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To cite this article: Armağan Ateşkan & Jennie F. Lane (2016) Promoting field trip confidence: teachers providing insights for pre-service education, European Journal of Teacher Education, 39:2, 190-201, DOI: [10.1080/02619768.2015.1113252](https://doi.org/10.1080/02619768.2015.1113252)

To link to this article: <https://doi.org/10.1080/02619768.2015.1113252>



Published online: 20 Jan 2016.



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Promoting field trip confidence: teachers providing insights for pre-service education

Armağan Ateşkan and Jennie F. Lane

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ABSTRACT

Pre-service teachers need experiences in practical matters as a part of field trip preparations programmes. For 14 years, a private, non-profit university in Turkey has involved pre-service teachers in field trip planning, implementation and evaluation. A programme assessment was conducted through a case study to examine the long-term effects of pre-service field trip preparation. Through a survey created for the study, teachers shared their field trip activities and reported confidence levels. The survey was administered to 44 alumni of the biology education department with a response rate of 72.7% ($N = 32$). This study will help researchers learn which programme areas need to be improved and can serve as a model for other institutions interested in evaluating field trip preparation programmes.

KEYWORDS

Field trips; pre-service; teacher education; confidence

Introduction and background

Biology is the study of life and field trips provide students with opportunities to explore living things in the real world. In Turkey, field trips are not included in the national biology curriculum (MoNE-Ministry of National Education 2013); therefore, it is the discretion of the teacher or the science department to use this strategy to help students learn life science concepts. Furthermore, research about field trips in Turkey is limited; it is unknown how effective field trips are or even how frequently they occur. Worldwide, there has been little research into the long-term effects of field trip preparation.

The authors of this paper work in the biology teacher education department at a private, non-profit university in Turkey. Field trip education has been included in their teaching methods classes since the department was created in 2000. Teacher education at this institution is a graduate programme. The student teachers practice-teach at partner schools around the city, three of which are located on the university campus. When the teacher education programme started in 2000, field trip preparation was part of biology education but was taught through readings and discussions. In 2003, the lead author of the paper received a request from a partner school to help conduct a trip to a local lake. Recognising this as a

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This article was originally published with error. This version has been corrected. Please see Erratum (<http://dx.doi.org/10.1080/02619768.2016.1168059>).

good opportunity for her students and the partner school, she incorporated the trip into the teaching methods class. The trip consisted of students going to three stations around the lake and participating in an investigation led by one or two pre-service teachers. There was a macroinvertebrate collection and identification station; a plant population quadrat study station; and an insect collection and identification activity station. To prepare for the trip, she visited the lake, received permission from the city to conduct the trip and arranged travel. Later, she went on a preparatory trip with the student teachers to finalise the working stations. In addition to conducting the lessons, the pre-service teachers were responsible for designing and evaluating worksheets for high school students. As the programme evolved, the student teachers became more involved in designing field trip planning, implementation and evaluation activities.

In 2009, a new instructor in the department added a more extensive trip to the biology teacher education programme. The pre-service teachers had an opportunity to travel with high school students for a five-day trip to a city in Southern Turkey. During the trip, students took a boat ride on a river that went through a salt marsh and emptied into the sea. Along the way, they investigated water quality at different sites, comparing salinity levels, dissolved oxygen, nitrogen and other factors. They estimated crab populations through capture-recapture techniques, used quadrat studies to evaluate the biodiversity of a salt marsh area, and assisted volunteers protecting the nests of *Caretta caretta*. The instructor adapted the programme she used when she was a high school biology teacher; thus, the objective was for pre-service teachers to learn field study techniques rather than field trip teaching skills. Nonetheless, student teachers were able to experience outdoor class management strategies during the trip.

Now that there are over 50 students who have graduated from the department and are practicing teachers in Turkey, the authors were curious about the long-term effects of these efforts. How many of our graduates were actually taking students on field trips? Furthermore, we wanted to determine to what extent the preparation supported field trip confidence. We decided to conduct a case study (Yin 2003) of our alumni to ascertain perceptions of their pre-service field trip preparation. Our project used survey research and descriptive statistics to gain insights into the study population. The survey was designed to give teachers an opportunity to report confidence levels regarding planning, conducting and evaluating field trips. The instrument has items for teachers to indicate the extent to which they credit their pre-service teacher education for supporting their confidence levels.

