INESJOURNAL
ULUSLARARASI EĞİTİM BİLİMLERİ DERGİSİ
THE JOURNAL OF INTERNATIONAL EDUCATION SCIENCE

Yıl: 2, Sayı: 4, Eylül 2015, s.143-155

Dilan BAYINDIR[1], Fatma Nevra SEGGIE[2]

TEACHERS' PERSONAL AND PROFESSIONAL USE OF INFORMAL LEARNING INSTITUTIONS: FOCUS ON A BOTANIC GARDEN*

Abstract

The main purpose of this study is to explore the reasons why teachers do personal visits and take their students to informal science learning institutions, with a focus on botanic gardens. A questionnaire developed by the researchers was used to collect data from 149 Turkish elementary school teachers. The findings indicate that all of the following nine factors (Falk and Dierking, 2000; Falk, Moussouri & Coulson, 1998; Kisiel, 2005; 2006; Michie, 1998) to connect with the classroom curriculum, to provide students with a general learning experience and a new experience, to encourage students in lifelong learning, to enhance students' interest and motivation, to provide a change in setting or routine, to provide enjoyment, to meet school expectations, to contribute to the socialization of students, and to enjoy the physical setting; were influential. Also, a significant relationship was found between teachers' personal interest and the field trip experiences of their students.

Key words: botanic garden, informal learning, museum, science education

INTRODUCTION

Learning is a process that occurs in different contextual environments. While some of learning occurs in a formal context such as school, much learning takes place in informal contexts, such as watching television, reading a newspaper, talking with friends, surfing the internet, and visiting a museum (Eshach, 2007; Kisiel & Anderson, 2010; Falk & Dierking, 2000; Osborne & Dillon, 2007; Rogers, 2002). Recently, out-of-school learning has been a frequently studied subject in educational research. There are two main categories of out-of-school learning: non-formal and informal learning. The key distinction between informal, non-formal, and formal learning/education is in the context of learning (Jarvis, 2002; Rogers, 2002, 2004;

[1] Arş. Gör., Marmara Üniversitesi, Eğitim Fakültesi, Okul Öncesi Öğretmenliği, dilanbayindir@gmail.com
[2] Doç. Dr., Boğaziçi Üniversitesi, Eğitim Fakültesi, Eğitim Bilimleri, nevra.seggie@boun.edu.tr

*This study was conducted as part of Dilan Bayindir's work on the thesis for a master's degree.

Schugurensky, 2000). Jarvis (2002) defines formal education as "the hierarchical structured educational system introduced by the most states extending from primary school to graduate programmes in universities" (p.72). Informal education is one of the confusing concepts. Schugurensky (2000) stresses that it is not possible to define informal education because there is no educational institutions, instructors and curriculum in informal learning process. The last concept, non-formal education is defned as "the educational process organized outside of the formal educational system often to respond to the learning needs of specific groups" bu Jarvis (2002, p.129). There is some debate about how learning in informal learning institutions like museums, nature centers, aquariums, and botanic gardens can be categorized. Eshach (2007) stresses that learning which occurs in an "informal" learning institution cannot be categorized as informal learning because such places are constructed for educational purposes, and they offer structured learning activities. He claims that this learning is a form of nonformal learning, which "…occurs in a planned but highly adaptable manner in institutions, organizations, and situations beyond the spheres of formal or informal education. It shares the characteristic of being mediated with formal education but the motivation for learning may be wholly intrinsic to the learner" (p. 173). Botanic gardens, the focus of this study, have physical and sociocultural contexts for learning about environmental and botanical science; thus it can be said that "nonformal" learning may occur in these places. Dierking, Falk, Rennie, Anderson & Ellenbogen (2003) describe this type of learning as self-motivated, cumulative, and mediated by sociocultural and physical factors. Falk and Dierking (2000) suggest a structure for this learning in their Contextual Model of Learning Theory, which defines the important contexts--personal, physical and sociocultural--that affect learning. This theory and related research (Eshach, 2007; Falk et al., 1998; Kisiel, 2006; Michie, 1998) on student field trips to informal learning sites like botanic gardens are instrumental in this study. Using this theoretical framework, the study aims to explain the reasons why teachers make personal visits and take students to the Nezahat Gökyiğit Botanic Garden (NGBB) in Istanbul, Turkey.

