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The Impact of Field Trips on Attitudes and Behaviours Related to Sustainable Environmental Education

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Abstract: Sustainability is a concept which is addressed with environment and development concepts and it aims the healthy transfer of natural resources to future generations. For these aims environmental education is regarded as an important tool of sustainable development. In this respect, various methods have become popular in recent years in order to endow individuals with sustainable environmental education. One of these methods is field trips. A field trip is a process in which students' abstract perceptions regarding the environment become concrete. In this research, the single-group pretest-posttest model, which aims to make measurements both before and after the experiment by applying an independent variable to a selected group, was employed. The sample of research consisted of 46 pre-service teachers in Ahi Evran University. Attitude and Behaviour Scale for Sustainable Environmental Education are used as data collection instruments. It was determined at the end of the research that the attitude and behaviour scores of the participant pre-service teachers had increased following the trip; however, the increase of behaviour scores was not significant. Therefore, it could be stated that organizing field trips is the best way of instilling sustainable environmental consciousness to pre-service teachers.

Key words: Sustainable Environmental Education · Attitude · Behaviour · Field Trips

INTRODUCTION

Sustainability is a concept which first emerged in the 1970s and then was mentioned in the Brundtland Our Common Future Report of the United Nations World Commission on Environment and Development (WCED) in 1987 [1-2]. In this report, the concepts of environment, development and sustainability were addressed together and the report was aimed at the healthy transfer of natural resources to future generations. The notion of sustainability would then become an important notion in education, especially in the field of environmental education [3]. The replacement of the "International Environmental Education Program, which had been executed by UNESCO in 1975–1995, by the "Education Program for a Sustainable Future" can be given as an example [4]. In this program, it was emphasized that development is not an exclusively economic matter, but it can be achieved through the inclusion of the ecological and social domains [5]. For this reason, environmental education is regarded as an important tool of sustainable development.

Environmental education comprises attitudes and behaviours related to the environment [6] and attitudes towards the environment involve many patterns such as awareness and anxiety about environmental issues, value judgments and assuming responsibility to resolve problems [7]. Attitude generally orientates the individual towards taking action about the object of attitude. An individual who has a positive attitude towards an object tends to act positively, get closer to and support that object; whereas an individual who has a negative attitude tends to stay indifferent to the object or to stay away from, to criticize and even to harm it [8]. Therefore, it could be argued that individuals who have negative environmental attitudes will be indifferent to environmental problems.

Another concept that is important in environmental education is behaviour; and there exist concrete ties between attitudes and behaviours [9]. Behaviours related to the environment are aimed not only at resolving problems but also at preserving existing resources and preventing potential problems [10]. In order for

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behaviours to turn into individual patterns, consciousness and attitudes are not enough, although they are very important [11-12].

In this respect, various methods have become popular in recent years in order to endow individuals with sustainable environmental education. One of these methods is field trips. A field trip is a process in which students' abstract perceptions regarding the environment become concrete [13]. It is also capable of enabling individuals to observe without needing a mediator, arousing curiosity on the subject and endowing groups with skills of listening, asking questions and communication [14]. Therefore, it is an effective instrument to be used while teaching the subject of ecology [15]. It enables students to observe the interactions between animals and plants through natural ways [16-17] to bridge their former knowledge with their knowledge on ecology [18] and to put into practice their theoretical knowledge on environmental subjects [19]. Although instructors convey information to students in field trips, the learning is mainly based on a direct interaction between the student and the environment [20].

Field trips positively affect students' knowledge on and attitudes towards the subject [21]. The fact that the learning environment is less formal than the one in the classroom positively affects the teacher-student relationship and thus it is among effective methods that can be used while teaching the subject of ecology [15].

MATERIALS AND METHODS

In this research, the single-group pretest-posttest model, which aims to make measurements both before and after the experiment by applying an independent variable to a selected group, was employed. In this design, the impact of the experimental action is tested through a study on a single group. Measurements of subjects with respect to the dependent variable are obtained in the forms of pretest -before the application- and posttest -after the application- on the same subjects using the same measurement instrument. It does not involve randomness or matching. The design can also be defined as single-factor inter-groups or repetitive measures design. In the design, the significance of the difference between the pretest and posttest values of a single group is tested [22].