Research on field trips and teacher preparation

Benefits and challenges of field trips for teachers

Numerous studies have advocated field trips (Ballantyne and Packer 2006; Dierking and Falk 1997; Knapp and Barrie 2005; Osborne and Dillon 2007). Learning in natural settings sparks students' interests, provides them with hands-on experiences and makes learning more meaningful (Farmer, Knapp, and Benton 2007a).

There have also been investigations into the challenges of field trips (Kisiel 2006; Mitchie 1998; Muse, Chaiarelott, and Davidman 1982; Orion and Hofstein 1994). These include finding time, arranging transportation, securing funding, relating the trip to the curriculum and

maintaining safety. Among the strategies for overcoming barriers, teacher preparation is emphasised (Behrendt and Franklin 2008).

Teacher responsibilities in preparing for field trips have been investigated by several researchers (Anderson, Kisiel, and Storksdieck 2006; Tal and Steiner 2006). DeWitt and Storksdieck (2008) summarised teachers' field trip roles as follows:

- (a) become familiar with the setting before the trip; (b) orient students to the setting and agenda and clarify learning objectives; (c) plan pre-visit activities aligned with curriculum goals; (d) allow students time to explore and discover during the visit; (e) plan activities that support the curriculum and also take advantage of the uniqueness of the setting; and (f) plan and conduct post-visit classroom activities to reinforce the school field trip experience and to allow students opportunities for sharing and feedback. (187)

Unfortunately, some researchers have found that teachers are not prepared (or perceive they are not prepared) for taking students on field trips (Cox-Petersen and Pfaffinger 1998; Kisiel 2005; Mitchie 1998). Simmons (1998) conducted a factor analysis of a pictorial survey to elicit teachers' need perceptions. The study identified six factors: Appropriateness of Teaching Setting, Teacher Confidence, Worries, Need for Training, Hazards and Difficulty of Teaching Environmental Education. The Need for Training in particular addresses other barriers such as confidence and worry. Using a mixed-method study, Anderson and Zhang (2003) investigated factors influencing the decisions of elementary and middle school teachers regarding field trips. The researchers noted that although relevance to the curriculum was a key factor teachers considered when deciding on a field trip venue, there was little evidence that they incorporated learning experiences into the curriculum. This indicates that pre- and post-trip resources are important and teachers need more support to implement such resources to make field trips more effective.

Pre-service teacher field trip preparation programmes

Many institutions of higher education have begun incorporating field trip teaching strategies into their teaching methods classes (Anderson, Kisiel, and Storksdieck 2006; DeWitt and Storksdieck 2008; Kisiel 2007; Olson, Cox-Petersen, and McComas 2001). Olson, Cox-Petersen, and McComas (2001) note that classes in teacher education programmes still predominantly focus on formal, in-class settings with limited outdoor education, including field trips. They recommend that the field trip process be modelled for student-teachers and that field trip research be included in the course, emphasising that this is most important for pre-service teachers who may not have the experience or confidence to manage student behaviours. When they conducted a survey of their undergraduates about the field trip experience, most of the respondents (81%) said that 'taking the students on a trip during teaching was instrumental in their understanding of field trips' (166). The undergraduates reported that because of the experience, they would more likely take their own students on a field trip when they become teachers.

The teacher education programme at the University of British Columbia began a practicum programme for pre-service teachers in 2005. Anderson, Lawson, and Mayer-Smith (2006) conducted a qualitative case study to examine changes in students' field trip perceptions as a result of their participation. Students reported they felt more empowered to incorporate non-formal teaching environments into their lessons. The researchers' main message was

that the experience made the students better teachers as a whole, as they gained a better understanding of teaching epistemologies and pedagogies.

Tal (2001) incorporated systems thinking aspects along with learning environments research to create a framework for analysing teacher perceptions. A unique aspect of this study was that it investigated perceptions of pre-service teachers as well as in-service teachers who were participating collaboratively. The programme involved a one-day excursion, and while students and teachers valued the experience, the pre-service and less experienced teachers reported that they were still uncomfortable conducting a field trip. The study concluded that helping teachers feel more confident and positive about field trips 'can be achieved through more intensive pre-service and in-service experiences in field trips' (45).

