JOURNAL OF BALTIC SCIENCE EDUCATION

ISSN 1648-3898 /Print/
ISSN 2538-7138 /Online/

THE EFFECTS OF ELECTIVE COURSE DESIGNED WITH DIFFERENT CONTENTS ON PRE-SERVICE SCIENCE TEACHERS' SELF-EFFICACY BELIEFS AND KNOWLEDGE ABOUT ORGANIZING CURRICULUM BASED FIELD TRIPS

Aykut Emre Bozdoğan

Abstract. *This research examined the effect of a course designed with different content on pre-service science teachers' self-efficacy beliefs and knowledge about organizing curriculum-based trips. A pre-test post-test quasi experimental design was used in the research. One-hundred and thirty pre-service science teachers participated in the research. The research was carried out within the context of an elective course called "Informal Learning Environments in Science Education" and was conducted over 14 weeks in total for two hours per week. The research data were obtained by means of a questionnaire, self–efficacy scale for designing curriculum-based field trips (CFTSES) and semi-structured focus-group interviews. As a result of the research, it was found that the course content which included in-class and out-of-school setting practices in the 3rd group was the most effective. This was followed by the 2nd group which included only in-class implementations. The first group which was supported with visuals and theoretical related presented information was the group which was the least effected. The results of the research revealed that pre-service science teachers had mainly different concerns about safety, but that this did not deter them, as they still continued to design curriculum-based field trips for learners.*

Keywords: *elective course, field trip, knowledge level, pre-service teachers, self-efficacy.*

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Introduction

Today teaching activities have become a life-long process that uses all the resources in the environment besides schools. These resources which promote instruction in schools and also called informal learning settings involve many social areas (Hannu, 1993). When compared to education at school, these settings are more natural, flexible, and fun and they also offer learning opportunities with the activities they present considering the individuals' field of interests and learning pace (Krakowka, 2012). In addition, out of school environments offer opportunities for students to gain different experiences. These environments are rich teaching resources and they support in school teaching activities (Taylor & Caldarelli, 2004). Many research studies reveal that out-of-class settings have positive effects on students' cognitive (Anderson & Lucas, 1997; Miglietta, Belmonte & Boero, 2008), affective (DeWitt & Storksdieck, 2008; Lai, 1999), and psychomotor (Houser et. al., 2011; Morag & Tal 2012) learning. There are studies which reveal that well-designed and organized trips achieve their purposes (Bozdoğan, 2007, 2012; DeWitt & Storksdieck, 2008). In this context, it is necessary to focus on the planning, implementation, and evaluation processes of field trips so these trips with their many advantages like providing real life experience can attain their goals (Bowker & Tearle, 2007; Bozdoğan, 2007, 2012; Coughlin, 2010; Hurley, 2006; Kisiel, 2005; Pasquier & Narguizian, 2006).

Teachers play a very important role in designing and organizing trips to out-of-school environments to promote education at school. Kete & Horasan (2013) state that the teachers have to be actively involved in the different phases of organizing the curriculum-based field trips to out-of-school settings and they have to invest a great deal of time and effort into planning successful school trips. However, the research studies reveal that although

ISSN 1648–3898 /Print/
ISSN 2538–7138 /Online/

teachers know that field trips to out of school settings will have positive impacts on learners, they do not prefer these activities, because they do not feel adequately skilled pertaining to the pedagogical related aspects to utilise these trips as teaching and learning opportunities. Equally important, it appears that many teachers have indicated that they do not have the necessary literature to assist them with the planning process of these trips (Anderson, Bethan & Mayer-Smith, 2006; Bowker, 2004; Griffin & Symington 1997; Ferry, 1993; Kisiel 2003; Michie, 1998; Olson, Cox-Petersen & McComas, 2001; Tal, Bamberger & Morag, 2005 Tal & Morag, 2009; Tal & Steiner 2006).

Moreover, the research studies indicated that not only teachers, but also learners lack knowledge and experience about planning trips to out-of-school settings (Bozdoğan, 2012; Wunder, 2002). However, it is stated in literature that training offered to pre-service teachers at university about planning trips to out-of-school settings yield successful results (Catherine & Catherine, 2011; Chin, 2004; Munakata, 2005). For example, the research carried out by Krahenbuhl (2014) offered opportunities for pre-service teachers to implement their teaching practices about planning field trips with the students and pre-service teachers' views were taken within the context of this implementation. Bozdoğan (2012) stated that most of the pre-service teachers stated that this experience made positive contributions to them in terms of organizing a trip, coordinating students, using time efficiently and collaborating with other teachers. In addition, pre-service teachers stated that they became aware of the importance of out-of-school settings in education and when they became teachers, they would use field trips easily as a teaching method. It is stated in another research that the education given to pre-service teachers about planning curriculum-based trips developed their ability and knowledge to organize trips and increased their self-efficacy.

It is evident that the studies carried out revealed that both teachers and pre-service teachers encountered different problems related to organizing trips, particularly curriculum-based trips associated with the secondary science course. In this context, the importance of the need for professional training for the solution of these problems was highly recommended (Bozdoğan, 2012; Wunder, 2002). If pre-service teachers receive such training during their university education, it could enable them to utilise out-of-school environments (excursions or field trips) to promote teaching and learning by means of using alternative contexts. At this point, this following question needs to be answered: In order to use out-of-school settings effectively in education, what kind of course and content should be designed and developed within the content of the pre-service teacher training?

This research was planned by considering social constructivism, which emphasizes the collaborative nature of learning via constructing knowledge with culturally and socially organized activities. Social constructivists posit that knowledge is constructed in social context (Fer, 2009; Fer & Cırık, 2007). In social constructivists learning environments, the key is to establish how to construct environments in which learners could learn optimally with a view to construct their knowledge (Henson, 2003; Tudge, 1990). These environments have flexible and interactive structures and they support active participation of the learners for the construction of knowledge (Akyol, & Fer, 2010). The responsibility of the teacher is to guide the construction of knowledge, play the role of a facilitator and make contributions to learners to increase their learning potential related to the learners' knowledge by means of the teacher's guidance (Fer, 2009). Through collaboration, learners can assist their peers, become a role model to them and encourage them in this process (Akyol, & Fer, 2010).

