



Turkish teachers' use of the outdoors as a teaching resource: Perceived facilitators and obstacles

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ABSTRACT

Several studies have investigated teachers' use of local environments. There has been limited research in Turkey about teacher perceptions of facilitators and obstacles. The current study received permission to use a survey conducted in the United States and to administer it to alumni of a teacher education program in Turkey. Compared to other studies, respondents to the current study reported that openness to teaching different teaching methods was a notable perceived facilitator for place-based education. This finding and others will be used by the teacher education program to improve place-based education in their methods courses.

Introduction

In many school systems and educational programs, there is interest in using place-based education (PBE) to promote environmental education. This approach involves using local environments, such as the school grounds and community sites, as resources to teach students about various concepts and topics. Place-based education is rooted in natural and human-built aspects of the students' local environment (Sobel, 2004). Smith (2007) notes that PBE fosters “a sense of affiliation with the places where they live” (p. 192). Like environmental education, place-based education applies to many different subject areas. For example, art teachers can have students use plant materials to create sculptures and students can use skills in mathematics to measure height, widths, and populations of trees in a nearby forest. Compared to extensive field trips, place-based education can be accomplished by simply stepping outside the school door and going to the playground. Despite this apparent ease, researchers have found teachers still report barriers to implementing PBE (Ernst, 2009; Simmons, 1998).

The researchers of the current study wanted to investigate if similar barriers and facilitators were perceived by Turkish teachers. The authors of this article work in a

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biology teacher education department within a private university in central Turkey. While they have integrated place-based education into their science courses, they appreciate that approach is interdisciplinary and is suitable for other programs in the department. As noted by Ardoin (2006), it is important to appreciate the multifaceted and integrated concepts associated with place. “A sense of place incorporates psychological being, social community, cultural symbols, biophysical territory, and political and economic systems” (p. 121). Therefore, an ancillary component of the study was to learn if graduates from other disciplines in their program (mathematics, English, computer technology, or Turkish language and literature) report using PBE.

Research questions

The goal of the researchers was to investigate ways to improve place-based education in their teacher education program. Prior to developing strategies to integrate utilization of local resources into the methods classes and other courses, there was a need to understand perceived barriers and facilitators of place-based education. The study involved surveying graduates of their teacher education program. To guide the study, the following research questions were posed:

- What do teachers perceive influencing them to include PBE in their teaching?
- What are perceived obstacles that prevent teachers from including PBE in their teaching?
- Do science teachers tend to use PBE more than other subject areas?

Examples of using PBE and local environments as teaching resources

Researchers in environmental education have found many benefits to PBE and using local environments as a teaching resource (Blatt & Patrick, 2014; Marcouyeux & Fleury-Bahi, 2010; Meichtry & Smith, 2007). These include increasing subject area knowledge, fostering connections with nature, promoting physical health, and developing personal relationships.

Regarding subject area knowledge, Milner, Sondergeld, and Rop (2015) used place-based strategies to promote teachers’ understanding of nature of science. They noted in their study, that the teachers who enrolled in their program already had a strong understanding of how science happens, but their precourse analysis identified some of what they called naïve conceptions (less accurate understandings of the process of scientific discovery). They were hoping that involving teachers in place-based scientific inquiry activities would advance their understandings. Although they did find some changes, they acknowledged teachers retained some of misunderstandings of the nature of science. In another study, Gautreau and Binns (2012) conducted action research to investigate the effects of an inquiry place-based curriculum on students’ academic achievements in science. Although they were disappointed that there were no significant changes in test scores, ecological awareness did improve among the student population.

Connections with nature have been the focus of some PBE research studies. Cincera, Johnson, and Kovacikova (2015) sought to increase appreciation of a natural park area in the Czech Republic. They had some disappointing results, in that student attraction (e.g., their inclination to use the site for exercise and leisure) to the area did not change. However, they did learn that students' sense of attachment to their own communities did improve. Likewise, Semken and Freeman (2008) developed a place-based geology course and found significant changes in students' sense of place.

The importance of providing students with areas for outdoor play was presented in a study by Ozdemir and Yilmaz (2008). They examined use of outdoor sites by students in five primary schools in Ankara. After a review of the quality of the outdoor sites, student behaviors, and students' body mass index, they found notable connections between student physical health and access to schoolyard areas. They recommended that schools focus on improving their school grounds to provide students with adequate areas to exercise and enjoy being in the outdoors.