It will explore: (1) the reasons why elementary school teachers take their students to informal science learning institutions, specifically to a botanic garden; if is there a possible relationship between teachers' characteristics (teaching experience, subject taught, faculties from which teachers graduated, personal interests, perceived effectiveness when teaching the topic of plants) and contextual characteristics (school type, the perceived socio-economic status of the school population); (2) the reasons for elementary school teachers' personal visits to informal learning institutions and (3) whether there is significant relationship between teachers' interests and the field trip experiences they offer to their students.This study attempts to identify valuable information on reasons affecting Turkish elementary school teachers in their decision to take their students to informal science learning centers. Knowing about teacher agendas and their reasons for organizing field trips may help informal learning institutions to negotiate with teachers and increase the number and the success of school group visits.

REVIEW OF THE LITERATURE

The Contextual Model of Learning

The model states that three contexts—the personal, physical, and sociocultural—contribute to the learning process in informal learning institutions (Falk and Dierking, 2000) and that "learning is the process/product of the interactions between these three contexts" (p. 10). The

importance of the personal context in terms of prior knowledge, interest, and motivation (Adelman, Falk & James, 2000; Dierking et al., 2003; Falk & Adelman, 2003; Hong & Song, 2013) the sociocultural context (Crowley & Colloman, 1998; Dierking et al., 2003; Hong & Song, 2013) and the physical context (Dierking et al., 2003; Falk & Bolling, 1982; Hong & Song, 2013; Kubota & Olstad, 1991) has been stressed in many other studies. The model provides a widely used framework for understanding learning, specifically in museum-type settings (Phipps, 2010). The personal context includes an individual's motivations, expectations, prior knowledge, and level of control (Falk & Dierking, 2000). A study done by Falk and Storksdieck (2005) indicates that use of the Contextual Model of Learning can clarify how the interaction between factors influences visitor learning. According to the model, learning is a highly personal activity in which motivation is an important component. However, some other factors, such as a safe and motivating environment that offers meaningful activities and gives control of learning to the learner will increase the motivation to learn. The sociocultural context in which a learner lives determines what and why that person learns. Falk and Dierking (2000) state that interactions between people are important in organized field trips. Interactions occur within a visiting group and between the group, the group leader, and museum professionals. These interactions affect the quality of the museum experience. The model claims that "spatial learning is not just a specialized and isolated type of learning but is integrated with all types of learning" and that "all learning is influenced by the awareness of place" (p. 65). At the beginning of organized trips, according to Falk and Dierking (2000), free time should be provided to visitors, in which to explore the place, become familiar with their surroundings, and avoid a sensory overload. This study benefits from this model in a few stages. The model influenced the questions that have been asked to the participants and how the researchers analyzed and interpreted the data.

Botanic Gardens as Informal Science Learning Sites

The first botanic gardens were established in order to teach about botany and medicinal training (Heywood, 1991; Willison & Green, 1994). Today, general education is also one of the functions of botanic gardens, as well as conservation, research, and recreation (Galbraith, 2003). A survey conducted by Kneebone (2006) of over 120 representatives of 117 botanic gardens indicates that 91% of today's botanic gardens include education in their scope and have separate budgets for educational facilities. The results of a study done by Morgan, Hamilton, Bentley & Myrie (2009) record some of the ways in which gardening activities in a botanical garden contribute to students' academic skills, knowledge, and positive attitudes toward the environment. Botanic gardens provide stimulating learning environments by documenting plant collections, running scientific activities on plant and animal life, and providing educational facilities. These characteristics make botanic gardens excellent informal learning institutions that attract many people to visit, learn, and enjoy the physical environment. Thus they are attractive also to teachers, who see them as a destination for field trips. The literature indicates that teachers often feel themselves unqualified to teach environmental concepts to their students (DeMarco, Relf & McDaniel, 1999), so the availability of botanic gardens as informal learning sites gains importance. Since modern learning theories emphasize the importance of the environment, both social and physical (Rogers, 2002), studies of learning in informal learning institutions like botanic gardens are needed.