This research aimed to reveal the effects of three different course designs. These course designs are theoretical information supported with visuals (experiment-1), had in-class practises with theoretical information (experiement-2), and had both in-class and outside class practices in addition to theoretical knowledge (experiment-3) for pre-service teachers.

The Purpose of the Research

The aim of the research is to examine the effect of the same elective course with different designs on pre-service science teachers' self-efficacy beliefs and knowledge levels about organizing curriculum-based field trips. Answers to the following research questions were sought within the framework of the research problem:

1. Does the different course content developed within the context of the same elective course have an effect on pre-service science teachers' knowledge levels about organizing curriculum-based field trips?
2. Does the different course content developed within the context of the same elective course have an effect on pre-service science teachers' self-efficacy beliefs about organizing curriculum-based field trips?
3. What are the pre-service teachers' concerns about organizing curriculum-based field trips?

ISSN 1648–3898 /Print/
ISSN 2538–7138 /Online/

Methodology of the Research

Research Design

A pre-test post-test quantitative experimental design was used in the research. The groups (not randomly assigned) are compared in terms of specific variables in quasi–experimental design (Büyüköztürk et. al., 2010). The research was carried out within the context of the elective course designed by the researcher named "Informal Learning Environments in Science Education". Nine teaching packs with presentations and practices were designed within the content of the elective course which was planned and organized for 14 weeks and two contact sessions per week (50 minutes x 2 contact sessions). Table 1 presents the weeks of research, as well as at what stage the pre- and post-tests were conducted for each of the three groups.

Table 1. Research plan developed for implementation process.

Weeks **(50'x2)**	Control Group	Experimental Group -1 **(N=34)**	Experimental Group -2 **(N=32)**	**Experimental Group -3 (N=31)**
1st Week	Pre-tests	Pre-test	Pre-tests	Pre-tests
2nd Week	---	T.P. 1	T.P. 1	T.P. 1
3rd Week	---	T.P. 1	T.P. 2-3	T.P. 2-3
4th Week	---	T.P. 2	T.P. 3	T.P. 3
5th Week	---	T.P. 3	T.P. 4	T.P. 4
6th Week	---	T.P. 3	T.P. 5	T.P. 5
7th Week	---	T.P. 4	T.P. 5	T.P. 5-6
8th Week	---	T.P. 5	T.P. 5-6	T.P. 7
9th Week	---	T.P. 5	T.P. 7	T.P. 7
10th Week	---	T.P. 5	T.P. 7	T.P. 7
11th Week	---	T.P. 6	T.P. 7	T.P. 8
12th Week	---	T.P. 6	T.P. 7	T.P. 9
13th Week	Post tests	Post tests	Post tests	Post tests
14th Week	---	Focus-group interview	Focus-group Interview	Focus-group interview

T.P: Teaching Package

When the teaching packs are categorized, the first six teaching packs include the presentations within the context of the elective course which the researcher developed for the pre-service teachers. Teaching pack 7 includes the pre-service teachers' individual in-class practices and teaching packs 8 and 9 include out-of-school setting practices (see Appendix 1 for more detail).

As seen in Table 1, both pre-tests and post-tests were administered at the same time with the three experimental groups and control group. It took nearly 45 minutes for the four groups to answer the pre-test and 40 minutes for the post-tests.

Participants

The research was carried out with fourth year pre-service science teachers who will be teaching at secondary schools after they graduated. A total of 130 pre-service science teachers participated in the research. Within this context, the researcher added an elective course called "Informal Learning Environments in Science Education" during the last term (January to May). Ninety-seven students who chose this course in three different classes volunteered to participate in the research and hence formed part of the experimental groups. Thirty-four 4th year pre-service science teachers in one class did not choose this course and they were used as the control group. The age range of pre-service teachers participating in the research ranged between 21 and 27. Table 2 presents the demographic characteristics of the pre-service teachers participating in the research.

ISSN 1648–3898 /Print/
ISSN 2538–7138 /Online/

Table 2. Demographic information of the pre-service teachers in experimental and control groups (f).

Demographic Information	Control Group (N=33)	Experimental group-1 (N=34)	Experimental group-2 (N=32)	Experimental group-3 (N=31)	TOTAL (N=130)
	f (%)	f (%)	f (%)	f (%)	f (%)
Gender					
Male	10 (13%)	8 (6.15%)	11 (8.5%)	9 (6.9%)	38 (29%)
Female	23 (17.7%)	26 (20%)	21 (16.15%)	22 (16.9%)	92 (71%)
Type of high school they graduated					
High School	26 (20%)	22 (16.9%)	23 (17.7%)	20 (15.4%)	91 (70%)
Anatolian High school	5 (3.8%)	11 (8.5%)	4 (3%)	6 (4.6%)	26 (20%)
Other*	2 (1.5%)	1 (0.75%)	5 (3.8%)	5 (3.8%)	13 (10%)
Past experiences of joining a trip					
Yes	25 (19.2%)	20 (15.4%)	20 (15.4%)	24 (18.5%)	89 (68.5%)
No	8 (6.15%)	14 (10.8%)	12 (9.3%)	7 (5.4%)	41 (31.5%)
The Period they went on a trip					
University	6 (4.6%)	9 (6.9%)	7 (5.4%)	6 (4.6%)	28 (21.5%)
High School	8 (6.15%)	6 (4.6%)	9 (6.9%)	10 (13%)	33 (25.4%)
Elementary School	11 (8.5%)	5 (3.8%)	4 (3%)	8 (6.15%)	28 (21.5%)
Where they visited					
Science Centre/Museum	7 (5.4%)	6 (4.6%)	5 (3.8%)	5 (3.8%)	23 (17.7%)
Zoo	7 (5.4%)	3 (2.25%)	3 (2.25%)	6 (4.6%)	19 (14.6%)
Botanical Garden	4 (3%)	5 (3.8%)	5 (3.8%)	3 (2.25%)	17 (13.1%)
National park	5 (3.8%)	3 (2.25%)	5 (3.8%)	4 (3%)	17 (13.1%)
Natural Statue	1 (0.75%)	1 (0.75%)	2 (1.5%)	3 (2.25%)	7 (5.4%)
Industrial/ Public Org.	1 (0.75%)	2 (1.5%)	0 (0%)	3 (2.25%)	6 (4.6%)
Who they went on a trip with					
School	22 (16.9%)	14 (10.75%)	16 (12.3%)	22 (16.9%)	74 (56.9%)
Other **	3 (2.25%)	6 (4.6%)	4 (3%)	2 (1.5%)	15 (11.5%)
Receiving a training about planning a trip					
Yes	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
No but I need it	33 (25.4%)	33 (25.4%)	29 (22.3%)	30 (23%)	125 (96%)
No and I do not need it	0 (0%)	1 (0.75%)	3 (2.25%)	1 (0.75%)	5 (4%)

