order to improve the visit.</td>
<td>The teachers were very active. One teacher helped the guide in arranging his activities, because another guide was absent. The teachers helped both with discipline and with the educational activity. They encouraged the students in the game, and answered their questions.</td>
</tr>
</tbody>
</table>
TABLE 5
Indicators for Teachers’ Preparation and Preparedness

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior visit of the teacher at the museum</td>
<td>Less than half of the teachers (13 out of 30) knew the museum from previous visits. Some stated they knew it from private visits.</td>
</tr>
<tr>
<td>Previsit activities</td>
<td>About five teachers indicated that the visit was planned as a wrap-up activity of a topic the class was studying. Other teachers reported about “technical preparations” or about “no preparation.”</td>
</tr>
<tr>
<td>Getting learning materials from the museum</td>
<td>All the teachers stated that they did not receive any materials from the museum. One teacher indicated about the rich website of museum 1, but stated that she did not use it due to time constraints.</td>
</tr>
<tr>
<td>Special requests of the museum staff</td>
<td>Only one teacher reported about the group size requested by the museum. All the other teachers stated that the museum did not have any requests.</td>
</tr>
<tr>
<td>Knowing the program and schedule</td>
<td>Most of the teachers were not aware of the program. Only eight teachers reported that they knew the program. Four teachers indicated that “they knew something,” “a few details,” or the “general idea.” All the other teachers knew nothing. The teachers who knew the program reported that they knew it from previous visits.</td>
</tr>
</tbody>
</table>

Nowadays, a teacher who is interested in a museum and wishes to get materials could use the museum’s websites. Although museums 1, 2, and 4 had active websites, no teacher reported searching for information on the web. The websites of museums 1 and 4 presented very detailed information about the educational programs, and about the purposes of the institutions. Museum 1 has a very rich website that offers updated contents, photos, pre-visit activities, lists of concepts, quizzes, and games. Although, according to the museum educational coordinator, she refers every teacher who calls the museum to the website, no teacher reported looking into this huge reservoir of materials.

The museums can play a role in preparing the schools as well, by providing materials, or suggesting certain preparation. Except for museum 2 that provides inschool preparation which addressed only grades 1–3 in the town where the museum is located, no other preparations were provided by the museums. The person who calls the museum to make reservations speaks with the museum secretary at museums 2 and 4, and with the education coordinator at museums 1 and 3. In both cases, this person gets mainly general information about the program, or is referred to the website at museum 1.

Follow-up. The teachers were asked about the connections between the museum visit and the topics learned at school, and about a wrap-up activity at school. Eight teachers, out of 30, stated that the visit topic is connected to what is being learned in school. Only two teachers indicated about specific ideas that the visit at the museum reinforced (ME/010304/N/5). Only three teachers stated that “they will talk about the visit,” and other teachers said that they are not going to do anything beyond the visit itself.

Teachers’ Perception of Learning

In order to answer the fourth research question regarding the teachers’ perception of the visit, we asked the teachers what they think about students’ learning at the museum and for their general impressions of the visit to the museum. Except for two teachers, who stated that
TABLE 6
Teachers’ Perception of Student Learning

<table>
<thead>
<tr>
<th>Focus of Learning in the Museum</th>
<th>Frequency</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete experiences</td>
<td>19%</td>
<td>“Looking at the models…” “Looking at the exhibit…” “The dinosaurs were so real, the activities focused on concrete experiences”</td>
</tr>
<tr>
<td>Constructivist learning</td>
<td>4%</td>
<td>“The game made them deeply engaged in learning new ideas…” “The classification activity was important, it made them organize their knowledge”</td>
</tr>
<tr>
<td>General statements</td>
<td>15%</td>
<td>“Good learning experience, the kids enjoyed a lot” “New concepts”</td>
</tr>
<tr>
<td>Referring to contents</td>
<td>28%</td>
<td>“They learned about limbs and motion” “Reproduction and relevant organs and sexual behavior” “Mainly about the water cycle”</td>
</tr>
<tr>
<td>Referring to methods</td>
<td>19%</td>
<td>“The pantomime activity was excellent, and the game” “The game was excellent and made thing clearer”</td>
</tr>
<tr>
<td>Enrichment</td>
<td>15%</td>
<td>“Mainly enrichment” “Enrichment! Mainly in art and pantomime”</td>
</tr>
</tbody>
</table>

they came with their classes mainly for fun, not for learning, most of the teachers referred to the kind of learning, contents, methods used by the guides to reinforce learning. Many of these teachers indicated that the students had fun as well. Table 6 presents examples of teachers’ excerpts classified according to the focus of their response, and frequencies of these categories. The total number of responses was 47. Other responses addressed abilities of the museum staff.