PBE has been found to enhance connections with the local community (personal relationships). Cook and Buck (2014) used local resources to involve preservice teachers in a community of practice study. They connected preservice teachers with local scientists to provide them with opportunities to engage in scientific inquiry. In this case, the "place" was the local community. Another aspect using PBE for personal relationships is community involvement. Zachariou and Symeou (2009) researched the outcomes of a program designed to involve teachers in their local community. They found that the activities empowered students to get involved and addressed many of the needs of education for sustainable development.

Given these benefits, there has been a call for increasing the amount of PBE in schools (Gruenewald, 2005; Miles, 2008; Smith, 2007). With the efforts to increase PBE in schools, there is also the need to evaluate the effectiveness of PBE implementation. Powers (2004) noted that research in this area is slim. Her study discussed the creation of the Place-based Education Evaluation Collaborative (PEEC) that sought to evaluate PBE professional development programs. Her team evaluated four programs and identified strengths and areas for improvement. Notably, they found that the programs did have positive effects on teacher use of local places and interdisciplinary teaching. Teachers also collaborated more and developed their curriculum planning skills. The study did identify challenges faced by the programs, including time and addressing the learning of special needs students. Their recommendations included improving communication within their programs and collaborating more with community partners. PEEC plans to continue to develop its program evaluation measures and to work with more organizations to help advance PBE in schools. It is apparent in their findings that it is critical to understand teachers' attitudes and understandings of PBE to make the approach effective.

Ernst (2007, 2009) has conducted several studies to investigate factors that influence and discourage teachers' use of outdoor settings. She uses the term

environment-based education (EBE) rather than PBE; however, the approaches are similar (e.g., interdisciplinary, use of local environments, student-centered). In one study, Ernst (2007) reviewed the literature to identify frequently mentioned barriers and influences to use of EBE and created a questionnaire using these factors. She administered the survey to 287 teachers and received 200 responses (70% response rate). Through an analysis of variance and discriminant function analyses, she identified that state testing, funding, time, and transportation were the most notable barriers. She also learned that sensitivity about the environment and environmental literacy were the strongest perceived influences for teachers to use EBE. In a later study, Ernst (2009) used a slightly different lens to examine teachers' use of EBE. She identified and acknowledged barriers and was looking more into how and why teachers overcome these challenges. This study was a second phase of her earlier study and involved a random selection of 1,000 middle school teachers nationwide. She had a lower response rate for this study (20%), but was able to discern useful information regarding determining factors related to teacher use or nonuse of EBE. It appears that teachers will be influenced to use environment-based education if they see evidence of positive student learning outcomes. One of the key barriers the teachers identified was lack of training.

There have been a few investigations into PBE in Turkey (e.g., Kasalı & Doğan, 2010; Köşker & Karabağ, 2012; Ürey & Çepni, 2014); nonetheless, more focus on teacher perceptions of PBE is needed. This study sought to learn if graduates of a teacher education program in Turkey were using PBE and to identify perceived influences and barriers for using local environments during their instruction.

Methods

Participants

This study targeted graduates of a teacher education program in Turkey who were teaching within the country. Of the 290 students who graduated before 2014, 153 met the inclusion criteria. The survey was announced to all 153 teachers through e-mail and an alumni Facebook group page. One of the intentions of this study was to learn to what extent nonscience teachers use PBE. Therefore, all the alumni who have graduated were considered. The response rate was 45.7% ($N = 70$).

The subject areas that the participants teach were as follows: Science ($n = 26$), mathematics ($n = 18$), English language and literature ($n = 10$), Turkish language and literature ($n = 8$), social sciences ($n = 1$), computer and instructional technologies ($n = 6$), and other areas ($n = 1$).

Of the 70 participants, 59 were women and 11 were men. There are 44 (63%) alumni who have been teaching for 1 to 5 years, 19 (27%) for 6 to 10 years, and the rest ($n = 7$; 10%) for 11 to 20 years. The majority of the participants ($n = 68$; 97.1%) have been teaching in private schools and two of them have been teaching in state schools. Most of the alumni work in urban settings ($n = 60$) and six in rural areas

and four in suburban settings. The majority of the participants ($n = 50$) teach at a secondary level school, whereas a smaller number work at the middle school level ($n = 14$) schools and the rest ($n = 6$) work at primary schools.

Research instrument

We received permission to adapt a survey that was developed by Julie Ernst (2007) to find out teachers' experiences in what she called environment-based education. For the current study, this practice is referred to as placed-based education.