**Open-High School, Trade Vocational School., College, Anatolian Technical Vocational School, Industrial Vocational School.;*
***Family, Friends*

Data Collection Tools

A questionnaire form, self-efficacy belief scale about planning a curriculum-based field trip (CFTSES) and semi-structured focus-group interview schedule developed by the researcher were used during the process of data collection.

a) *Questionnaire form:* The questionnaire form was developed by the researcher and its content validity was established by taking the opinion of two experts working on informal learning environments. The questionnaire consisted of two parts. There were 8 closed-ended questions about the demographic

ISSN 1648–3898 /Print/
ISSN 2538–7138 /Online/

characteristics of the participating pre-service science teachers. The second part of the questionnaire contained the open-ended questions such as "*How can you organize a curriculum-based field trip? What do you pay attention to during this process?"* There were 26 statements (see Appendix 2). One mark was allocated when a student indicated that he/she has adequate knowledge about the provided statement.

b) *Self-efficacy scale for planning a curriculum-based field trip* (CFTSES): A measurement tool which measured the pre-service teachers' self-efficacy levels about planning a curriculum-based field trip and prepared by the researcher was used. Firstly, the researcher created an item pool consisting of 45 items. The opinions of two field experts and two science teachers and an expert in linguistics were consulted regarding the 45 items. These experts examined whether or not the items in the scale measured the self-efficacy beliefs about organizing an educational trip to out-of-school settings and the intelligibility of the statements and expressions. As a result of the experts' opinions, 39 items were considered appropriate from the item pool of 45 items and were then included to be used as self-efficacy statements. Thus, the content validity of the measurement tool was established. In line with the expert opinions, the items were organized, and the face validity was also established for the various self-efficacy items. At the end of the factor analyses, 9 items were excluded as they were not deemed suitable to ascertain self-efficacy. Based on the analysis described above, a 5point Likert scale that consisted of 30 items was designed. Seventeen items were positive statements and thirteen items were negative statements. The scale has one factor and scale's score points change between 30 and 150. It was revealed that the factor loading values of the scale whose reliability analysis was carried out with 358 participants were between 0.460 and 0.706. The scale's item-total correlation coefficients changed between 0.585 and 0.759. As a result of the reliability analysis, the scale's Cronbach Alfa reliability coefficient was calculated as 0.931, the Guttmann Split-Half value was 0.889 and the Spearman Brown reliability coefficient was 0.889 (Bozdoğan, 2016). These results revealed that the scale's reliability was quite high, as each item in the scale met the scale's need to measure the features at a significant level (see Appendix 3).

c) *Semi-structured focus-group interview:* This measurement tool developed by the researcher consisted of only one question. The content validity of the measurement tool was established by consulting two field experts and an expert in linguistics. A total of 6 pre-service teachers, three females and three males, were chosen randomly and at the end of the research from each of the three groups. These groups formed the interview groups. The interviews lasted approximately 25 minutes each. The focus group question posed was, "*After becoming a teacher, are there any conditions or concerns which you think will bother you about planning a curriculum-based field research? If there are any, what are they?"*

Data Analysis

Qualitative and quantitative data analyses were utilized for the data analysis of the research. Quantitative data were analysed by using frequency, arithmetic average, t-test and ANOVA analysis for both questionnaire forms and self-efficacy scale. The numeric data were tabulated and interpreted. In addition, whether or not there was a significant difference between the independent variables was tested at the level of α=.05. A form consisting of 26 items which included the necessary steps to plan and carry out a curriculum-based field trip was developed by consulting two field experts and using the studies in literature (Anderson & Lucas, 1997; Bozdoğan, 2007, 2012; Kisiel, 2005; Morag & Tal 2012). Moreover, it was used for the analysis of an open-ended question (see Appendix 2). The responses given to the open-ended question in the questionnaire form were analysed by two field experts independently of one another and each correct answer was given 1 point. The following equation was used to calculate compatibility percentages: P = (Nax100) / (Na + Nd) (P: compatibility percentage, Na: compatibility rate, Nd: incompatibility rate) (Türnüklü, 2000). As a result of scoring, it was found that both researchers' compatibility percentage was around 94%.

The data from the question in the semi-structured focus-group interview was analysed by means of thematic analysis. The data obtained from the voice recordings of the pre-service teachers were analysed by two field experts independently of one another and the statements of the pre-service teachers were coded by giving them names. Then, considering the common points, themes were generated by bringing these codes together. Finally, the researchers organized these codes and themes and tabulated them. As a result of the content analysis, the compatibility percentage was calculated by using the formula given above and it was found to be 92%.

Results of the Research

One open-ended question and a self-efficacy scale were also included. This self-efficacy instrument was administered to the control and experimental groups to determine their self-efficacy pertaining to their knowledge and beliefs about planning curriculum-based field trips before the research and again after the intervention. The arithmetic averages of pre-service teachers' knowledge levels about organizing a curriculum-based trip and pre-service teachers' (CFTSES) scale scores are presented in Table 3.

Table 3. Comparison of arithmetic averages of the pre-service teachers' knowledge levels about organizing a curriculum-based trip and (CFTSES) scale scores before the research.