The teachers’ general feedback was quite positive. Most of them reported that “in general, they enjoyed the visit a lot.” About half of the teachers addressed the issue of learning in the museum generically. Responses such as “going outdoors is already enough,” “it is an opportunity for enrichment,” and “students get to understand better” were typical. Other teachers suggested various future improvements or raised issues of concern. Examples for the teachers’ more detailed responses are provided in Figure 1.

The teachers were very articulate in their responses and highlighted a few concerns such as too much lecturing, lack of connection between the concepts discussed at the museum visit and the students’ previous knowledge, not enough time for free choice investigation, and movies that are not relevant. These comments of the teachers brings us back to the issue of coordinating the museum visit, planning the educational experience, and inadequate collaboration in planning and enacting the field trip. The case of “Rainbow School” might provide a different example for such relationships.

The Case of “Rainbow School”

Teacher: There was a kid, who was very excited. So one of the girls asked him why he’s so excited. Of course he was excited; he took the game very seriously! He was very engaged! It is really exciting here; I saw many children who wanted to do more (game) cards, you were all great! (BO/011003/O/5)
This teacher’s response represents the enthusiastic approach and the high level of commitment of the five teachers from Rainbow School, who visited museum 4. Rainbow School—a community elementary school—runs a school-based environmental education (EE) curriculum. The school operates a complex field trip program, which is linked to the EE curriculum. Two EE teachers plan, coordinate, and enact all the field trips of that school. Three 5th-grade classes visited museum 4 with their three homeroom teachers and two EE teachers (BO/011003/Y/5; BO/011003/O/5). According to the interview with one of the EE teachers, this museum visit was the third visit to the area. Two field trips were executed during fourth grade. In addition to this previous learning, as part of the preparation in school, the teachers let the students find the museum location on a map. Then, they told them about the uniqueness of this museum, which exhibits the unique wetland habitat of the northern part of the Syrian-African Great Rift Valley. The main concepts such as a habitat, adaptation, morphology, and function were discussed in class. When the introduction talk at the museum began, the students were very eager to answer the guide’s questions.

Guide: Who could tell us where we are located?
Students: (shout) “Hula Valley” and names of towns
Guide: this region is very unique, you know. There is this mountain above us . . .
Students: Mt. Hermon
Guide: and there are three rivers that join to create the Jordan River. Banias River, Hazbani River . . . and
Students: Dan River

One of the main topics of 5th grade at that school is “Organisms and Adaptation to Habitats.” The aim of the museum visit, according to the EE teachers, was to observe and discuss various types of adaptations and functions of wetland birds. The teacher, who
coordinated the museum visit, requested that the learning activities would focus on that idea. She knew the plan and the schedule of the visit, and she knew the “predator–prey” game from previous visits.

When the buses arrived at the museum, the homeroom teachers watched the students, and instructed them to sit and eat at the museum yard. Then, the EE teachers went into the museum building to meet and speak with the guides. Only then, they were informed that one of the guides was absent. The other guide seemed quite helpless, realizing that there were 68 students waiting for him. The more experienced teacher, asked again for his plan for the morning, and then, suggested to divide the students into two groups, and to help him. In later stages, she was observed keeping the schedule and navigating between the two groups, asking and getting the help of the other teachers in organizing the children. The three homeroom teachers were very active during the introductory talk and the “predator–prey game”, by moving from one group to another, reading the descriptions cards with the students, and asking them questions.