The instrument was composed of four sections. The first section included 13 items to obtain demographic information about the participants, their teaching experience, and whether they take students out of classroom. The two items in the second section asked if and how the teachers' take students outside. The third section contained 25 Likert scale question ranging from *strongly agree* to *strongly disagree* where teachers reported facilitators (i.e., high comfort level with the outdoors, the grade level they teach, adequate funding) of PBE. In addition to these questions, this section included two open-ended questions. One asked teachers to identify which of the factors were the strongest facilitators for taking students to environment. The second requested teachers to report what percent of their total teaching year is PBE or a similar outdoor education approach. In the fourth section there were 17 Likert scale questions that used the same range as the third section, but instead inquired about the barriers (i.e., concerns regarding safety, liability, and classroom management, lack of funding, lack of planning time) of environmental to outdoor education according to teachers.

The participants who received the questionnaire are fluent English speakers; therefore, the instrument was written and administered in English. The survey was created using a Google Docs form and administered via e-mail. The reliability check for Cronbach's alpha resulted in the score of .920 ($N = 70$) for facilitators and .923 ($N = 70$) for obstacles.

Data analysis

The survey was completed in June 2015 and initial analysis began in September. The analysis involved a review of the demographic information. For each item, we calculated the frequency and mean. When reporting the data for the Likert items, positive responses *strongly agree* and *agree* were combined and negative responses *strongly disagree* and *disagree* were combined.

Results

Twenty six of the teachers (37.1%) reported that they are taking their students outside to teach a lesson, while 44 of the respondents (62.9%) stated that they are not taking them outside for education. These results are more comparable to the second study Ernst (2009) conducted. In that study, she acknowledge a low response rate of 20% ($n = 190$). Of the teachers who responded, only 53 said they

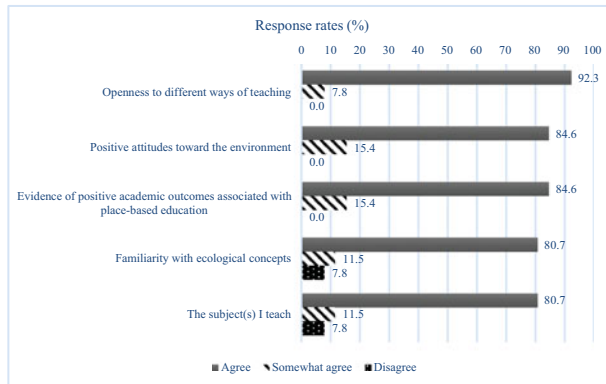


Figure 1. Perceived facilitators by teachers who use place-based education (top five responses).

used environment-based education (28%). In her first study (Ernst, 2007), she purposefully sampled teachers who use environmental education. Of those, around two thirds ($n = 130$) used some form of EBE.

In the current study, all respondents were asked about perceived barriers to PBE. Only those who reported taking students outside were asked about the factors that facilitated them to include PBE in their teaching.

Factors that teachers' perceive support PBE in their teaching

The five most frequently selected perceived facilitators are presented in Fig. 1. Of the teachers who do take their students outside, the majority ($n = 24$; 92.3%) agreed that their openness to different ways of teaching encourages them. Two other perceived supporting factors are evidence of positive academic outcomes associated with PBE (84.6%) and positive attitudes toward the environment (84.6%). The other three highly agreed facilitators reported by the teachers were the subject they teach (80.7%), their familiarity with ecological concepts (80.7%), administrative support for their environment-based approach (76.8%). The least selected facilitators were parental support (46.1%) and local community partners (50%). Frequencies of all the responses are given in Table A1 in Appendix A. In the studies Ernst (2007, 2009) conducted, she used various statistical analyses to create 11 composites. Compared to the current study, Ernst found that items related to environmental literacy and sensitivity were significant influences in her study populations. However, “receptiveness to environment-based education” was also a notable influence, and this composite included the item “openness to new ways of teaching.”