Variables	f	Pre-test (Knowledge Scores)	Pre-test (CFTSES Scores)
		M (SD)	M (SD)
Control Group	33	7.66 (2.20)	100.7 (11.97)
Experimental-1 Group	34	7.73 (2.41)	97.26 (15.15)
Experimental-2 Group	32	7.65 (2.18)	103.2 (12.46)
Experimental-3 Group	31	7.09 (2.08)	100.0 (13.14)

According to the pre-test, total scores for questionnaire form about planning a curriculum-based field trip were determined as control group (M=7.66), experimental group-1 (7.73), experimental group-2 (M=7.65) and experimental group-3 (M=7.09). There was not a significant difference between the four groups' pre-test knowledge scores [$F_{(3-129)}$=.560, p=.642; p>.05]. In addition, the self-efficacy beliefs of the groups participating in the research about planning a curriculum-based field trip were control group (M=100.7), experimental group-1 (97.26), experimental group-2 (M=103.2) and experimental group-3 (M=100), respectively. There was not a significant difference between the self-efficacy belief scores of the four groups participating in the research [$F_{(3-129)}$=1.149, p=.332; p>.05]. Within this context, it can be stated that both control and experimental groups' knowledge levels and self-efficacy beliefs about planning a curriculum-based field trip before the research were equal.

The arithmetic averages of pre-service teachers' knowledge levels about organizing a curriculum-based trip were compared and are presented in Table 4 and Table 5.

Table 4. Comparison of arithmetic averages of the pre-service teachers' knowledge levels about organizing a curriculum-based trip.

Variables	f	Pre-test		Post-test		Difference Scores	(η2)
		M (SD)	Min-Max	M (SD)	Min-Max		
Control Group	33	7.66 (2.20)	4-12	7.84 (2.43)	3-13	0.18	0.04
Experimental-1 Group	34	7.73 (2.41)	3-14	9.94 (2.22)	5-16	2.21	0.43
Experimental-2 Group	32	7.65 (2.18)	4-13	12.50(2.51)	7-19	4.85	0.71
Experimental-3 Group	31	7.09 (2.08)	4-13	13.10(3.50)	6-21	6.01	0.72

Table 5. One-way ANOVA results related to post-test pre-test difference scores of pre-service teachers' knowledge level scores about organizing a curriculum-based trip.

Source of Variance	Sum of Squares (SS)	SD	Mean Squares (MS)	F	p	Significant Difference
Between- group	663.436	3	221.145			
Within-group	1088.687	126	8.640	25.594	<.001	1-2,3,4 2-3,4
Total	1752.123	129				

1. Control Group, 2. Experimental Group-1, 3. Experimental Group-2, 4. Experimental Group -3

ISSN 1648–3898 /Print/
ISSN 2538–7138 /Online/

When pre-service teachers' knowledge levels about organizing a curriculum-based trip were examined, it was determined that there was a significant difference between the control group's total pre-test post-test difference scores and the pre-test post-test difference scores of experimental group-1 (p=.013), experimental group-2 (p<.001) and experimental group-3 (p= p<.001). This result reveals that different course designs implemented in experimental groups appear to significantly enhance pre-service teachers' knowledge levels about organizing a curriculum-based field trip. Moreover, a significant difference between experimental group-1 and experimental group-2 (p=.002) and experimental group-3 (p<.001) was determined [$F_{(3\text{-}129)}$=25.594, p<.001]. In addition to this, there was not a significant difference between experimental group-2 and experimental group-3 (p=.667). It was found that experimental group-3 had the highest total scoring difference (M=6.01) and experimental group-2 (M=4.85) and experimental group-1 (M=2.21) followed it, respectively. However, it was revealed that the most effective course designs were the implementations carried out in experimental group-2 (η^2=.71) and experimental group-3 (η^2=.72).

The pre-service teachers' total scores from the (CFTSES) scale were also compared and are presented in Table 6 and Table 7.

Table 6. Comparing arithmetic averages of scores, the pre-service teachers got from (CFTSES) scale.

Variables	f	Pre-test		Post-test		Difference Scores	(η^2)
		M (SD)	Min-Max	M (SD)	Min-Max		
Control Group	33	100.7 (11.97)	66-127	101.0 (8.54)	82-116	0.03	0.01
Experimental-1 Group	34	97.26 (15.15)	60-125	105.2 (13.79)	82-130	7.94	0.26
Experimental-2 Group	32	103.2 (12.46)	76-132	114.4 (10.53)	95-135	11.18	0.44
Experimental-3 Group	31	100.0 (13.14)	81-134	124.3 (8.15)	105-140	24.32	0.74

Table 7. One-way ANOVA results related to the post-test pre-test difference scores of pre-service teachers' knowledge test.

Source of Variance	Sum of Squares (SS)	SD	Mean Squares (MS)	F	p	Significant Difference
Between- group	9586.391	3	3195.464			
Within-group	15992.501	126	126.925	25.176	<.001	1-2,3,4 4-2,3
Total	25578.892	129				

1. Control Group, 2. Experimental Group-1, 3. Experimental Group -2 4. Experimental Group -3

When pre-service teachers' self-efficacy belief levels about organizing a curriculum-based field trip were examined, it was found that there was a significant difference between the control group's total pre-test post-test difference scores and the pre-test post-test difference scores of experimental group-1 (p=.22), experimental group-2 (p<.001) and experimental group-3 (p<.001). This result exhibits that different course designs implemented in experimental groups significantly promoted pre-service teachers' self-efficacy beliefs about organizing a curriculum-based field trip. Moreover, a significant difference between experimental group-3 and experimental group-1 (p=.002) and experimental group-2 (p<.001) was determined [$F_{(3\text{-}129)}$=25.176, p<.001]. However, there was not a significant difference between experimental group-1 and experimental group-2. (p=.861). It was found that experimental group-3 had the highest total scoring difference (M=24.32) and experimental group-2 (M=11.18) and experimental group-1 (M=7.94) followed it, respectively. However, it was revealed that the most effective course design belonged to the practices carried out in experimental group-3 (η^2=.74).

Results of Semi-Structured Interviews

Question: "Despite everything, after you become a teacher, are there still any conditions which you think can cause problems or you have reservations about planning a curriculum-based trips? If there are, what are they?"

ISSN 1648–3898 /Print/
ISSN 2538–7138 /Online/

When Table 8 is examined, it is evident that pre-service teachers have mostly reservations about the process during the trip, as more codes have been identified related to during the trip.

Table 8. Content analysis about pre-service teachers' responses in experimental groups.