Bozdoğan (2012) concluded through an extensive literature review of field trip research that pre-service teacher field trip preparation is important. His study focused on 17 pre-service science teachers enrolled in a course titled, 'Science Teaching in Informal Learning Environments'. Through observations and interviews, he learned that before the course students thought the main purpose of field trips was entertainment, and after the programme they realised the educational value of the trips. Another important conclusion was that helping to organise the trips increased pre-service teachers' self-confidence.

Field trip confidence and long-term effects

The term confidence was mentioned in the two preceding studies and has been investigated in other research as well. Teachers need confidence to plan and conduct field trips. Without this confidence, it is unlikely that field trips will occur. In his study, Kisiel (2007) recognises the need for building what he calls 'museum efficacy' which he equates with the concept of confidence. A leading expert on self-efficacy, Bandura (1997) points out that efficacy and confidence have different meanings. With self-efficacy the emphasis is on the belief that one's abilities or efforts will produce the desired outcomes. Confidence is a 'catchword rather than a construct embedded in a theoretical system' (382). However, Lindemann-Matthies et al. (2011) explain in their study, 'the term "confidence" refers to the confidence ... to perform specific tasks and is thus used more in the sense of self-efficacy than in its colloquial meaning' (2251). The self-efficacy of teachers regarding their field trip actions is extremely important; nonetheless, teacher confidence is a first and crucial step for field trips.

What contributes to teacher confidence for conducting field trips? Mitchie (1998) suggests facilitating meetings between students and local experts who work in the community or the field. Kisiel (2013) arranged for this interaction as part of students' pre-service methods class. In one class assignment, students participated in a community event or programme. He found that pre-service teachers' conceptions of the role of non-formal institutions for education (as a resource) changed after students became involved in their programmes. Despite these positive outcomes, he wondered about their long-term effects:

Probably more critical than the question of attributing perspective changes is the question of long-term impacts. To what extent would such changes in perspective be sustained through the important induction phase of teacher development continuum? (86)

This question leads to another investigative need for field trip research. While field trip preparation can be integrated into teacher education programmes, how persistent are the effects of pre-service field trip preparation? Although investigation into the long-term effects of field trips has been limited (Farmer, Knapp, and Benton 2007b), there have been

some studies that have examined retentive aspects of teacher education. Moseley, Reinke, and Bookout (2002) investigated the self-efficacy of pre-service teachers following a three-day outdoor environmental education experience. What is notable about this study is that while the survey results revealed expected high self-efficacy levels immediately after the experience, the teachers' self-perceptions dropped when they were surveyed seven weeks later. The researchers' assumption is that as students become more knowledgeable about all the expectations of teachers, their overall confidence levels decline. Their study concludes with the recommendation for 'longitudinal studies of the environmental education teaching efficacy beliefs as pre-service teachers move from novice to experienced teachers' (14). Tal (2001) reports professional development can increase comfort levels, but the training must be suitable to teachers' needs and experiences. Tal suggests offering 'teachers a variety of experiences, which will increase their self-confidence and ability to facilitate field trips as an ongoing and enriching science learning environment' (46). It will be important to ascertain which aspects of field trip preparation need continued support and which ones are long-lasting. In response to the need to better understand long-term effects of field trip preparation, the current study examines practicing teacher perceptions of their pre-service teaching experiences. In particular, the study aims to identify which aspects of pre-service teacher preparation best support field trip confidence.

Purpose of the study

This study aims to gain insights into teachers' perceptions of their pre-service programme regarding field trip preparation. The population for this study was biology teachers who graduated from a private non-profit university in Ankara, Turkey. A complementary purpose of the study is to learn which aspects of the programme are supportive of teachers and which areas need to be improved. The results can help teacher education institutions better design their pre-service field trip preparation programmes.

Methods

Participants

For this study, we used convenience and criterion strategies for purposive sampling (Fraenkel and Wallen 2003; Patton 2002). To be included in the sample, the participant needed to be a graduate of our teacher education programme and be teaching biology in Turkey. Of the 71 students who graduated before 2013, 44 met the inclusion criteria. The survey was administered to all 44 teachers online via email and reminders were posted via Facebook. The response rate was 72.7% ($N = 32$), of whom 29 were female. The respondents are working in various regions of Turkey.

Research Instrument

We created a survey to give teachers an opportunity to report confidence levels regarding planning, conducting and evaluating field trips. Based on our personal field trip experiences and after a review of the literature, we identified key steps of field trip planning and implementation. The literature review confirmed aspects of field trips teachers find most challenging. This information was used to design items regarding teacher confidence and field trips.