Reasons for Visits to Informal Learning Sites

Falk et al. (1998) studied the motives and strategies of adult visitors to explain why they visit informal learning institutions. Their study indicates that there are six motives (place, education, life cycle, social event, entertainment, and practical issues) and three strategies (unfocused, moderately focused and focused) for visits.

It is necessary to understand teachers' reasons for taking students to informal learning institutions, because their reasons affect the learning experience (Kisiel, 2005). Understanding their reasons is the key to increasing the number of school trips and making field trips more effective (Anderson, Kisiel & Storksdieck, 2006).

Science field trips are a part of formal schooling and students are aware that in addition to being enjoyable, field trips have anticipated learning outcomes (Eshach, 2007). Many studies identify the benefits of science field trips for students. The benefits are generally separated into two domains: cognitive and affective (Eshach, 2007; Kisiel, 2006; Liddicoast & Kransny, 2014; Wyles, Pahl, White, Morris, Crocknell & Thompson, 2013). Contributions to the affective domain directly help to increase student enthusiasm about science, indirectly lead to understanding in the cognitive domain (Wellington, 1990). Also, there are thoughts stress that positive affects on affective domain have greater long-term impact than concept learning (Dewitt & Storksdieck, 2008).

Kisiel (2005) has identified eight factors that lead elementary school teachers to conduct science field trips to informal learning sites: to connect with curriculum, to provide a learning experience, to promote lifelong learning, to foster interest and motivation, to expose students to new experiences, to provide a change of setting, to provide enjoyment or reward, and to satisfy school expectations. Also, two other factors, the socialization of students (Falk and Dierking, 2000; Falk, Moussouri & Coulson, 1998; Michie, 1998) and enjoyment of the physical environment (Falk and Dierking, 2000; Falk et al., 1998) could be added to the list. Among these reasons, research indicates that teachers value curriculum-related programs more than nonrelated ones (Anderson et al., 2006; Anderson and Zhang, 2003). One of the rare studies of botanic garden field trips indicates that the most important reason why teachers take their students to a botanic garden is to connect the trip with an instructional unit in the classroom (Steward, 2004). So, this is a key point for the staff of informal learning institutions: to motivate teachers to take field trips, connect your place and your program with the school curriculum.

METHOD

This quantitative study uses a "cross-sectional survey" method, which is one category of "descriptive research" or "survey research" (Gay, Mills & Airasiar, 2006).

Participants

A "purposive sampling method" (Gay et al., 2006) was used to select the elementary school teachers who conduct field trips to the Nezahat Gökyiğit Botanic Garden (NGBB) in Istanbul, Turkey, taking this sample as representative of the given population. The data for the current study were obtained from 149 teachers:128 women (87.1 %) and 19 men (12.9 %). 60 of them (40.8%) were teaching in private schools, 86 (58.5%) in public schools. When we looked at the distribution of the sample by age and type of school, we found that 70 of the females were from

public schools and 57 were from private schools. The mean age of participants was 39.8 years. Of the 149 participants, 97 were elementary school classroom teachers (65.5%). 21 were science and technology teachers, and 30 were from different disciplines, such as mathematics and literature (N=148, missing=1). 65 of the teachers (41.7%) had more than 15 years of teaching experience.

Context

The data was gathered in Nezahat Gökyiğit Botanic Garden. NGBB is situated in a busy motorway intersection in a residential area of Istanbul. It started as a public park in 1995, it became a botanic garden in 2003. Its stated mission was to document plant collections and conduct scientific and educational activities that explore, interpret, and conserve the plant diversity of the world.