Theme	Code	Explanation (f)	f
Before the trip	1.Parent permission	Lack of parental consent from students' parents (3)	3
	2. Behaviours of directors and colleagues	Asking to stick to curriculum (1)	1
During the trip	3. Security and Safety	Not being able to provide security for students (12)	15
		Lack of class management on the trip site (3)	
	4. Guidance	Lack of student care at a desired level (2)	8
		Lack of guidance (2)	
		Lack of interaction and communication with students (2)	
		Lack of student motivation (1)	
		Causing misconceptions while guiding students (1)	
	5. Purpose	The trip fails to meet the students' expectations (2)	3
		The trip does not meet the purpose (1)	
	6. Organization	Not being able to meet the needs on long trips (2)	2

** M; Male, F; Female, Exp.; Experimental*

Parent permission (Code 1): When Table 8 is examined, it is revealed that three of the pre-service teachers were concerned that students' parents would not consent to such trips. issue. A pre-service teacher answered this question like that: *"You take a group on a trip and you have to take care of them because anything can happen at any time. That's why getting parent's permission can be a problem. Families may not want their children to go on a trip, as a result, there are risks because children are in the nature (Exp-1, M_1)"*. Still another teacher said, "*What makes me concerned is parental permission. They can have such questions in their minds like how they can trust them and get their children assigned to the teachers. I don't think that I will have any other problems (Exp-1, F_1)"*.

Behaviours of directors and colleagues (Code 2): When Table 8 is examined, it is revealed that one of them was concerned that school's administration would not like them to digress from the curriculum and he had scruples about getting intro troubles with his colleagues about this issue. This pre-service teacher's response to this question draws attention: *"Taking responsibility is generally a problem but I trust myself at that point. The point that I am most concerned can be my colleagues' and administrators' reactions because the administration may think about not bringing troubles to them and not doing anything extra because I experienced such a thing in the school where I underwent training. Teachers share the idea that they will tell in their lessons, but they do not want to do any extra thing. For example, when a teacher runs more classes in a laboratory, the students in the other class ask why they do not do experiments or run classes in the laboratory and this causes problems between the colleagues. This is what I am concerned about. In addition, the trips are usually organized to have a picnic and to see new places. If students have such an expectation from a trip, I think they will cause some problems (Exp-1, F_2)"*

Security and Safety (Code 3): The data suggest that nearly all of nearly all of the pre-service teachers in three of the experimental groups stated that they had reservations about not being able to secure children during the trip (12 participants) and not being able to control them (3 participants). One pre-service teacher stated, "*My only reservation is that I am the sole responsible for all my students (Exp-2, F_3)"*. Another pre-service teacher said, *"We will teach secondary school students. Because they are very young, they will need to be protected, watched, and cared by an adult. It will not be easy to take this responsibility. (Exp-2, M_2)"*.

Another pre-service teacher stated, *"I don't think that we will have problems about organizing the trip, but safety will be the most difficult one for me. It is not that I will not manage the class but an accident or such a thing in the place where we visit scares me (Exp-3, F_4)"*. The importance of security and safety was highlighted by another pre-service teacher shared his opinion as follows: *"… Because the 8th graders are adolescents, they are generally difficult to control on the site and they are disobedient. I believe that I will fail to make myself heard. (Exp-3, F_5)"*.

Guidance (Code 4): It was also highlighted (see Table 8) that pre-service teachers have different concerns for guidance services during the trip. Some pre-service teachers determined the following concerns about the

ISSN 1648–3898 /Print/
ISSN 2538–7138 /Online/

guidance services: Lack of adequate care (2 participants), lack of providing enough guidance, lack of communication and interaction with the students (2 participants), not being able to provide student motivation at a high level (1 participant) and causing misconceptions while guiding students and giving wrong information (1 participant). Within this context, while one of the pre-service teachers answered the question like that: *"…. I may not have information about the place you showed to us in the lesson. That's why I 'm concerned that I may give incomplete or incorrect information about the trip site. Moreover, if we go on a trip with a crowded group, I think that I will not be able to take care of them and guide them adequately, so I hold back (Exp-2, M_3).* Another teacher said*, "I think that in general I am ready for a trip after working on it a lot. But, considering where we work as a teacher, we will take very young children to the trip. Because they are very young, we have to take care of them and take more responsibility. I have reservations only about this issue (Exp-2, M_4)"*.

One pre-service teacher stated, *"What makes me concerned is the quality of the guidance service which will be offered on the trip site. If I am the guide, there is no problem because I believe that I can do it but if the guide of the trip site is going to lead us, the guide's quality can cause a problem (Exp-3, M_3)".*

Still another pre-service teacher opined, *"I think there will not be a healthy communication between the students and the teacher and that's why I am concerned. Suppose that I started to work in a school and I could not establish a dialogue with the students and get to know them yet, so I would not like to take them on a trip immediately (Exp-1, M_6)"*. Moreover, while one of the pre-service teachers stated, *"…. It may be difficult to motivate students on the site. We will do activities related to the lesson and they can lose interest in the lesson and show interest in other things (Exp-1, M_7)"*, another pre-service teacher stated, *"I am a little concerned about giving wrong information to the students and causing misconceptions within them. I may have some reservations about giving wrong information or saying something wrong. In other words, I may be concerned about being inadequate in terms of qualifications (Exp-2, F_6)"*.

Purpose (Code 5): When the table was examined, it was found that during the visit the pre-service teachers had some concerns about achieving the goals of the trip. Two pre-service teachers stated that they were concerned about that the trip would not meet students' expectations and one pre-service teacher said that he was worried that the trip organized would not be able to meet the desired goals. One of the pre-service teachers stated it as follows, *"...expectations are important. For example, because we have a picnic, play ball games in the field trips which we have been to before, students' such expectations can concern me. The reason why I am concerned is that the trip may not reach its goal (Exp-1, F_4)"*.