Table 1. Breakdown of respondents based on graduation year and field trip preparation experience.

Teaching certificate awarded	Field trip preparation of the graduate teacher education programme	Number of graduates	
		Conduct field trips	Do not conduct
2000–2002	Field trip preparation in classroom only	–	1
2003–2007	Field trip to local lake	6	1
2008–2013	Field trip to local lake and to southern Turkey	18	6

The instrument was composed of three sections. The first section included eight items to obtain information about the respondents' school and their teaching experience. The 14 items in the second section asked if and how the teachers' biology department conducted field trips. These items included ranking questions where teachers were asked to identify top challenges to and benefits of conducting field trips. The second section also contained a Likert scale question ranging from Very confident to Not confident where teachers reported their current confidence levels regarding various aspects of conducting a field trip. The third section comprised 11 items in which respondents provided information about their pre-service field trip preparation. The aspects of conducting a field trip were repeated in this section, except teachers reported to what extent their pre-service experience involved them in the activity. Their options were Very involved, Somewhat involved, Not very involved and Not included. They were also given an 'I don't know' option. This section also included Likert-type questions where teachers could indicate the extent to which they credit their pre-service preparation for the quantity and quality of their field trips as well as their confidence levels for planning and conducting field trips.

The instrument was originally written in English and then translated into Turkish. After drafting the instrument, an expert in survey design reviewed it to check for bias and ambiguity. We piloted the survey with three alumni to examine construct validity. In this study, the reliability check with Cronbach's alpha resulted in the score of .937 ($N = 32$). The survey was created using a Google Docs form and administered via email.

Data analysis

The survey was completed in April 2014 and initial analysis began in May. The primary analysis involves a review of the frequencies and means. Pearson r Correlation Statistical Package for Social Science (PASW-SPSS) software version 20 was used for finding correlation of age and confidence, and the amount of experience and confidence.

Results

Of the 32 teachers who responded, 24 (75%) reported they take students on field trips (Table 1). The respondents were divided into three groups based on the type of field trip preparation they received during their pre-service teacher education (i.e., field trip preparation in the classroom only; lake field trip only; and both lake and salt marsh field trip – see Introduction and Background for more information).

Field trip challenges and motivations

All respondents, irrespective of whether they reported taking students on trips, provided information about field trip confidence, benefits and challenges. Regarding challenges, participants were given a list and asked to select the top three. As found in the literature, the respondents indicated that the top challenges were time ($n = 26$) and student safety ($n = 12$). They also listed concerns about health (allergies), limited student interest and lack of administrative support. When provided with a list of reasons for conducting field trips and asked to select their top three choices, the most popular responses were to increase student interest in science ($n = 26$), to help students understand concepts that are better taught outside the classroom ($n = 29$) and to foster respect for nature ($n = 15$). Student enjoyment ($n = 8$) and entertainment ($n = 8$) were the least popular choices.

Field trip activities

For the teachers who indicated their department does take students on field trips, nine reported that they are always the trip leader and one stated that s/he has been exclusively a co-leader. The rest of the teachers ($n = 14$; 58%) indicated that they have been both trip leaders and co-leaders. There were five (21%) who said they took trips more than their colleagues. In the survey, teachers were asked where the trips take place (to check all that apply, therefore $n > 24$). Most respondents indicated that they took trips within the community ($n = 19$, 41%), and some reported they also took students to other places in the country ($n = 16$, 35%). One teacher reported taking students on an international trip. The survey invited teachers to describe their trips. Similar to their pre-service experiences, teachers took students to nearby lakes where they conducted activities such as macroinvertebrate identification, water analysis and plant biodiversity assessment. One teacher has a partner school in Sweden that conducts lake studies as well; through Skype, students from both countries compare results. The teachers listed other trips including visits to zoos to study endangered species, to a hospital to observe a brain operation and to the Atomic Energy Centre to learn about nuclear energy and radiation.