Instrument

A survey questionnaire, "Teacher Perceptions of Student Field Trips to the Botanic Garden" was developed by the researchers – in Turkish, since it was going to be distributed to Turkish teachers. The questionnaire consists of 8 sections. Section A gathered teachers' demographic information; the gender, age, branch, year of teaching experience, the type and the perceived socio economic status of the school they teach in. Section B consisted of three questions about the teachers' personal visits to informal learning institutions. This section includes such questions as "Which informal learning centers you choose to visit personally?", "What is the number of personal visits to informal learning sites in each year?" and an open ended question asks for the reasons for personal visits to informal learning sites. Section C gathered data about the types of informal learning sites to which the teachers took students, how many times they organized student field trips in a year, the perceived support of the school administration for student field trips, the influence teachers had on choosing the sites, and the timing and number of student field trips. Section D, consisting of 28 questions, was structured to investigate the factors influencing the decision to take students to NGBB. Eight of the proposed factors were taken from Kisiel's (2006) research, and two additional factors; socialization and enjoyment of the physical place (Falk and Dierking; 2000; Falk, Moussouri & Coulson, 1998; Michie, 1998) were added. All items took the form of a five-point Likert-type scale, with scores ranging from 1 (totally disagree) to 5 (totally agree). Reliability analysis and factor analysis were repeated after the collection of data. Factor analysis collected two of Kisiel's factors--to provide a learning experience and to expose students to a new experience--into one category. So the total number of factors of the study was nine. The Cronbach's Alpha value of the total scale was found as 0.966. Because the related literature identifies each factor separately, Cronbach's Alpha for each of the 9 factors was calculated separately. Cronbach's Alpha values for F1, F2, F3, F4, F5, F6, F7, F8 and F9 were .873, .859, .862, .923, .757, .832, .666, .800, and .852 respectively. Section E required participants to rank in order of importance five reasons for organizing student field trips to the botanic garden, out of nine given reasons. In section F, they were asked to rank in order of importance the first five factors that affect the success of a field trip to NGBB, out of 11 reasons selected from the related literature. Section G consists of 4 questions about the teachers' experience of NGBB. The last section, section H, consists of two four-point Likert-type questions about teachers' perceptions of their professional adequacy to teach botany and their willingness to participate in relevant training programs.

Procedure

After the development of the first version of the survey, three expert views, teacher views, and views of the botanic garden staff were solicited. Then a pilot study was carried out in order to collect enough data for the reliability test of section D of the instrument. The total number of groups was estimated as around two hundred at the targeted period of time, considering the previous years' data on school visits. Then the pilot study involved 30 teachers, a number kept low by the limited population. Analysis of the pilot study indicated that the instrument had high reliability (Cronbach' alpha of .909). However, corrections on factors were necessary. The number of factors was 12, and after analysis of the pilot study this number was decreased to nine. Reliability analysis and factor analysis were repeated after the collection of data. Reliability analysis produced Cronbach's Alpha of .966.

For the purpose of data collection, NGBB educational staff were trained to provide a standard presentation of the questionnaire to the teachers, who were asked to fill in the questionnaires after the educational activities of their group. Answering the survey questions required twenty minutes.

Data Analysis

For demographic information cross tabulation, frequency distribution and percentiles were calculated. The means of factors that indicate the reasons to organize field trips were calculated to examine the valid reasons. Factor analyses entailed Mann-Whitney U and Chi square analyses to see if the identified factors for taking students on botanic garden field trips differed according to selected teacher characteristics and contextual factors. Careful analysis and coding (Gay et al., 2006) of the teachers' responses to an open ended question asks for their personal visits were done by the researchers. First of all, all the reasons that were cited by the teachers were listed and then these reasons were grouped. The analysis indicated that there are seven categories for personal visits. Furthermore, Chi square analysis were done to study the relation between teacher interest and the informal learning experience they offered to their students.

RESULTS

Analysis of Reasons for Organizing Field Trips to a Botanic Garden

The nine factors were as follows: F1, to connect with the classroom curriculum; F2, to provide students with a general learning experience and a new experience; F3, to encourage students in lifelong learning; F4, to enhance students' interest and motivation; F5, to provide a change in setting or routine; F6, to provide enjoyment; F7, to meet school expectations; F8, to contribute to the socialization of students; and F9, to enjoy the physical setting. The mean of Likert scale scores for all factors was 4.476. The mean scores for each factor were F1, 4.54; F2, 4.5; F3, 4.60; F4, 4.53; F5, 4.29; F6, 4.69; F7, 3.99; F8, 4.52; and F9, 4.55. These means were all close to one another; so each factor is important and relevant to organization of field trips to NGBB. "For enjoyment" received the highest score and "meeting school expectations" received the lowest.