The universe of the research consisted of pre-service Elementary Education Science, Social Studies and Classroom Teachers attending Ahi Evran University; whereas the sample consisted of 46 pre-service teachers who were randomly selected from the third-year students in the universe.

Data Collection Instrument: The researchers developed a 5-point Likert-type scale, which included sub-scales of attitude and behaviour, in order to employ it in the above-specified method.

Attitude Scale for Sustainable Environmental Education: 400 pre-service teachers, who were studying at the Elementary Education Departments of Science Teaching, Social Studies Teaching and Classroom Teaching at Ahi Evran University, participated in this scale development study. 37 of 67 items of the draft attitude scale were eliminated after the consideration of item total correlation values following the pilot study and as a result of the factor analysis. That is, the final form of the scale consists of 30 items. It was determined, based on the analyses performed, that the "Attitude Scale for Sustainable Environmental Education" has six factors. The Cronbach's Alpha reliability coefficient of the scale was found to be 0.904. This value suggests that the scale is highly reliable [23].

Behaviour Scale for Sustainable Environmental Education: In this scale development study, a total of 409 pre-service teachers from the departments of Science Teaching (104), Classroom Teaching (113), Social Studies Teaching (102) and Computer and Instructional Technologies Teaching (90) at Ahi Evran University. 40 of 69 items of the draft behaviour scale were eliminated after the consideration of item total correlation values following the pilot study and as a result of the factor analysis. That is, the final form of the scale consists of 29 items. Moreover, it was determined that the "Behaviour Scale for Sustainable Environmental Education" has three factors. The Cronbach's Alpha reliability coefficient of the scale was found to be 0.944. This value suggests that the scale is highly reliable [24].

Collection of Data: Two weeks before the field trip, the scales were administered to the sample in the form of pretest and then a trip was made to the Seyfe Lake in line with the trip-observation technique. The reasons this site was selected are that it is a nesting site for migratory birds, especially flamingos, that it is home to various species and that it is a Natural Reserve Area. Before the trip, students were provided with the opportunity to visit

the museum located in the area and to watch videos on the animal and plant species found in the Seyfe Lake and they were informed about what and how to observe. In the observation process, they were given binoculars and cameras in order to pique their interest in the subject. The bird species and plant species found in the Seyfe Lake were examined. After the field trip, a tea break was given in the Malya Farm on the way back; and there students observed on site the ways animals like sheep and cows were nourished, their living spaces and available tree species.

Following the trip, the scales were administered in the form of posttest. Analyses were made in line with the data obtained.

Analysis of Data: The quantitative data collected through the instrument were transferred to the SPSS 15.00 software. Normality of the data was tested before they were analyzed. Kolmogrow-Simirnov and Shapiro Wilk tests are employed in order to test whether data sets are normally distributed or not. The latter is used when the number of data is less than 29, whereas the former is employed when the number of data is 29 or more [25]. In this respect, according to the results of the Kolmogrow-Simirnov test, it is seen that the scale is normally distributed in terms of pretest and posttest (attitude pretest Kolmogrow-Simirnov =.504, p>.05; attitude posttest Kolmogrow-Simirnov =.993, p>.05).

The same was also observed for the behaviour scale (behaviour pretest Kolmogrow-Simirnov=.984, p>.05; behaviour posttest Kolmogrow-Simirnov=.994, p>.05). For the scores on the test related to the sub-problems of the research; t-test was employed for binary variables and One-Way Variance Analysis (One Way ANOVA) for multiple (more than two) variables. When the difference between groups was found to be significant; the effect size eta-squared (η^2) value was examined and the eta-squared value obtained was interpreted according to the Cohen d index, which is one of effect size indexes. Effect sizes were defined as small, medium and large, respectively (.01, .06 and .14) [26].

RESULTS

Table 1 shows the results of the paired samples t-test related to the attitude scale which was administered to the pre-service teachers before the field trip as pretest and after the field trip as posttest.