The obstacles perceived by the teachers who use PBE in their teaching

Just over half of the teachers ($n = 14$; 53.8%) who reported that they use PBE agreed that their concerns regarding safety, liability, and classroom management are obstacles for them (see Fig. 2). Slightly less than half of these teachers ($n = 12$; 46.1%) agreed with the following two obstacles: “emphasis on national testing” and “lack of

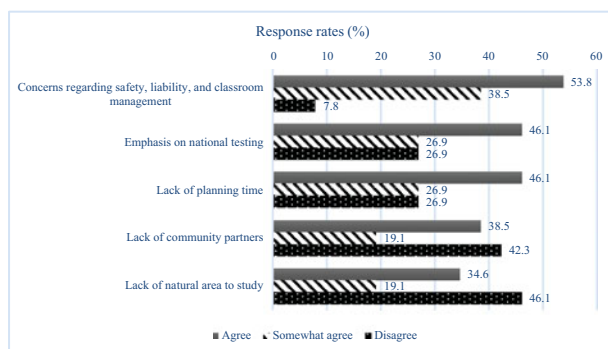


Figure 2. Perceived obstacles by teachers who use place-based education (top five responses).

planning time.” Another perceived obstacle agreed by these teachers ($n = 10$; 41%) is that they lack community partners.

It was interesting to note that they did not perceive that many of the items listed were obstacles. They disagreed (65.3%) that using PBE was against the school climate. They also disagreed (57.7%) that lack of transportation, lack of comfort being in the outdoors or the grade level they teach can be perceived as obstacles to use PBE. More than half of the teachers (53.8%) who use PBE in this study did not agree that the administrative support can be perceived as an obstacle. Half of those teachers also disagreed that lacking of procedural/pedagogical knowledge, lack of funding or lack of parental support can be considered as obstacles to use PBE. [Table A2](#) in [Appendix A](#) includes details of all the responses.

The obstacles perceived by the teachers who do not use PBE in their teaching

In her studies, Ernst (2007, 2009) found state testing and standards, funding, time, and transportation were frequently reported as barriers in her study population. Similar results were found in the current study (see [Fig. 3](#)), and other factors also ranked high (concerns regarding safety, liability, and classroom management, issues with the grade level they teach, and lack of interest or lack of convincing evidence as

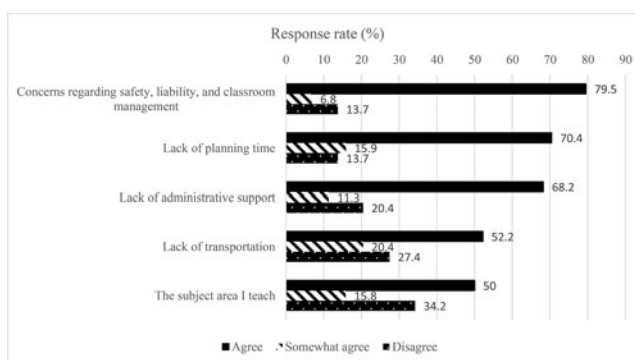


Figure 3. Perceived obstacles by teachers who do not use place-based education (top five responses).

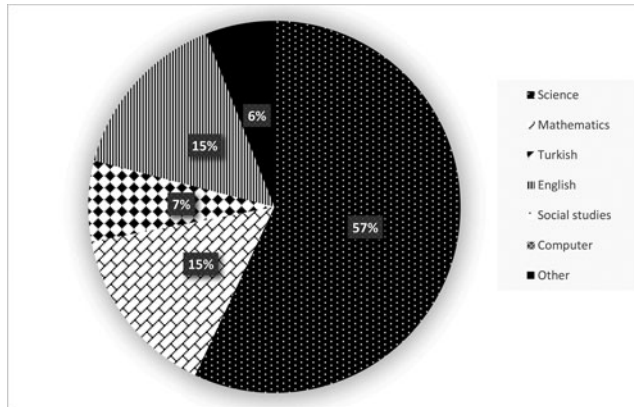


Figure 4. Percentages of subject area teachers that use place-based education.

to why they would want to use PBE). The complete list of items and their frequencies is found in [Table A3](#) in [Appendix A](#).

Although teachers who do and do not use PBE frequently identified similar barriers, there were some obstacles that were notably stronger for teachers who do not use local environments for teaching (see [Table A4](#) in [Appendix A](#)). Of the 44 teachers who do not use PBE, 30 (68.2%) agreed that lack of administrative support is one of the major obstacles for them. Other obstacles that were more noticeable for teachers who do not use PBE are lack of transportation (52.2%) and emphasis on national testing (50%). Interestingly lack of environmental content knowledge (45.5%) was not perceived to be an obstacle to use PBE. Almost half of these teachers (45.5%) agreed with the teachers who use PBE that PBE is not against their school climate.