In the interview, the EE teacher explained that

I felt that the guide was relatively inexperienced, and that I’d better help with organizing the groups and the activities, so that the groups would not interfere with each other. I explained a few things to the first group, because the other one still occupied the exhibit room.

The well-organized collaboration among the four teachers left the museum guide with very little work at that stage. The students, who were deeply engaged in the activity, approached mainly their teachers, asking them about the content of the exhibit, while the guide stepped out of the exhibit room for about 5 min.

The EE teacher, who was very experienced in outdoor learning, knew the museum from many visits in past years, and was able to guide the whole activity alone. In the interview, she said that she would like her students to meet with experts, in that case—a museum guide; however, at that particular event, she realized that she had to help the guide in order for the visit to succeed.

Since this visit was part of a sequence of learning at school, other learning activities, which reinforce the topics highlighted on the field trip, were planned for the following weeks. The students continued learning about habitats and adaptations focusing on different habitats, mainly on plants, and another bird watching activity was held focusing on woods birds.

In the visit of Rainbow School to museum 4, it was evident that the teachers perceived the museum visit as part of the learning sequence in school. They defined the objective for the visit and prepared the students, they knew the program in advance, and were able to carry out a meaningful visit, with very little help of the museum guide. Postvisit activities, according to the teachers, are part of the routine teaching at that school, which perceives the field trip as an essential element of the EE curriculum.

DISCUSSION

There are several reasons for taking school children to museums: science enrichment, increase exposure to science, social experience and entertainment, and having concrete experiences with abstract and complex phenomena (Griffin, 2004; Michie, 1998; Olstad & Kubota, 1991; Orion, 1993; Orion & Hofstein, 1994; Rennie & McCafferty, 1995, 1996). Unfortunately, the majority of the teachers who were interviewed for this study could not specify the reasons for their visit. One reason for this is the fact that most of the teachers were sent by someone at school to watch their students. Most of them were not involved in planning the field trip and planning or choosing the learning activities. Another reason
might be that teachers perceive the field trip as a fun event and not as a well-planned educational experience. The international literature draws more or less the same picture: teachers, in general, do not prepare their students to museum visits. They provide mostly technical information, and they rarely enact previsit activities that aim to reduce innovation and to connect the museum visit to the class curriculum. The teachers view museum visits as field trips where the students see interesting things and have fun (Kubota & Olstad, 1991; Cox-Petersen & Pfaffinger, 1998; Griffin, 2004; Griffin & Symington, 1997; Hicks, 1986; Kisiel, 2003; Hein, 1998; Michie, 1998; Olson, Cox-Petersen & McComas, 2001). Unfortunately, Israeli teachers fit this description. Although the last summary of activity in Israeli museums (Carmeli & Shavit, 2001) indicates that 22% of all museum visits in Israel are guided school visits, and although three of the participating museums (2, 3, 4) have conducted teachers’ professional development on the year of the study, we found no difference with regard to the museum or the students’ grade level. Only a very few teachers indicated that they coordinated the field trip, based on the class curriculum, and only a very few teachers indicated about previsit activities, or described the museum visit as a wrap-up activity to a topic which was studied in class. As Muse, Chiarelott, and Davidman (1982) indicated, the key to successful field trips is the teacher’s capability in organizing, sequencing, focusing and evaluating the event for the needs of each student, and in providing an experience consistent with the outcomes desired.

Rennie and McClafferty’s (1995) answer to the question what teachers do during their class visit is the same answer we give for Israeli teachers. Most of them passively follow the museum guide, help with keeping the order, and watch their students. Only the teachers of Rainbow school performed different behavior. The literature indicates that when there is no museum guide involved in the museum activity, which is often the case in the US and Australia, for example, the teachers are responsible for the museum excursion, even if the activity they provide is quite limited (Griffin & Symington, 1997; Kisiel, 2003; Michie, 1998). In our study all the visits were guided by museum staff, and allowed the vast majority of the teachers to remain passive.

The teachers’ articulated critique toward the visit plan and enactment is quite a hindsight. It highlights the question whether teachers discuss objectives for visiting museums and aware of their expected roles in conducting successful visits as indicated already in the Commission on Museums for a New Century (1984), and reinforced by Griffin and Symington (1997) who recommended that museum visits should be integrated with the curriculum and that learner-centered approach should be used, and students should answer their own questions. These questions should initially be discussed prior to the visit.