Table 1: T-Test results of the pretest and posttest mean scores of the attitude scale for sustainable environmental education

Tests	N	$\bar{x}$	S	Sd	t	p	η^2
Pre test	46	109.91	12.88	45	2.94	.005	0.21
Post test	46	115.63	13.40				

Table 2: T-Test results of the pretest and posttest mean scores of the behaviour scale for sustainable environmental education

Tests	N	$\bar{x}$	S	Sd	t	p
Pre test	46	118.10	14.65	45	1.84	.072
Post test	46	122.15	15.20			

It was determined that the attitude scores of pre-service teachers towards sustainable environmental education rose after the field trip; however, this rise was not significant [$t_{(45)}$= 1.84, p>.05].

Table 2 shows the results of the paired samples t-test related to the behaviour scale which was administered to the pre-service teachers before the field trip as pretest and after the field trip as posttest.

After the trip, it was found that the behaviour scores of pre-service teachers towards sustainable environmental education had increased [$t_{(45)}$= 2.94, p<.05]. The mean behaviour score rose from $\bar{x}$ = 109.91 to $\bar{x}$ = 115.63. The effect size (η^2) related to the significance of difference was found to be higher than 0.14 (η^2 =0.21); which indicated that the field trip had had a “large” effect [26].

CONCLUSION AND DISCUSSION

It was determined at the end of the research that the attitude scores of the participant pre-service teachers had increased following the trip; however, this increase was not significant. In the study conducted with university students by Ek, Kılıç, Öğdüm *et al*. [27], it was determined that those who take courses on the environment and those who participate in any activity related to the environment have significantly higher attitude scores than others. This finding is not in parallel with that of the current research. Given the facts that an attitude generally represents a tendency that paves the way for behaviour and that it is composed of cognitive, affective and behavioural elements; it would be wrong to assume that an attitude is something that can change after a single extracurricular field trip.

Another finding of the research is that students’ behaviour scores after the trip increased. The eta-squared value (η^2 =0.21) indicates that the field trip had a “large” effect on the behaviours of pre-service teachers. There exist studies that show that field trips positively influence students’ levels of interest and knowledge [28-29-30].

Field trips are significantly different from conventional teaching methods in which the teacher is highly active [20]. Students might learn before, during and after the field trip [20-31] however, it is one of the least preferred methods by teachers [13].

One would find dozens of studies if s/he is to classify studies on the positive effects of field trips on students. Field trips are important in terms of teach fields (motivation and concept development), socially (forming relationships), in terms of having adventures (mountain climbing, jumping over streams, navigating caves), environmentally (interacting with the environment) [32]. The use of conventional teaching methods in environmental education causes students to feel helpless and powerless [33]. Therefore, the use of field trips which are in line with the constructivist educational approach that is based on students' construction of knowledge [34, 35, 36, 37, 38, 39] is of great importance.

As Carlson [40] states, thousands of people graduate from universities every year and if only a few of them finish their education having acquired an awareness of sustainability, the world would be a very different place. Studies demonstrate that university students have positive attitudes towards sustainability [41] and these attitudes should be supported. The main purpose in field trips is students' active participation in the trip and thus their acquisition of awareness about the environment. Similarly, there are numerous studies that show that students' knowledge is consolidated during field trips and their social relations with peers and teachers become stronger [42, 43, 44, 45] Moreover, field trips offer authentic experiences and arouse interest and curiosity [46] and they improve the skills of assuming responsibility in learning processes [47]. Therefore, it could be stated that organizing field trips is the best way of instilling sustainable environmental consciousness to pre-service teachers.