PBE and subject areas

[Figs. 4](#) and [5](#) provide information about the percentage of teachers who do and do not use PBE based on subject area. Based on the results, the majority of the teachers who used PBE (57%) are science teachers. English and mathematics teachers are the next largest group (15%), followed by Turkish language teachers (7%). Among science teachers who responded to the survey, 57% of them use PBE and 43% do not. The majority of the mathematics teachers (78%), Turkish teachers (75%), and English teachers (60%) do not use PBE. Social studies and computer teachers are not using that approach at all.

Discussion

Not surprisingly, science teachers were the largest response group to the study's questionnaire and their population reported using PBE more than other subject areas. None of the computer teachers in this study reported using PBE. It is clear that PBE and outdoor education is still associated with science studies (Ernst, 2007; Gruenewald, 2005; Miles, 2008). It is possible that teachers may not appreciate the philosophy of PBE; they may think it must involve a field trip and

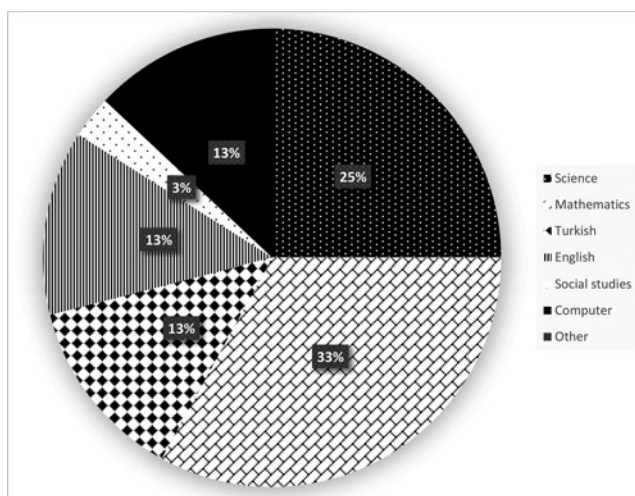


Figure 5. Percentages of subject area teachers that do not use place-based education.

travel. This assumption is based on teachers listing safety, travel, and the need for administrative support as barriers to PBE. In their study, Tan and Atencio (2016) also found Taiwanese teachers lacked an understanding of PBE pedagogy. Meichtry and Smith (2007) stress the importance of including outdoor education in preservice teacher education and providing teachers with ongoing professional development.

Therefore, one of the first steps to improving PBE in Turkey is to educate teachers about what it is and how local resources can be used to support student learning. Evidence that PBE supports student learning was among the strongest perceived facilitator for PBE, and these findings need to be shared with other teachers. With concerns about time needed to prepare students for national exams reported by PBE and non-PBE teachers alike, more studies are needed that show how student learning can be improved by making learning relevant and real using local resources. The study by Schutte, Torquati, and Beattie (2017) is an important step toward highlighting the effect of experiences in nature and learning processes. Their study focused on young children and their memory retention associated with walks in nature. They concluded that outdoor experiences helped students stay on task, and acknowledged more research is needed to learn about variables and conditions. Nonetheless, more studies such as this can help demonstrate positive contributions of outdoor learning experiences.

One of the strongest perceived facilitators of PBE found in this questionnaire was openness to different ways of teaching. These are teachers who are looking to incorporate new strategies into their lessons. In the literature, there are a number of studies that investigate teachers' openness to change and use of technology (e.g., Baylor, & Ritchie, 2002; Blau, & Peled, 2012; Tondeur, Hermans, van Braak, & Valcke, 2008), similar studies can be used to investigate strategies to improve receptiveness to using local environments as a teaching resource.

The methods classes of teacher education programs can highlight the benefits of using a diversity of teaching strategies, including PBE (Fägerstam, 2014). Emphasizing the relative ease of PBE and using local resources may help teachers be more receptive to the approach. While teachers will still need to alert parents and the administration of their intention to take students out into the schoolyard, they will not have the safety or budgetary concerns associated with extensive off-campus excursions. Even short walking trips into the community will offer safe and inexpensive opportunities to relate student learning to the real world (Broda, 2007; Gruenewald, 2003; Smith, 2007). Most students have a natural curiosity about their environment and PBE helps teachers tap into these interests. Parents and community members are local resources that are included in PBE, awareness of these resources can address the perceived obstacle of lack of community partners.