Field trip confidence

Teacher confidence level was high for all aspects of the programming except involving parents or guardians in the trip (see Figure 1). Other areas in which most teachers were very or somewhat confident included networking, fundraising and obtaining equipment. When asked to what extent their pre-service experience influenced their field trip activities and confidence, of the 24 teachers who take students on field trips, 14 (58%) indicated that their pre-service experience has influenced the *quantity* of field trips they take to a great extent. There were 16 (67%) who credited their pre-service preparation to a large extent for the *quality* of their trips. Regarding confidence levels for *planning* and *conducting* trips, 17 of the 24 teachers (71%) credited their pre-service preparation to a large extent. It is notable that of the eight teachers who indicated their department does not take students on field trips, six still credited their pre-service preparation for their confidence levels in all areas (quantity, quality, planning and conducting). A correlational analysis found no significant relationship

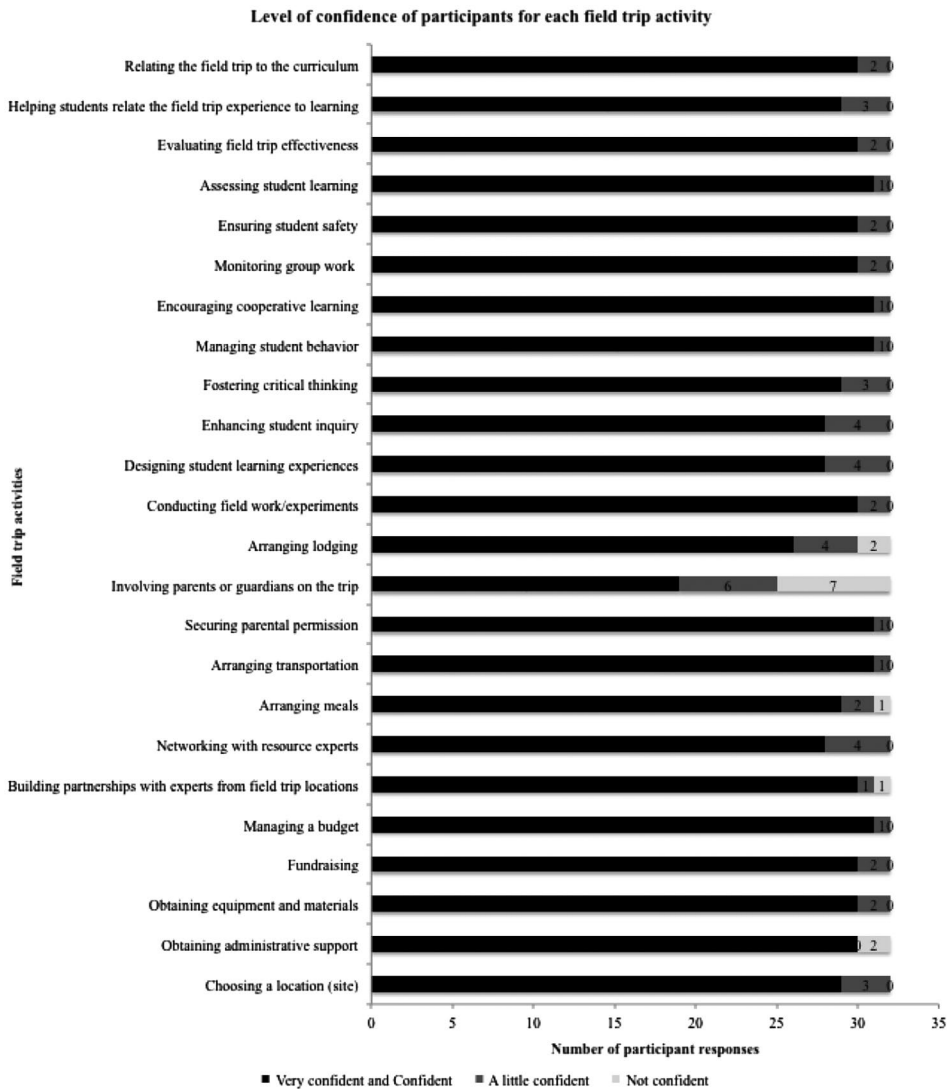


Figure 1. Level of confidence of participants for each field trip activity.

between age and confidence ($r = .140, p > .05$), nor between the amount of experience and confidence ($r = .317, p > .05$).