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REFERENCES

1. Brundtland, G.H., ed. 1987. Our common future. New York: Oxford University Pressand World Commission on Environment and Development.
2. Bergmann, S., A. Pálsdóttir, E. Kristjánsdóttir, E. Björnsdóttir, G. Óskarsdóttir, K. Norğdahl and Svanborg Rannveig Jónsdóttir Og Şórunn Reykdal, 2008. Indications of sustainability-Education building on the experience of school sand society. Ed. A. Pálsdóttirand S. Bergmann. Reykjavík: KennaraháskóliÍslands [Ice land University of Education]. http:// skrif.hi.is/ geta/files/2009/02/ teikn_um_sjalfbaerni1.pdf (June 21, 2009).
3. Bonnett, M., 2002. Education for sustainability as a frame of mind. Environmental Education Research, 8(1): 9-20.
4. UNESCO, 1997. Educating for a sustainable future: A transdisciplinary vision for concerted action.http://www.unesco.org/education/tlsf/mods/ theme_a/popups/mod01t05s01.html. (April 2, 2013).
5. Buang, A., A. Habibah, J. Hamzah and Kaseh Abu Bakar, 2011. Orchestrating competing goals-the challenge of sustainable development. World Applied Sciences Journal, 13: 53-57.
6. Braus, J., 1995. Environmental education. Bioscience, 45(6): 45-52.
7. Erten, S., P. Ozdemir and T. Güler, 2003. Okul öncesi eğitim kurumlarindaki öğretmenlerin çevre bilinci düzeylerinin ve bu okullardaki çevre eğitim durumunun belirlenmesi, OMEP:2003 Dünya Konsey Toplantısı ve Konferansi Bildirisi Kuşadasi/ TÜRKIYE.
8. Aydın, G., 2010. Fen-teknoloji-toplum-çevre öğrenme alanının çevre bilinci kazandırmasına ilişkin sınıf öğretmenlerinin görüşleri. (Yayınlanmamış yüksek lisans tezi). Anadolu Üniversitesi Eğitim Bilimleri Enstitüsü, Eskişehir.
9. Kaiser F.G., B. Oerke and F.X. Bogner, 2007. Behavior-based environmental attitude: Development of an instrument for adolescents. Journal of Environmental Psychology, 27: 242–251.
10. Halpenny, E.A., 2010. Pro-Environmental behaviours and park visitors: The effect of place attachment. Journal of Environmental Psychology, 30: 409-421.
11. Schwartz, S.H. and J.A. Howard, 1982. Helping and cooperation: A self-based motivational model. In: V.J. Derlaga and J. Grzelak, (Eds.), Cooperation and helping behavior: Theories and Research, New York: Academic Press, pp: 327-352.
12. Schwartz, S.H. and J.A. Howard, 1984. Internalized values as motivators of altruism. In: E. Staub, D. Bar-Tal, J. Karylowski and J. Reykowski (Eds.), Development and maintenance of prosocial behavior: International perspectives on positive morality. New York: Plenum, pp: 229-253.