Conclusion

Our study has similar and different findings than Ernst (2007, 2009). In her studies, knowledge and awareness of the environment was a key factor that influenced teachers to use education based in the environment. While this was important to teachers in the current study, it was not the top choice. She did note that her study found it is important for teachers to be receptive to using environment-based education, which was a popular perceived facilitator in our study. In general, the responses of Turkish teachers were comparable to those of teachers in the United States. Rather than regional or cultural issue, the perceived barriers relate more to the typical teachers' concerns of time, safety, and student achievement. Despite these commonly perceived barriers, the researchers believe PBE needs to be stronger in Turkish schools.

During PBE teacher education, it will be important to stress the interdisciplinary nature of outdoor education and use of local resources. The recent popularity of Pokeman GO™ and older activities such as geocaching show how technology can be taken outdoors. Social studies teachers can use community resources to make learning history and geography come alive by showing students historical and cultural landmarks. Although not a strong perceived facilitator in the current study, it would be interesting to learn if building stronger community partnerships could better support PBE. Mathematics students can study geometric patterns and nature and learn how foresters measure tree size and population density. Mathematics and social studies teachers who are already using local resources can share lessons and activities with other teachers on online forums and during conferences. In addition to subject area, teachers can learn how PBE is applicable to all grade levels. The outdoors can simply be used to foster children's sense of wonder and in more advanced lessons, be used as a setting to investigate complex environmental problems.

We will continue to investigate teacher awareness and use of PBE in Turkey. We anticipate follow-up interviews with respondents who do use PBE to gain deeper

insights into their perceived supports and barriers. One of the first steps we will take, however, is to ensure that PBE is included in the methods classes for all subject areas. As noted by Ernst (2007),

for preservice and in-service professional development, these changes may involve helping teachers to develop a comfort level in teaching outside the classroom walls, an understanding of their local natural and social environment, and skills in the interdisciplinary, project-based pedagogy that underlies environment-based education. (p. 28)

We encourage other researchers in Turkey and other regions of the world to conduct this survey to assess PBE perceptions and practices.

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References

- Ardoin, N. M. (2006). Toward an interdisciplinary understanding of place: Lessons for environmental education. *Canadian Journal of Environmental Education*, 11(1), 112–126.
- Baylor, A. L., & Ritchie, D. (2002). What factors facilitate teacher skill, teacher morale, and perceived student learning in technology-using classrooms? *Computers & Education*, 39(4), 395–414.
- Blatt, E. & Patrick, P. (2014). An exploration of pre-service teachers' experiences in outdoor 'places' and intentions for teaching in the outdoors. *International Journal of Science Education*, 36(13), 2243–2264. doi:10.1080/09500693.2014.918294
- Blau, I., & Peled, Y. (2012). Teachers' openness to change and attitudes towards ICT: Comparison of laptop per teacher and laptop per student programs. *Interdisciplinary Journal of E-Learning and Learning Objects*, 8(1), 73–82.
- Broda, H. W. (2007). *Schoolyard-enhanced learning: Using the outdoors as an instructional tool, K–8*. Portland, Maine: Stenhouse Publishers. Retrieved from <http://www.stenhouse.com/html/schoolyard-enhanced-learning.htm>
- Cincera, J., Johnson, B., & Kovacikova, S. (2015). Evaluation of a place-based environmental education program: From there to here. *Applied Environmental Education & Communication*, 14(3), 178–186. doi:10.1080/1533015X.2015.1067580
- Cook, K., & Buck, G. (2014). Pre-service elementary teachers' experience in a community of practice through a place-based inquiry. *International Journal of Environmental and Science Education*, 9(2), 111–132.
- Ernst, J. (2007). Factors associated with K-12 teachers' use of environment-based education, *The Journal of Environmental Education*, 38(3), 15–32, doi:10.3200/JOEE.38.3.15-32
- Ernst, J. (2009). Influences on US middle school teachers' use of environment-based education, *Environmental Education Research*, 15(1), 71–92, doi:10.1080/13504620802710599
- Fägerstam, E. (2014). High school teachers' experience of the educational potential of outdoor teaching and learning. *Journal of Adventure Education and Outdoor Learning*, 14(1), 56–81, doi:10.1080/14729679.2013.769887
- Gautreau, B. T., & Binns, I. C. (2012). Investigating student attitudes and achievements in an environmental place-based inquiry in secondary classrooms. *International Journal of Environmental and Science Education*, 7(2), 167–195.