The mean scores of factors did not indicate a normal distribution according to the Kolmogorov-Smirnov Test, so nonparametric tests were used. Mann-Whitney U and Chi square analysis were applied to determine whether or not the mean scores of the factors differed significantly

according to the identified teacher characteristics and identified contextual factors. No significant differences according to years of teaching experience, the teacher's personal interests, or the perceived effectiveness of teaching the topic of botany (p>0,05) were found in any of the scores. Scores of F6 (for enjoyment) and F8 (socialization of students) differed in terms of the subject taught by the teacher (F6; $\chi 2$=6.401, F8; $\chi 2$=8.632, p < 0,05). F6 (for enjoyment) scores indicated differences according to the teachers' university faculty, either education or other (F6; $\chi 2$=6.401, p < 0,05). F5 (to provide a change in setting or routine) scores differed according to the type of school, public or private (U= 1973.5, p<0,05) and the perceived socioeconomic status of the students (F5; $\chi 2$=6.745, =p<0,05). There was no difference in other scores according to contextual characteristics (p>0,05).

When asked to indicate the most important reason for organizing the field trips, 34.6% of the teachers chose "to increase students' interest and motivation."

Chi square analysis also showed no significant difference in the number of student field trips according to the type of school ($\chi 2$ (1, N = 143) = .424, p > 0.05) and the perceived support of the school administration ($\chi 2$ (3, N = 144) = 7.503, p > 0,05). Also, no difference was found in perceived support of the school administration for field trip organization according to school type ($\chi 2$ (3, N = 146) = 1.120, p > 0,05).

Obviously, it is the teachers who make decisions about organizing field trips, including the site, date, and frequency (see Table 1).

Table 1: Teachers' Roles in Student Field Trips

Teachers can choose	Always	Generally	Sometimes	Never
whether they want to organize a field trip or not (*N*=147)	69.40%	21.10%	8.80%	0.70%
what kind of informal learning center they want to go (*N*=145)	69.70%	22.10%	7.60%	0.70%
tha date of the field trip (*N*=144)	64.60%	24.30%	11.10%	
how many times they organize field trips (*N*=147)	66.00%	23.80%	10.20%	

Teachers' Personal Visits to Informal Learning Institutions

The rank of the informal learning institutions visited by teachers personally is as following: history and archeology museums (21.7 %), zoos (17.5%), NGBB (16.5%), science centers (15.0%), aquariums (11.9%), art museums (11.8%), other (3.3.%), other botanic gardens and arboretums (1.3%) and none of them (1.1%).

Nearly half of the responding teachers (47.9%) indicated that they visit informal learning institutions 2 or 3 times a year; 33.6% said they visit once a year; and 13.6% said they visit once in every 2 or 3 years.

Careful analysis and coding (Gay et al., 2006) of the teachers' responses to an open ended question indicated that there are seven categories for personal visits. These categories are personal interest, learning, place, personal development, enjoyment, social events, and professional development (see Table 2).

Table 2: Reasons for Teachers' Personal Visits to Informal Learning Institutions

Motivation	Description	Response *f*	(*N*=100) %
Personal Interest	Teachers visit ILIs to meet their personal interests	44	34%
Learning	Teachers want to learn more about informational and cultural content ILIs carry	33	26%
Social Event	Teachers see ILIs visit as an enjoyable thing to do with family or friends	14	11%
Enjoyment	Teachers visit ILIs to have fun and enjoy themselves	13	10%
Place	Teachers see ILIs as a leisure/cultural destination in itself	10	8%
Personal Development	Teachers see ILIs visit as an experience	9	7%
Professional Development	Teachers visit ILIs to be more knowledgeble for possible student field trips	6	5%

Relationship between Field Trips and Teachers' Personal Visits

Analysis identified a significant relationship between teacher interest and the informal learning site chosen for a field trip; according to type these are science museum ($\chi2$=32.533), zoo($\chi2$=37.049), aquarium ($\chi2$=42.563), history/archeology museum ($\chi2$=16.213), art museum ($\chi2$=22.924), NGBB ($\chi2$=18.784) for p = .000.

Further analysis indicated a significant relationship between the number of personal visits and the number of field trips ($\chi2$ (2, N=136) = 14.141, p = .001). In other words, teachers who make more personal visits to informal learning institutions take more field trips.