To gain further insights into teacher perceptions of their pre-service field trip preparation, we gave the respondents the list of field trip activities again and asked all of them, whether or not they currently conduct field trips, to indicate the extent to which they were involved in these activities during their pre-service education. These results revealed that teaching techniques related to field studies were assimilated by the teachers, but many of the field trip logistics were not (Figure 2). They graduated from our programme with understandings of how to relate field trips to the curriculum and to use field studies to foster critical thinking; however, the preparation experience did not educate them about managing a budget, arranging meals and transportation or building partnerships with non-formal education sites.

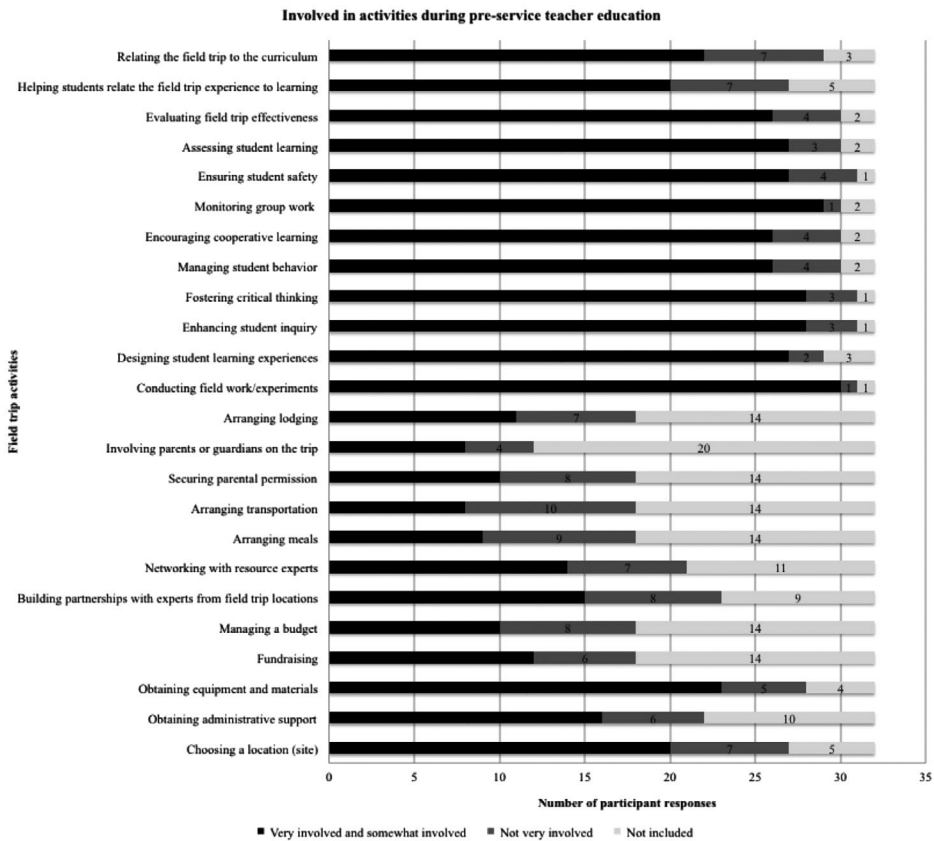


Figure 2. Involvement of participants in field trip activities during their pre-service education.

In one of the final questions, respondents were asked to what extent they agreed that integration of field trip preparation into pre-service education was important, and they all agreed. All of the respondents either strongly agreed or agreed that they would be interested in participating in an in-service programme on field trips. The teachers were provided space to share comments (Note: comments were in Turkish and translated for this paper). One noted that 'I don't have a hard time organising field trips. During my pre-service teacher education, I took part in a field trip with high school students. That's why I believe that field trip training should be a part of teacher education programmes'.

Limitations

This investigation was a case study involving alumni from one private, non-profit university in central Turkey. Along the lines of an intrinsic case study (Stake 1995), the research intended to help us better understand our study population. Since this was a study where we were intrinsically looking at *our* case, one limitation is the 'generalizability' of the study. Nevertheless, we hope our study will encourage other teacher education programmes to survey their alumni to improve field trip preparation. That being said, our main aim was to examine our case, our programme. Consequently, the population was purposively sampled

and the respondents were aware of who sent the survey and why. There is the chance, therefore, that an assortment of biases, such as 'desire to please', could affect the results (Dillman, Smyth, and Christian 2008). We used the pilot, content review and statistical analysis to make the survey as neutral as possible. We sought to make the teachers stakeholders in the research, requesting that they provide candid and truthful insights into their experiences. We were not looking for praise or acclaim from the alumni; we wanted to learn from them how we can improve the programme to better prepare teachers for field trips. And indeed, we were made aware of important components of our methods course that need improvement.