Organization (Code 6): When the table was examined, it was considered that two of the pre-service teachers were concerned about not being able to meet the need on long trips. Within this context, while one of the pre-service teachers answered the question like that: *"…. My only concern is that I do not think that I can take the responsibility for the students during a 2-3day trip (Exp-3, F_7)". Another one said, "I think I can have difficulties on a 2-3day trip (Exp-3, F_8)".*

Discussion

The research reveals that experimental group-1 (η^2 =0.43) supported with visuals and offered theoretical information, experimental group-2 (η^2 =0.71) which were provided with theoretical information as well as in-class implementations, and experimental group-3 (η^2 =0.72) which package included theoretical information, as well as carrying out both in-class and out-of-class practices; have all significantly increased their knowledge levels about planning a curriculum-based field trip. Within this context, it can be deducted that course designs which were developed and supported by visuals and theoretical information have a positive effect on pre-service teachers' knowledge levels about planning a curriculum-based field trip. These results of the research are compatible with a research in the literature which reveals that enriched elective course content makes contributions to students' knowledge levels (Cole et. al., 2016). However, it is observed that the most effective course content belonged to the experimental group -1 where in-class implementations were carried out and experimental group-3 in which both in-class and out-of-class practices were performed. The course objectives can be attained if elective course designs are developed which requires students to be actively engaged as part of the facilitation process. Such designs not only encourage students to learn, but also promote their skills development (Li, Guo, & Yang, 2015). Several sources indicated that extra-curricular activities cost universities a lot of money (Carr, 2003; McKeown-Ice, 2000; Mc-Lure, 1999; Ritchie & Coughlan, 2004) and thus the directors reluctantly supported these activities (McKeown-Ice, 2000; Morag & Tal, 2012; Tal,

Bamberger & Morag, 2005). Based on the above, the alternative to curb expenses, appears to be providing pre-service teachers pedagogical knowledge about organizing a curriculum-based field trip supported with visuals, rather than mere theory. However, it seems that the best option would be to include field trips as part of the pre-service teachers' development.

Similarly, this research reveals that experimental group-1 (η^2 =0.26) which was provided with theoretical knowledge with the help of visuals within the course content, experimental group-2 (η^2 =0.44) which was provided with theoretical knowledge and carried out in-class implementations, and experimental group-3 (η^2 =0.74) which was provided with theoretical knowledge and carrying out both in-class and out-of-class practices all increased their self-efficacy beliefs significantly pertaining to planning a curriculum-based field trip. However, it is found that experimental group-3 with implementations both inside and outside the class was the most effective course rather than experimental group-2 and experimental group-1. Considering these results, it can be stated that in addition to in-class implementations, out-of-class implementations should be carried out so that pre-service teachers' self-efficacy beliefs about planning a curriculum-based field trip are at the highest level, because out-of-class implementations provide an opportunity for pre-service teachers to implement theoretical knowledge only and there self-efficacy was lower than the two other experimental groups. The findings of this research seem to concur with studies which indicated that enriching elective course content and using student-centred teaching methods promote students' interest and awareness of the course (Cole et. al., 2016) and develop their self-confidence positively (Gauthier, Sherman, & Unger, 2015; Hefferan, Heywood & Ritter, 2002).

Important findings were obtained from the focus-group interviews carried out with experimental groups. Pre-service science teachers in three experimental groups stated that although they had enough level of knowledge about the trip process at the end of the term and they felt themselves competent about organizing a trip, the conditions which they were most concerned about were the trip security and safety, as well as class management. What is interesting is that all of the pre-service teachers in experimental group-3 who participated in the interviews and improved most significantly in terms of knowledge scores and self-efficacy scores, also had concerns about trip security and safety. This result indicates that although pre-service teachers are given an opportunity to carry out both in-class and out-of-class practices, they will always have concerns about the security and safety risks. Research revealed that although teachers know that field trips to out of school settings will have positive impacts on learners, they do not prefer these activities because they are both pedagogically unqualified, they are not actively engaged in the process of trip, and they do not have any information about planning and organizing trips. (Bowker, 2004; Ferry, 1993; Kisiel 2003; Michie, 1998; McComas, 2001; Tal & Morag, 2009; Tal & Steiner 2006). The studies conducted reveal that not only teachers, but also prospective teachers do not have enough knowledge and experience regarding planning and organizing trips (Bozdoğan, 2012; Demir, 2007a; Wunder, 2002). Within this context, it is important that the risk factors in terms of security and safety about planning a trip to out-of-school settings must be determined and the actions should be taken to minimize these risks. Informing both teachers and pre-service teachers about this safety measures can encourage them to organize trips.

Another finding in the research is that the pre-service teachers who were interviewed had some concerns about the lack of guidance provided for students during the trip. Within this context, the pre-service teachers can be provided with opportunities at the schools where they receive internship about planning and organizing a field trip. This practise could become an opportunity for them to gain experience about how to communicate with secondary school students and manage the class during the trip. Especially, pre-service science teachers during the focus-group interviews stated that in addition to sub-problems of the research, they had information about a lot of out-of-school settings which they visited before, but they did not have enough information about the content such as natural monuments, national parks and planetariums in the presentations. Moreover, pre-service teachers stated that they would consider and evaluate such places they visited as potential sites for field trips. It is considered within this context that the presentations in the lessons have raised pre-service teachers' awareness related to out-of-school learning environments.

Conclusions

The results of the research reveal that the knowledge levels of the three experimental groups in which theoretical knowledge supported with visuals was presented, theoretical knowledge-in-class implementations

ISSN 1648–3898 /Print/
ISSN 2538–7138 /Online/

were carried out and theoretical knowledge-in-class-outside-class implementations were performed about organizing curriculum-based field trips increased significantly. However, the most effective course design was achieved with the experimental-2 and experimental-3 groups in which theoretical knowledge-in-class implementations and theoretical knowledge-in-class-outside-class implementations were carried out. Similarly, the results exhibit that organizing a curriculum-based field trip in the three experimental groups in which theoretical knowledge supported with visuals was presented, theoretical knowledge-in-class implementations and theoretical knowledge-in-class-outside-class implementations were performed, promoted self-efficacy belief scores significantly. However, it is observed that the most effective course design was achieved with the experimental-3 group in which theoretical knowledge-in-class-outside-class implementations were carried out. The focus group data revealed that although pre-service teachers considered themselves as proficient for organizing trips, they had some concerns about trip security and class management. It is interesting that all of the pre-service teachers in experimental group-3 who participated in the interviews and made progress in terms of knowledge scores and self-efficacy belief scores, also had concerns about these issues.

Considering science education and organizing trips to out-of-school settings, it is important to train self-confident and well-informed teachers. Thus, instead of offering theoretical knowledge to the pre-service teachers, having them perform extra-curricular activities will make contributions to train well-equipped teachers.