DISCUSSION

It was not surprising that all of the selected nine factors for organizing field trips to informal learning institutions were found to be important reasons why the participating teachers organize student field trips to the botanical garden (NGBB). This article uses prior qualitative studies' findings as a base of developed quantitative method and applies it to a different context and different culture. The findings of the study indicate that teacher motivations to organize field trips are similar across cultures and contexts in terms of informal learning institutions. Also, it could be stated that the developed likert type survey could be used by different researchers to study teacher motivations for field trips and by this quantitative method larger populations could be reached and more generalizable findings could be handled. Although the related literature indicates that teachers value curriculum-related experiences (Anderson et al., 2006; Anderson & Zhangs, 2003; Kisiel, 2005; Steward, 2004), connecting a field trip experience with the curriculum is not among the five most important reasons identified by these participant teachers. They ranked the "for enjoyment" factor highest of the nine factors. Furthermore, when they were asked to indicate the most important reason for organizing a field trip, 34.6% selected "to increase students' interest and motivation." These results indicate that Turkish teachers, insofar as field trips are concerned, consider objectives in the affective domain to be more important than objectives in the curriculum. Moreover, a consensus of research indicates that visits to

informal science institutions significantly improve visitors' attitudes toward the event and the topic (Nadelson & Jordan, 2012; Wyles et al., 2013). Contributions in the affective domain directly help to increase enthusiasm toward science and indirectly lead to better understanding in the cognitive domain (Wellington, 1990). Student science field trips are a part of formal schooling, and students are aware that in addition to being enjoyable, field trips also have expected learning outcomes (Eshach, 2007). The link between the field trip and the curriculum ought to be considered by teachers and the staff of the informal learning sites. So, as Kisiel (2006) states, this connection allows students not only to remember what they did, but also why they did it.

The educational service that botanic gardens provide is especially important because teachers often feel themselves unprepared to teach environmental concepts to their students (DeMarco, Relf & McDaniel, 1999). Uno (2009) calls limited knowledge about plants "botanical illiteracy," and he stresses that this results from such factors as lack of interest and infrequent exposure to botanical science. The environmental education and environmental concepts are started to be given in the elementary level. Educational staff in a botanic garden can make an outstanding contribution to science learning in both the cognitive and affective domains. The physical context of botanic gardens is attractive for visitors. The setting facilitates teaching about plant biodiversity, ecosystems, economic, cultural and aesthetic importance of plants, relations between plants and people, the local and global environment, and the problems caused by plant extinction.

Teachers have a very important role in the organization of field trips. In this study, teachers decide whether to organize a field trip or not, the type of informal learning institution to which they will take their students, and the timing and frequency of trips. Furthermore, the research findings indicate that the important role of teachers did not vary according to type of school, whether private or public. This result parallels Kisiel's (2005) explanation that the field trip experience of students is determined largely by the teachers' agendas. The teacher's interest in a topic is advantageous to teaching about that topic. Conversely, a teacher's lack of interest in a topic might be an obstacle. McLeod and Kilpatrick (2001) suggest that since teachers' interests enhance student learning, and informal learning institutions can enhance teachers' interests, their learning in informal learning contexts should be supported. During university education and in-service training sessions, the effectiveness of informal learning can be introduced and awareness of the importance of informal science learning can be fostered. Also, the staff of informal learning institutions and teachers planning a field trip must cooperate to make the field trip successful.

The coding of the open-ended question asking for the reasons for teachers' personal visits identified personal interest, learning, social event, enjoyment, place, personal development, and professional development as reasons. These categories are close to those identified by Falk et al. (1998): place, education, life-cycle, social event, entertainment, and practical issues. The "life-cycle" factor refers to the practice of adults taking children to museums because they themselves were taken when they were young. This was not one of the reasons for visiting informal learning institutions cited by teachers in this study, perhaps because informal learning institutions are new in Turkey.

Furthermore, a significant relationship was found between the types of informal learning institution preferred for personal visits and types chosen for student field trips. For example, if a

teacher is interested in botany, s/he prefers botanic gardens for field trips. Also, there is a significant relationship between the number of personal visits and the number of field trips. Teachers who make more visits to informal learning institutions lead more student field trips to those institutions. This finding is parallel to a study conducted by Kisiel (2005). It seems appropriate, then, to conclude that informal learning institutions should keep contact with teachers and make their sites attractive to teachers if they want to attract student groups.