Discussion and conclusions

This study arose from our interest to learn the effectiveness of our efforts to prepare teachers to conduct field trips. Researchers in field trip studies have recommended that long-term effects of teacher education should be investigated (Kisiel 2013; Tal 2001). We heard anecdotally from our graduates that rather than simply participating in the field trip, they needed to take an active part in the planning and implementation. One of the alumni stated that, 'student-teachers could be included more into administrative jobs and logistics. We could be more involved during the arrangements of transportation, lodging, and getting into touch with the administration at the field trip site'. There are several field trip preparation activities in which our alumni indicated they were not involved during their pre-service experience. Which of these should and can be integrated into pre-service teacher education programmes? Currently, we arrange the transportation, meals, and field trip location. We do this because working within the university, we are proficient in making these arrangements. Perhaps we can transfer some of these tasks to our students or create simpler trips that are more feasible for them to organise. In 2012, we adjusted our programme to give more of the teaching responsibility to the pre-service teachers by assigning them to high school students to mentor throughout the field trip. This year, our students are conducting place-based education activities as a means to experience some aspects of field trip planning. They will focus on the activities in which our alumni indicate they still lack confidence, such as involving parents, obtaining equipment and fundraising. We will also examine strategies to provide continued support to our alumni throughout their career, such as creating a network between our teachers and resource experts (Mitchie 1998).

Overall, it appears that our alumni credit their confidence levels to their pre-service experience; however, they also reported that many aspects of trip planning logistics were not included in their training. If they did not learn these field trip aspects in their pre-service preparation, when and how did they learn them? We will continue to investigate the perceptions and practices of our alumni and confer with other researchers for the purpose of contributing to the development of effective field trip preparation. We anticipate follow-up interviews and administering the survey on a broader scale, including teachers who graduated from other institutions in Turkey. As part of this effort, we will further examine the validity and reliability of our instrument and make it available as a tool other teacher education programmes can use to evaluate their field trip preparation efforts. With these contributions, we hope more teachers will take students outdoors, to museums and within their community to learn from the real world and from real experiences.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

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References

- Anderson, D., J. Kisiel, and M. Storksdieck. 2006. "Understanding Teachers' Perspectives on Field Trips: Discovering Common Ground in Three Countries." *Curator: The Museum Journal* 49(3): 365–386.
- Anderson, D., B. Lawson, and J. Mayer-Smith. 2006. "Investigating the Impact of a Practicum Experience in an Aquarium on Pre-Service Teachers." *Teaching Education* 17 (4): 341–353. doi:10.1080/10476210601017527.
- Anderson, D., and Z. Zhang. 2003. "Teacher Perceptions of Field-trip Planning and Implementation." *Visitor Studies Today* 6 (3): 6–11.
- Ballantyne, R., and J. Packer. 2006. "Promoting Learning for Sustainability: Principals' Perceptions of the Role of Outdoor and Environmental Education Centers." *Australian Journal of Environmental Education* 22 (1): 15–30.
- Bandura, A. 1997. *Self-Efficacy: The Exercise of Control*. New York: W.H. Freeman.
- Behrendt, M., and T. Franklin. 2008. "A Review of Research on School Field Trips and Their Value in Education." *International Journal of Environmental & Science Education* 9 (3): 235–245.
- Bozdoğan, A. 2012. "The Practice of Prospective Science Teachers regarding the Planning of Education Based Trips: Evaluation of Six Different Field Trips." *Educational Sciences: Theory & Practice* 12 (2): 1062–1069.
- Cox-Petersen, A., and J. Pfaffinger. 1998. "Teacher Preparation and Teacher-Student Interactions at a Discovery Center of Natural History." *Journal of Elementary Science Education* 10 (2): 20–35.
- DeWitt, J., and M. Storksdieck. 2008. "A Short Review of School Field Trips: Key Findings from the past and Implications for the Future." *Visitor Studies* 11 (2): 181–197. doi:10.1080/10645570802355562.
- Dierking, L., and J. Falk. 1997. "School Fieldtrips: Assessing Their Long-term Impact." *Curator* 40: 211–218.
- Dillman, D., J. Smyth, and L. Christian. 2008. *Internet, Mail, and Mixed-mode Surveys: The Tailored Design Method*. Hoboken, NJ: John Wiley & Sons.
- Farmer, J., D. Knapp, and G. Benton. 2007a. "The Effects of Primary Sources and Field Trip Experience on the Knowledge Retention of Multicultural Content." *Multicultural Education* 14 (3): 27–31.
- Farmer, J., D. Knapp, and G. Benton. 2007b. "An Elementary School Environmental Education Field Trip: Long-Term Effects on Ecological and Environmental Knowledge and Attitude Development." *The Journal of Environmental Education* 38 (3): 33–42.
- Fraenkel, J., and N. Wallen. 2003. *How to Design and Evaluate Research in Education*. New York: McGraw-Hill.
- Kisiel, J. 2005. "Understanding Elementary Teacher Motivations for Science Fieldtrips." *Science Education* 89 (6): 936–955.