Recommendations

The content of the undergraduate courses and elective courses about organizing curriculum-based field trips should be designed and developed considering the needs of the students and goals of the courses. According to the results of the research, if the purpose is to organize a curriculum-based field trip based on knowledge, pre-service teachers do not need to do out-of-class practises. However, if the purpose is to have the pre-service teachers develop their self-efficacy beliefs, it is very important to carry out-of-school practices. In addition to this, during the process of planning a curriculum-based field trip, pre-service teachers might need the support of experts in the field to gain experience about security and safety related to the trip, as well as pertaining to class management. If these concerns are eliminated, the ratio of organizing trips in schools may increase. Moreover, the pre-service teachers in their final year of studies can be given a chance to practise the knowledge they have gained about organizing a trip in the schools where they do their internships under the supervision of their teachers. Thus, the pre-service teachers should be given opportunities to communicate with the students and guide them on the trip site to not only exhibit their practically acquired knowledge and skills, but also build experience.

There is need for multiple data for in-depth analysis of the effects of elective course content on the students taking the course. At that point, the data which will be gathered from different research groups including both teachers and pre-service teachers will make contributions to in-depth examination of the situation.

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ISSN 1648–3898 /Print/
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Appendix 1. Teaching packages and contents.

T.P.1	The researcher started his presentations supported with power point presentations, visuals (pictures, cartoons and etc) and videos within the context of the course. In this process, three experimental groups were presented the following titles: "What is out-of-school learning? What are the out-of-school learning environments? Why are field trips important? What is the importance of field trips for Science Education course? What is the relationship between out-of-school learning environments and science curriculum? What do you have to pay attention while organizing field trips? How are curriculum-based field trips planned? How is the process managed? What are the documents related to the process of organizing a curriculum-based field trip? At the end of this presentation, all of the pre-service teachers in experimental group-2 and experimental group-3 were asked to choose a place outside the school in the city where they live with their parents. They were asked to associate the place they chose to the subjects/ gains in science curriculum and also, they were asked to prepare the documents necessary for the curriculum-based field trip and present them considering the examples shown by the researcher in the lesson. Within this context, it was stated that pre-service teachers in both experimental groups were required to prepare one trip plan, one trip brochure, one worksheet which students were going to use during the trip, and one post trip evaluation sheet to be used after coming to school in order to determine whether or not the trip attained its goals.
T.P.2	The researcher focused on the museums and science centres supported by power point presentations and visuals in three of the experimental groups. Considering this content, the following topics were addressed: "What is a museum? What are the types of museums? Why are museums important for education? What is a science centre? What are the functions of a science centre? How did they develop historically? What are the important science centres in the world and Turkey? What are the research studies these centres carry out in terms of education? How can the exhibitions in science centres and science curriculum be associated to science curriculum? Watching the videos of TUBITAK (Scientific and Technological Research Council of Turkey) science centres. Showing an example of the process of curriculum-based science centre trip (Feza Gürsey Science Centre and Energy Park)".
T.P.3	The researcher mentioned zoos and aquariums as out-of-school settings. Within this context, in each of the three experimental groups the following topics are addressed: **"**What is a zoo and an aquarium? Why are these places important for education? How did they develop historically? What are the important zoos and aquariums in the world? What are the studies carried out by these places for education? How can the exhibitions in zoos and aquariums be associated to science curriculum? Showing the process of curriculum-based zoo trip as an example (Gaziantep Zoo). Showing the process of curriculum-based aquarium trip as an example (İstanbul Aquarium)".
T.P.4	The researcher discussed the planetariums. Within this context, in each of the three experimental groups the researcher presented the following topics: "What is a planetarium? Why are these places important for education? What are the functions of these places? How did they develop historically? What are the important planetariums in the world and Turkey? What did these places do for education? How can the planetariums be associated to science curriculum? Showing the process of curriculum-based planetarium trip as an example (Ondokuz Mayıs University Planetarium)".
T.P.5	The researcher talked about a botanical garden, national parks, and natural monuments? He presented the following topics in three of the experimental groups in his presentation supported with visuals: **"**What is a botanical garden, national park, and natural monument? What are the functions of a botanical garden, national park, and natural monument? How did they develop historically? What are the important botanical gardens, national parks, and natural monuments in the world and in Turkey? What do they do for education? How can the botanical gardens, national parks, and natural monuments be associated to science curriculum? Showing the process of curriculum-based botanical garden trip as an example (Batum Botanical Garden). Showing the process of curriculum-based natural park trip as an example (Kaçkar Mountains National Park). Showing the process of curriculum-based Natural Monument trip as an example (Karaca Cave)".
T.P.6	The researcher mentioned the following topics this week: "What is nature education? Examples and studies carried out in TUBITAK nature education camps".
T.P.7	The pre-service teachers in experimental group 2- and experimental group-3 performed their presentations. Each pre-service teacher' presentations lasted nearly 10 minutes. The documents which were necessary for a curriculum-based trip and asked by the researcher in the second week were presented by the pre-service teachers. Considering the cities where they lived with their families, experimental group-2 and experimentalgroup-3 prepared total 63 different trip contents about out-of-school settings for 31 cities out of 81 cities in Turkey. After the presentation of each pre-service teacher, the contents were evaluated in general and the deficiencies were revealed. It was stated that they would organize a curriculum-based trip for the pre-service teachers in Experimental group -3 to anywhere they wanted from the presentations.
T.P.8	A trip was organized to Ondokuz Mayıs University (OMU) Planetarium located in Samsun which was presented by a pre-service teacher in experimental group-3 living in Samsun in the 9th week as an in-class practise and also chosen by the pre-service teachers. A brochure and a trip plan related to the planetarium and the worksheets about Astronomy course which they took in their final term (8th term) and post-trip evaluation questions were used within this context. The practice outside the class was carried out in this planetarium which was nearly 220 km away and reached by a transportation vehicle provided by the university. All the participants in the trip were asked to read the brochure and answer the questions before the trip. They reached at 14.35 to the site of the trip, OMU Planetarium. A guide nearly gave 10-minute information about the structure of the planetarium and the organization in a hall outside the planetarium at 14.45. Then, another guide made nearly a 10-minute presentation including basic information about space and astronomy. After that, they went to the main hall where demonstrations with simulations were performed. In this saloon, a guide presented different information via visuals with the help of a computer and a projector. This presentation lasted nearly 15 minutes. Then, a video presentation explaining the solar system was carried out with the help of a projector. At the end of the presentation which nearly lasted 20 minutes, the participants left the hall. Outside the hall, a 10-minute information exchange was actualized by using question and answer format with the guide and the students were asked to fill in the worksheets. Then, students were given a 10-minute leisure time. At the end of the trip, photographs were taken collectively. After the trip which lasted nearly 1 hour and 15 minutes, they left the planetarium at 15.50.
T.P.9	The trip and planetarium visit carried out by the experimental group-3 were evaluated. Within this context, firstly, post-trip evaluation questions were answered. Then, positive and negative sides of the trip were discussed. And finally, the photographs taken were shared.