No difference was found between the frequency of access to informal learning sites afforded to students in private and public schools. This finding supports the claim of Falk and Dierking (2000) that informal learning institutions play an important role in decreasing the gap between private and public schooling by providing the same quality of educational opportunities for all layers of society. This is another important reason to support informal learning institutions. The literature states that informal science learning has an important positive effect on understanding, interest, and attitudes of students towards science. However, teachers, rather than students decide whether or not to visit an informal learning institution. Thus it is important to understand the motives of teachers and to conduct further research on this issue.

The findings of the study may be used by informal science learning institutions as they develop and market educational programs for the benefit of teachers and students.

Limitations and Recommendations

The main limitation of the study is that purposive sampling is used, so it is not possible to generalize from the findings. Furthermore, the questionnaire developed to collect data for the study is quite long. While the questionnaire provides detailed information, it may be seen as time-consuming by teachers (Gay et al., 2006).

Further research on the reasons for participation and non-participation of teachers in informal science learning institutions is necessary. This kind of data may be collected by creating an attitude scale about taking students to informal learning institutions and would contribute to the larger picture of science education.

CONCLUSION

This study indicates that the reasons for taking students on field trips that are identified in the literature apply in this study to field trips to the Nezahat Gökyiğit Botanic Garden. The rank order of importance of the reasons is as follows: for enjoyment; to encourage students in lifelong learning; to provide students with a general learning experience and a new experience; to enjoy the physical setting; to connect with the classroom curriculum; to enhance students' interest and motivation; to contribute to the socialization of students; to provide a change in setting or routine; and to meet school expectations. The study also emphasizes the importance of the role of the teacher in student field trips.

Participating teachers' reasons for personal visits to informal learning institutions are personal interest, learning, social event, enjoyment, place, personal development, and professional development.

There was a significant relationship between types of informal learning institutions preferred by teachers for personal visits and those selected for student field trips. Teachers organize field

trips according to their personal interests. Also, teachers who visit informal learning institutions more often organize more student field trips.

REFERENCES

Adelman, L. M., Falk, J. H., & James, S. (2000). Assessing the National Aquarium in Baltimore's impact on visitor's conservation knowledge, attitudes and behaviors. *Curator*, *43*(1), 33–62.

Anderson, D. & Zhang, Z. (2003). Teacher perceptions of field-trip planning and implementation. *Visitor Studies Today*, *6*(3), 6-11.

Anderson, D., Kisiel, J., & Storksdieck, M. (2006). Understanding teachers' perspectives on field trips: Discovering common ground in three countries. *Curator*, *49*(3), 365-86.

Crowley, K., & Callanan, M. (1998). Describing and supporting collaborative scientific thinking in parent–child interactions. *Journal of Museum Education*, *23*(1), 12–23.

DeMarco, L. W., Relf, D. & McDaniel A. (1999). Integrating gardening into the elementary school curriculum. *HortTechnology*, *9* (2), 276-281.

DeWitt, J., & Storksdieck, M. (2008). A short review of school field trips: Key findings from the past and implications for the future. *Visitor Studies*, *11*, 181–197.

Dierking, L. D., Falk, J. H., Rennie, L. J., Anderson, D. & Ellenbogen, K. (2003). Policy statement of the informal science education Ad Hoc Committee. *Journal of Research in Science Teaching*, *40* (2), 108-111.

Eshach, H. (2007). Bridging in school and out of school learning: Formal, nonformal and informal Education. *Journal of Science Education & Technology*, *16*(2), 171-190.

Falk, J. H. & Adelman, L. (2003). Investigating the impact of prior knowledge, experience and interest on aquarium visitor learning. *Journal of Research in Science Teaching*, *40*(2), 163-176.

Falk, J. H., & Balling, J. D. (1982).The field trip milieu: Learning and behavior as a function of contextual events. *Journal of Educational Research*, *76*(1), 22–28.

Falk, J. H. & Dierking, L.D. (2000). *Learning from museums: Visitor experiences and the making of meaning*. Walnut Creek, CA: Altamira.

Falk, J. H., Moussouri, T. & Coulson, D. (1998). The effect of visitors' agendas on museum learning. *Curator,* 41 (2), 106-120.

Falk, J. & Storsdieck, M. (2005). Using the Contextual Model of Learning to understand visitor learning from a Science Center Exhibition, *Science Education,* 89, 744-778.