A possible answer is provided by Olson et al., (2001). While all the teacher training programs focus on class-based teaching and in the last decades on inquiry-based learning and technology use, very few programs involve the preservice teachers in field-based, outdoor learning experiences (Rickinson et al., 2004). The teachers do not get enough experience, and do not apply their professional pedagogical knowledge on museum settings. Issues such as formulating teaching objectives, selecting contents, and suggesting teaching methods for the museum learning experience are not part of their considerations. This is supported as well by Tal (2001, 2004) who studied preservice teachers participating in field trips. She found that the students were more likely to develop and enact field experiences after deep involvement in thinking about learning experiences in informal settings, and after experiencing a constructed approach to field trips.

The case of Rainbow school might represent schools and teachers that already acquired such teaching experiences in outdoor environments and use these environments for everyday teaching in school. Only experienced teachers in museum and other informal settings might apply a learner-centered approach as they are aware of various learning styles in the outdoors
as well as in class, and encourage social interaction as suggested by Griffin and Symington (1997).

On the other hand, a disturbing issue that came up in this study and seems typical to Israeli schools these days should concern everyone who is interested in learning in museums and other outdoor settings. Private and public companies that become subcontractors and manage the whole arena of outdoor activities come between the teachers and the curriculum. As a consequence, the outdoor activities of many schools are turned into solely enrichment activities. Unfortunately, because only four teachers directly indicated about “field trip companies” and other teachers could not indicate who arranged the field trip, we did not present this aspect in the Findings section. However, the issue of field trip outsourcing is worth studying in a future study.

**Museums’ Role**

Is the museum educational staff responsible as well? This study focused on teachers; however, our findings indicate that the museum staff is accepting this reality of uninvolved teachers and a substantial gap between the school curriculum and learning and the museum learning and does not make serious attempts to change it. According to the Israeli museum survey (Carmeli & Shavit, 2001), three of the museums described in this study conduct professional development programs for teachers as well. Unfortunately these activities focus mainly on visiting and knowing the museums the exhibits and not on the pedagogical issue of how to conduct a successful museum visit.

**Implication and Further Research**

As a consequence of this study, we suggested and developed a 56-h professional development course with four educational coordinators of museums and science centers in the city of Haifa. In this course, the teachers would discuss the museum learning experience and would collaborate with museum staff in order to jointly develop school visits. The teachers, then, are supposed to visit the museums with their students and to engage in an active approach by preparing the students, team-teaching at the museum with the museum guide, and finally, develop and enact a postvisit activity in school. In addition, an undergraduate elective course in teaching in informal settings was opened at the Department of Education in Technology and Science at the Technion.

Following-up these groups of teachers in the next few years would allow us to assess their attitudes, perceptions, and performances in teaching in out of school settings, or in coordinating such experiences.

**APPENDIX A. TEACHER’S INTERVIEW**

1. Role in school: a) homeroom teacher b) advisor c) professional teacher (sciences/social studies/language arts) d) department head e) other ——.

**Preparation**

2. The reason/purpose for visiting the museum
3. Does the teacher know the museum from previous experience? What type?
4. Who and how coordinated the museum visit?
5. How the visit was planned? What was the teacher’s role in coordinating the visit/planning the activities?
6. Was there any pre-visit preparation? How long before the visit? Please describe the preparation.
7. Did the museum send/provide any materials to the school/teacher?
8. Did the museum have any requests such as preparation, size of groups, accompanying teachers ...?
9. Is it a single experience at the museum, or one of a series of visits on a continuous program?

The Visit

10. Did the teacher know the program of the day and the time allocated to each part?
11. What the teacher thinks about students' learning on the visit?
12. What are the general impressions of the teacher about the visit to the museum?

Postvisit

13. Are there any post-visit activities at school? How does the visit connect to what is being learned in school?

This research was funded by the Israel Science Foundation.

REFERENCES

Hicks, E. C. (1986). Museums and schools as partners. ERIC Digests No. ED278380.