ISSN 1648–3898 /Print/
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Appendix 2. The frequency distribution of the pre-service teachers' responses to the question about how to plan a curriculum-based trip.

Processes	Groups	[1]C. Group		[2]Exp. Group-1		[3]Exp. Group-2		[4]Exp. **Group-3**	
		Pre test	Post test	Pre test	Post test	Pre test	Post test	Pre test	Post test
		f	f	f	f	f	f	f	f
Pre-trip	Educational Preparation								
	1. Deciding the trip site and collecting information	30	28	34	22	19	16	16	12
	2. Visiting the trip site before (if required)	2	5	4	10	1	3	4	13
	3. Finding a guide for the trip (if required)	4	5	2	5	1	9	4	7
	4. Determining the goal of the trip and associating the trip to the course/ learning outcomes	13	12	19	16	11	12	12	21
	5. Preparing the teaching documents for the trip (brochure work sheets, tests and etc)	5	5	1	25	3	28	1	28
	6. Informing the students about the trip	10	7	13	9	14	15	10	20
	Bureaucratic Procedures and Transportation								
	7. Getting the necessary permission (school, parents and etc)	20	24	17	27	21	31	13	28
	8. Making an appointment with the trip site	1	2	0	9	0	9	1	11
	9. 9.Preparing a trip plan	32	25	29	22	28	28	30	31
	10. Arranging the means of transportation (if required)	12	15	13	12	11	19	10	14
	Food and Beverage and Accommodation								
	11. Meeting the food and beverage and accommodation needs (if required)	3	6	10	21	11	31	8	27
During the trip	12. Informing the students on the trip site	25	27	14	15	22	19	23	16
	13. Guiding the students and having them discover knowledge	7	8	11	16	3	17	3	16
	14. Engaging students in participating actively without imposing great responsibility	1	1	5	4	2	6	3	4
	15. Providing learning with fun	10	9	5	8	8	3	4	5
	16. Providing social interaction and cooperation	3	1	3	2	2	2	2	5
	17. Keeping curiosity and motivation high	1	4	4	1	2	8	2	4
	18. Providing class management	18	18	21	13	30	21	26	19
	19. Providing leisure time activities considering their interests	2	2	0	11	2	14	3	10
	20. Making use of the teaching materials prepared	2	4	4	20	3	23	8	24
	21. Developing scientific process skills	1	1	1	1	1	1	2	6
Post-trip	22. Evalauting the trip (talk, discussion, question and answer and etc)	29	26	25	17	30	18	27	22
	23. Determining whether or not the trip reached its goals via assessment tools	8	10	10	31	7	28	4	29
	24. Writing a trip report and informing the necessary people/organizations about the results of the trip	3	4	7	11	3	11	0	11
	25. Exhibiting visuals of the trip on school bulletin boards	4	7	5	10	9	20	1	11
	26. Determining the problems and suggesting ideas for the next trip to be more effective	7	11	6	3	1	10	3	11
	Mean	7.66(0.18)		7.73(2.21)		7.65(4.85)		7.09(6.01)	

1N=33, Pre-test total frequency =253, Post- test total frequency =259; 2N=34, Pre-test total frequency =263, Post-test total frequency =338; 3N=32Pre-test total frequency =245, Post-test total frequency 400; 4 N=31, Pre-test total frequency =220, Post-test total frequency =406.

ISSN 1648–3898 /Print/
ISSN 2538–7138 /Online/

Appendix 3. Self-Efficacy Scale For Planning A Curriculum-Based Field Trip.

1	I have difficulty with guiding students on the out-of-school settings.
2	I have difficulty with having students answer the worksheets on the out-of-school settings.
3	I can make students engage in the activities actively and help them gain practical skills on the out-of-school settings.
4	During the trip, I can make students interact with each other socially.
5	I have difficulty in providing students with an opportunity for learning with fun.
6	Even if the number of students is high, I can achieve control on the trip field.
7	After the trip, I have difficulty with identifying whether or not the trip has reached its purpose.
8	I know the necessary steps to take while organizing a field trip to out-of-school settings.
9	I have difficulty with associating the whole trip site or the object(s) of focus with the course.
10	During the trip, I am not sure whether or not I will succeed in having the students gain concrete experiences.
11	I can develop students' critical thinking skills during the trip.
12	I think that I will not be able to determine the students' needs before the trip.
13	I have a complete belief in myself that I can approach the students positively and kindly.
14	I think that I will have difficulty with making a plan before the trip.
15	I have no difficulties with evaluating the trip with my students after the trip.
16	I have no difficulties with preparing the tools to be used during the trip.
17	I think that I will not be able to meet the accommodation needs of the students for the trips which last more than a day.
18	I believe that I can lead the students with different questions and help them reach information on the out-of-school settings.
19	I believe that I can easily organize a trip to out-of-school settings.
20	I can inform the necessary people before the trip.
21	I have difficulty with getting the necessary permission.
22	I may be incompetent for making the necessary explanations to the students before the trip.
23	I have difficulty with keeping students motivated on the out-of-school settings.
24	I can meet the students' nutritional needs for the trips which will last more than one day.
25	I have difficulty with exhibiting the photos taken during the trip on the school notice boards.
26	I can meet the need for the guidance before the trip.
27	I have no difficulties with informing the students' families about the trip.
28	I have no difficulties with making appointments (if there are any) on the trip field and informing the authorities on the out-of-school settings. .
29	I can suggest effective ideas and opinions for the future trips with the experience and information I have gained from the trip.
30	I think that I have enough experience to organize trips to out-of-school settings.

Received: *February 08, 2018* Accepted: *May 15, 2018*

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