Gay, L. R., Mills, G. E., & Airasian, P. (2006). *Educational research: Compentencies for analysis and applications* (2nd ed.), Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.

Galbraith, J. (2003). Connecting with plants: Lessons for life. *Curriculum Journal*, *62*, 82-83.

Hong, O. & Song, J. (2013) A new method of understanding learning in science centers: context diagrams of learning experiences. *Visitor Studies*, *16*:2, 181-200.

Heywood, V. H. (1991). The background for education in botanic gardens. In J. Willison & P. Wyse Jackson. (Eds.) *The First International Congress on Education in Botanic Gardens: A natural environment for learning* (pp. 16-25). UK: Botanic Gardens Conservation International.

Jarvis, P. (2002). *International dictionary of adult and continuing education*. London: Kogan Page.

Kisiel, J. (2005). Understanding elementary school teacher motivations for science field trips. *Science Education*, *89*(6), 936-955.

Kisiel, J. (2006). Making field trips work. *The Science Teacher*, *73(*1), 46-48.

Kisiel, J., & Anderson, D. (2010). The challenges of understanding science learning in informal environments. *Curator: The Museum Journal*, 53, 181–189.

Kneebone, S. (2006). A global snapshot of botanic garden education provision 2006. Retrieved from http://www.bgci.org/education/global_snapshot_edu _provis/

Kubota, C. A. & Olstad, R. G. (1991).Effects of novelty-reducing preparation on exploratory behavior and cognitive learning in a science museum setting. *Journal of Research in Science Teaching*, *28*(3), 225–234.

Liddicoat, K. R. & Krasny, M. E. (2014). Memories as useful outcomes of residential outdoor environmental education, *The Journal of Environmental Education*, *45*(3), 178-193.

McLeod, J & Kilpatrick, K. (2001). Exploring science at the museum. *Educational Leadership*, *58*(7), 59-63.

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

Morgan, S. C., Hamilton, S. L., Bentley, M. L., & Myrie, S. (2009). Environmental education in botanic gardens: Exploring Brooklyn Botanic Garden's Project Green Reach, *The Journal of Environmental Education*, *40*(4), 35-52.

Nadelson, L. S., & Jordan, J. R. (2012). Student attitudes toward and recall of outside day: An environmental science field trip. *The Journal of Educational Rese*arch, *105*, 220-231.

Osborne, J. & Dillon, J. (2007). Research on learning in informal contexts: Advancing the field? *International Journal of Science Education*, *29*(12), 1441-1445.

Phipps, M. (2010). Research trends and findings from a decade (1997–2007) of research on informal science education and free-choice science learning. *Visitor Studies*, *13*(1), 3–22.

Rogers, A. (2002). *Teaching adults (3rd ed.)*. New York: Open University Press.

Rogers, A. (2004). Looking again at non-formal and informal education - towards a new paradigm. *The Encyclopaedia of Informal Education*, Retrieved from www.infed/biblio/ non_formal_ paradigm.htm.

Schugurensky, D. (2000). The forms of informal learning: Towards a conceptualization of the field. NALL working paper 19. Retrieved from http://www.oise.utoronto.ca/depts/sese/csew /nall/res/19formsofinformal.htm.

Steward, K. (2004). What learning? What theory? In C. Hobson (Ed.), *The Fifth International Congress on Education in Botanic Gardens. Connecting with Plants: Lessons for Life* (pp. 118-124). UK: Botanic Gardens Conservation International.

Uno, G. (2009). Botanical literacy: What and how should students learn about plants? *American Journal of Botany*, *96*(10), 1753-1759.

Wellington, J. (1990). Formal and informal learning in science: The Role of the interactive science centers. *Physics Education*, *25(*5), 247-252.

Willison, J., & Green, J. (1994). *Environmental education in botanic gardens: Guidelines for developing individual strategies*. Richmond, UK: Botanic Gardens Conservation International.

Wyles, J. K., Pahl, S., White, M., Morris, S., Cracknell, D., & Thompson, R. C. (2013). Towards a marine mindset: Visiting an aquarium can improve attitudes and intentions regarding marine sustainability, *Visitor Studies*, *16*(1), 95-110.

155