- Kisiel, J. 2006. "Making Field Trips Work." *Science Teacher* 73 (1): 46–48.
- Kisiel, J. 2007. "Examining Teacher Choices for Science Museum Worksheets." *Journal of Science Teacher Education* 18 (1): 29–43.
- Kisiel, J. 2013. "Introducing Future Teachers to Science beyond the Classroom." *Journal of Science Teacher Education* 24 (1): 67–91.
- Knapp, D., and E. Barrie. 2005. "Content Evaluation of an Environmental Science Field Trip." *Journal of Science Education and Technology* 10 (4): 351–357.
- Lindemann-Matthies, P., C. Constantinou, H. Lehnert, U. Nagel, G. Raper, and C. Kadji-Beltran. 2011. "Confidence and Perceived Competence of Preservice Teachers to Implement Biodiversity Education in Primary Schools – Four Comparative Case Studies from Europe." *International Journal of Science Education* 33 (16): 2247–2273.
- Mitchie, M. 1998. "Factors Influencing Secondary Science Teachers to Organise and Conduct Field Trips." *Australian Science Teacher's Journal* 44: 43–50.
- MoNE-Ministry of National Education. 2013. *Secondary School Biology (9. 10. 11 and 12th Grades) Curriculum*, Ankara: MoNE.
- Moseley, C., K. Reinke, and V. Bookout. 2002. "The Effect of Teaching Outdoor Environmental Education on Preservice Teachers' Attitudes toward Self-efficacy and Outcome Expectancy." *The Journal of Environmental Education* 34 (1): 9–15. doi:10.1080/00958960209603476.
- Muse, C., L. Chaiarelott, and L. Davidman. 1982. "Teachers' Utilization of Field Trips: Prospects and Problems." *Clearinghouse* 56 (3): 122–126.
- Olson, J., A. Cox-Petersen, and W. McComas. 2001. "The Inclusion of Informal Environments in Science Teacher Preparation." *Journal of Science Teacher Education* 12 (3): 155–173.
- Orion, N., and A. Hofstein. 1994. "Factors That Influence Learning during a Scientific Field Trip in a Natural Environment." *Journal of Research in Science Teaching* 31 (10): 1097–1119.
- Osborne, J., and J. Dillon. 2007. "Research on Learning in Informal Contexts: Advancing the Field." *International Journal of Science Education* 29 (12): 1441–1445.
- Patton, M. 2002. *Qualitative Research and Evaluation Methods*. 3rd ed. Thousand Oaks, CA: Sage.
- Simmons, D. 1998. "Using Natural Settings for Environmental Education: Perceived Benefits and Barriers." *The Journal of Environmental Education* 29 (3): 23–31. doi:10.1080/00958969809599115.
- Stake, R. 1995. *The Art of Case Study Research*. Thousand Oaks, CA: Sage.
- Tal, R. 2001. "Incorporating Field Trips as Science Learning Environment Enrichment – An Interpretive Study." *Learning Environments Research* 4 (1): 25–49.
- Tal, R., and L. Steiner. 2006. "Patterns of Teacher-Museum Staff Relationships: School Visits to the Educational Centre of a Science Museum." *Canadian Journal of Math, Science & Technology Education* 6 (1): 25–46.
- Yin, R. 2003. *Case Study Research: Design and Methods*. 3rd ed. Thousand Oaks, CA: Sage.