- Gruenewald, D. A. (2003). Foundations of place: A multidisciplinary framework for place-conscious education. *American Educational Research Journal*, 40(3), 619–654.
- Gruenewald, D. A. (2005). Accountability and collaboration: Institutional barriers and strategic pathways for place-based education. *Ethics, Place & Environment*, 8(3), 261–283. doi:[10.1080/13668790500348208](https://doi.org/10.1080/13668790500348208)
- Kasalı, A., & Doğan, F. (2010). Fifth-, sixth-, and seventh-grade students' use of non-classroom spaces during recess: The case of three private schools in Izmir, Turkey. *Journal of Environmental Psychology*, 30(4), 518–532.
- Köşker, N., & Karabağ, S. (2012). Coğrafya eğitiminde yer temelli öğretim yaklaşımına ilişkin öğretmen görüşleri [Teacher opinions on place-based education approach in geography education]. *Türkiye Sosyal Araştırmalar Dergisi*, 16(3), 123–137.
- Marcouyeux, A., & Fleury-Bahi, G. (2010). Place-identity in a school setting: Effects of the place image. *Environment and Behavior*, 43(3), 344–362. doi:[10.1177/0013916509352964](https://doi.org/10.1177/0013916509352964)
- Meichtry, Y., & Smith, J. (2007). The impact of a place-based professional development program on teachers' confidence, attitudes, and classroom practices. *The Journal of Environmental Education*, 38(2), 15–32. doi:[10.3200/JOEE.38.1.15-34](https://doi.org/10.3200/JOEE.38.1.15-34)
- Miles, R. (2008). The importance of place in environmental education. In *Proceedings of the National Conference of the Australian Association of Environmental Education*. Sydney, Australia: Australian Association for Environmental Education.
- Milner, A. R., Sondergeld, T. A., & Rop, C. (2014). The influence of an intensive and integrated place-based professional development program on teachers' views of the nature of science. *Current Issues in Education*, 17(1), 1–17.
- Ozdemir, A., & Yilmaz, O. (2008). Assessment of outdoor school environments and physical activity in Ankara's primary schools. *Journal of Environmental Psychology*, 28(3), 287–300.
- Powers, A. L. (2004). An evaluation of four place-based education programs. *The Journal of Environmental Education*, 35(4), 17–32.
- Schutte, A. R., Torquati, J. C., & Beattie, H. L. (2017). Impact of urban nature on executive functioning in early and middle childhood. *Environment and Behavior*, 49(1), 3–30.
- Semken, S., & Freeman, C. B. (2008). Sense of place in the practice and assessment of place-based science teaching. *Science Education*, 92(6), 1042–1057.
- Simmons, D. (1998). Using natural settings for environmental education: Perceived benefits and barriers. *The Journal of Environmental Education*, 29(3), 23–31.
- Smith, G. A. (2007). Place-based education: Breaking through the constraining regularities of public school. *Environmental Education Research*, 13(2), 189–207.
- Sobel, D. (2004). *Place-based education: Connecting classrooms and communities*. Barrington, Massachusetts: The Orion Society.
- Tan, Y. S. M., & Atencio, M. (2016). Unpacking a place-based approach—“What lies beyond?” Insights drawn from teachers' perceptions of Outdoor Education. *Teaching and Teacher Education*, 56, 25–34.
- Tondeur, J., Hermans, R., van Braak, J., & Valcke, M. (2008). Exploring the link between teachers' educational belief profiles and different types of computer use in the classroom. *Computers in Human Behavior*, 24(6), 2541–2553.
- Ürey, M., & Çepni, S. (2014). The evaluation of the effect of science-based and interdisciplinary school garden program on student attitudes towards science and technology lesson regarding different variables. *Ondokuz Mayıs University Journal of Faculty of Education*, 33(2), 537–548.
- Zachariou, A., & Symeou, L. (2009). The local community as a means for promoting education for sustainable development. *Applied Environmental Education & Communication*, 7(4), 129–143.

Appendix A

Table A1. Frequency of perceived facilitators for using place-based education.