13. Lima, A., C. Vasconcelos, N. Félix, J. Barros and A. Mendonça, 2010. Field trip activity in an ancient gold mine: Scientific literacy in informal education. Public Understanding of Science, 19(3): 322-334.
14. Erden, M., 1996. Sosyal bilgiler öğretimi, Istanbul: Alkım Yayıncılık, pp: 64.
15. Lisowski, M. and J.F. Disinger, 1992. The effect of field-based instruction on students understanding on ecological concepts. Journal of Environmental Education, 23(1): 19-23.
16. Thomashow, M., 2001. A biosphere natural history. ORION, 20(4): 24-37.
17. Burkholder, R.E., 2003. To see things in their wholeness: Consilience, natural history and teaching literature outdoors. In: H. Crimmel, (Ed.), Teaching in the field: Working with students in the outdoor classroom, Salt Lake City, UT: The University of Utah Press, pp: 17-32.
18. Orr, D.W., 1992. Ecological literacy: Education and the transition to a postmodern world. Albany: SUNY Press.
19. Wilson, B.G., 1998. Constructivist learning environments: case studies in instructional design: Edited by Brent Gayle Wilson. New Jersey: Educational Technology Pub.
20. Orion, N., 1993. A Practical model for the development and implementation of field trips as an integral part of the science curriculum. School Science and Mathematics, 93(6): 325-331.
21. Dittrick, D., 2003. The value of place-based education, Department of Environmental Science, Barnard College, Broadway New York, USA.
22. Karasar, N., 2008. Bilimsel araştırma yöntemi. Ankara: Nobel Yayıncılık, pp: 192.
23. Afacan, Ö. and M.P. Güler Demirci, 2011. Sürdürülebilir çevre eğitimi kapsamında tutum ölçeği geliştirme çalışması. International Journal On New Trends In Education And Their Implications 2011, 27-29 April, Antalya-Turkey.
24. Demirci Güler, M.P. and Ö. Afacan, 2012. A study on developing a behaviour scale towards sustainable environmental education. Journal of Baltic Science Education (JBSE), 11(3): 224-235.
25. Kalaycı, Ş., 2010. SPSS uygulamalı çok değişkenli istatistik teknikleri. (3. Baskı). Ankara: Asil Yayın Dağıtım.
26. Büyüköztürk, Ş., 2003. Sosyal bilimler için veri analizi el kitabı. (Geliştirilmiş 3. Baskı). Ankara: Pegem A Yayıncılık, pp: 45-46.
27. Ek, H., N. Kılıç, P. Öğdüm, G. Düzgü and S. Şeker, 2009. Adnan Menderes üniversitesinin farklı akademik alanlarında öğrenim gören ilk ve son sınıf öğrencilerinin çevre sorunlarına yönelik tutumları ve duyarlılıkları. Kastamonu Eğitim Dergisi, 17(1): 125-136.
28. Ramey-Gassert, L., 1997. Learning science beyond the classroom. The Elemantary School Journal, 4: 433-450.
29. Braund, M. and M. Reiss, 2006. Towards a more authentic science curriculum: The contribution of out-of-school learning. International Journal of Science Education, 28(12): 1373-1388.
30. Falk, J.H. and L.M. Adelman, 2003. Investigating the impact of prior knowledge and interest on aquarium visitor learning. Journal of Research in Science Teaching, 40(2): 163-176.
31. Orion, N., 2007. A holistic approach for science education for all. Eurasia Journal of Mathematics, Science and Technology Education, 3(2): 99-106.
32. Orion, N. and A. Hofstein, 1991. The measurement of student's attitudes towards scientific field trips. Science Education, 75(5): 513-523.
33. Hillcoat, J., K. Forge and E. Baker, 1995. I think it's really great that someone is listening to us…: young people and the environment, Environmental Education Research, 1(2): 159-171.
34. Gennaro, D.D., 1981. The effectiveness of using pre-visit instructional materials on learning for a museum field trip experience. Journal of Research in Science Teaching, 18: 771-781.
35. 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.
36. Sebasto, N.J.S. and L. Cavern, 2006. Effects of pre- and post trip activities associated with a residential environmental education experience at the New Jersey school of conservation students' attitudes toward the environment. Journal of Environmental Education, 37(4): 3-17.
37. Farmer, J., D. Knapp and G.M. Benton, 2007. 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.

38. DiEnno, C.M. and S.C. Hilton, 2005. High school students' knowledge, attitudes and levels of enjoyment of an environmental education unit on nonnative plants. The Journal of Environmental Education, 37(1): 13-25.
39. Hutzel, W. and D. Goodman, 2004. Remotely accessible solar energy laboratory for high school students. 34th ASEE/IEEE Frontiers in Education Conference. October 20-23, 2004, Savannah, GA.
40. Carlson, S., 2006. The sustainable university. The Chronicle of Higher Education, 53 (9), http://agecon-cpanel.unl.edu/lynne/ecolecon/insearchofthesustainablecampus.pdf. (April 3, 2013).
41. Wan Nur'ashiqin, W.M., A.C. Er, A. Noraziah, L. Novel, H. Halimaton Saadiah and A. Buang, 2011. Diagnosing knowledge, attitudes and practices for a sustainable campus. World Applied Sciences Journal, 13: 39-98.
42. Fuller, I.C., S. Gaskin and I. Scott, 2003. Evaluation of student learning experiences in physical geography fieldwork: Paddling or Pedagogy. Journal of Geography in Higher Education, 24: 199-215.
43. Tal, R.T., 2001. Incorporating field trips as science learning environmental enrichment-an interpretative study. Learning Environments Research, 4: 25-49.
44. Rennie, L.J., E. Feher, L.D. Dierking and J.H. Falk, 2003. Toward an agenda for advancing research on science learning in out-of-school settings. Journal of Research in Science Teaching, 40(2): 112-120.
45. Van Loon, A.J., 2008. Geological education of the future. Earth Science Reviews, 86: 247-254.
46. Pedretti, E., 1997. Septic tank crisis: A case study of science, technology and society education in an elementary school. International Journal of Science Education, 19(10): 1211-1230.
47. Olson, J.S., A.M. Cox-Petersen and W.F. McComas, 2001. The inclusion of informal environments in science teacher preparation. Journal of Science Teacher Education, 12(3): 155-173.