Questionnaire items	Agree		Somewhat agree		Disagree	
	N	%	N	%	N	%
Openness to different ways of teaching	24	92.3	2	7.8	—	—
Positive attitudes toward the environment	22	84.6	4	15.4	—	—
Evidence of positive academic outcomes associated with place-based education	22	84.6	4	15.4	—	—
Familiarity with ecological concepts	21	80.7	3	11.5	2	7.8
The subject(s) I teach	21	80.7	3	11.5	2	7.8
Administrative support for my environment-based approach	20	76.8	5	19.1	1	3.9
Adequate funding	20	76.8	4	15.4	2	7.8
Frequent contact with nature as a child	19	73.1	5	19.1	2	7.8
Witnessing environmental degradation	19	73.1	5	19.1	2	7.8
Watching or reading environmental or nature-oriented media (movies, books, TV shows)	19	73.1	3	11.5	4	15.4
Personal interests relating to nature or the environment	18	69.2	7	26.9	1	3.9
Belief that my actions can help solve environmental problems	18	69.2	7	26.9	1	3.9
The type of school where I teach (public, private, etc.)	18	69.2	4	15.4	4	15.4
Adequate time for planning/preparation	18	69.2	6	23.1	2	7.8
Spending time as a child outdoors with an adult role model	17	65.3	7	26.9	2	7.8
Transportation if needed	17	65.3	4	15.4	5	19.1
A natural area on school grounds	17	65.3	6	23.1	3	11.5
Coteachers I like working with	17	65.3	6	23.1	3	11.5
The grade level I teach	16	61.5	6	23.1	4	15.4
A natural area in the community	14	53.8	8	30.8	4	15.4
High comfort level with the outdoors	14	53.8	9	34.6	3	11.6
Local community partners	13	50.0	7	26.9	6	23.1
Parental support	12	46.1	10	38.5	4	15.4

Table A2. Frequency of obstacles perceived by teachers who use place-based education.

Questionnaire items	Agree		Somewhat agree		Disagree	
	N	%	N	%	N	%
Concerns regarding safety, liability, and classroom management	14	53.8	10	38.5	2	7.8
Emphasis on national testing	12	46.1	7	26.9	7	26.9
Lack of planning time	12	46.1	7	26.9	7	26.9
Lack of community partners	10	38.5	5	19.1	11	42.3
Lack of natural area to study	9	34.6	5	19.1	12	46.1
Lack of interest or lack of convincing evidence as to why I would want to	9	34.6	9	34.6	8	30.8
Lack of training at teacher training programs(and/or) in service education	8	30.8	9	34.6	9	34.6
Lack of environmental content knowledge	8	30.8	11	42.3	7	26.9
Lack of procedural/pedagogical knowledge	8	30.8	5	19.2	13	50
Lack of comfort being in the outdoors	8	30.8	3	11.5	15	57.7
The grade level I teach	7	26.9	4	15.4	15	57.7
Lack of funding	7	26.9	6	23.1	13	50
Lack of administrative support	7	26.9	5	19.1	14	53.8
Lack of transportation	7	26.9	4	15.4	15	57.7
Lack of support from parents	6	23.1	7	26.9	13	50
Against the school climate	4	15.4	5	19.1	17	65.3

Table A3. Frequency of the obstacles perceived by teachers who do not use place-based education.

Questionnaire items	Agree		Somewhat agree		Disagree	
	N	%	N	%	N	%
Concerns regarding safety, liability, and classroom management	35	79.5	3	6.8	6	13.7
Lack of planning time	31	70.4	7	15.9	6	13.7
Lack of administrative support	30	68.2	5	11.3	9	20.4
Lack of transportation	23	52.2	9	20.4	12	27.4
The subject area I teach	22	50.0	7	15.8	15	34.2
Emphasis on national testing	22	50.0	8	18.2	14	31.8
The grade level I teach	20	45.4	9	20.4	15	34.2
Lack of community partners	18	41	14	31.8	12	27.2
Lack of comfort being in the outdoors	18	41	17	38.7	9	20.4
Lack of interest or lack of convincing evidence as to why I would want to	18	40.9	13	29.5	13	29.5
Lack of natural area to study	16	36.3	10	22.7	18	41
Lack of funding	15	34.2	16	36.3	13	29.5
Lack of training at teacher training programs(and/or) in service education	14	31.8	13	29.5	17	38.7
Against the school climate	14	31.8	10	22.7	20	45.4
Lack of support from parents	12	27.2	18	41	14	31.8
Lack of environmental content knowledge	11	25	13	29.5	20	45.5
Lack of procedural/pedagogical knowledge	10	22.7	18	40.9	16	36.4

Table A4. Frequency of the obstacles perceived by teachers who do and do not use place-based education (PBE).

	N for teachers who do not use PBE	%	N for teachers who use PBE	%
Concerns regarding safety, liability, and classroom management	35	80	14	54
Lack of planning time	31	70	12	46
Lack of administrative support	30	68	7	27
Lack of transportation	23	52	7	27
Emphasis on national testing	22	50	12	46
Lack of community partners	18	41	10	39
Lack of natural area to study	16	36	9	35