



EXAMINATION OF THE EFFECTIVENESS OF NATURALISTIC TEACHING EDUCATION PROGRAM DEVELOPED FOR PRE-SCHOOL TEACHERS IN TURKEY

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Abstract

In the current study, face-to-face and web-based naturalistic teaching teacher education program for pre-school teachers (NTEPP), who are among the main stakeholders of inclusive education, was developed and examined its effectiveness on teacher outcomes (naturalistic teaching knowledge level, interactional behavior levels, and level of using naturalistic teaching strategies in the education processes). In addition, opinions the targeted teachers on the programs were gathered. A total of 30 teachers in the Face-to-Face (Experimental-1=14) and Web-based (Experimental-2=16) NTEPP groups participated in the study, which was designed with the "embedded design, one of the mixed research methods." In the study, face-to-face and web-based programs were found to be effective in increasing teachers' total scores for naturalistic teaching knowledge, interactional behaviors, and naturalistic teaching strategies used in leisure time and art activities. However, the results revealed that the face-to-face education program had a more permanent effect on the total scores for naturalistic teaching knowledge and naturalistic teaching strategies used in leisure time activities compared to the web-based program. Accordingly, it was determined that web-based programs, the contents of which were designed with visual and written materials, could be as effective as face-to-face programs on teachers' targeted performance levels. Finally, it was observed that teachers' opinions on the programs were quite positive.

Keywords: Inclusive education, inclusive pre-school education, naturalistic teaching approach, professional development.

INTRODUCTION

Naturalistic teaching is defined as an approach/process in which teaching is embedded in the natural daily lives of children (e.g., daily routine, activities and transitions for school and home settings; Charlop-Christy, LeBlanc, and Carpenter, 1999; Halle, Albert, and Anderson, 1984; Koegel, O'Dell, and Koegel, 1987). This approach is an "evidence-based" practice and is based on "developmentally appropriate principles" (National Professional Development Center [NPDC], 2014; National Autism Center [NAC], 2015). This approach has increasingly become important in inclusive pre-school education in recent years in that it can be easily implemented without disrupting the education process, includes appropriate principles for child development, and ensures the easy reinforcement and generalization of skills and behaviors (Allen & Cowan, 2008; Dunst, Raab, & Trivette, 2011; McWilliam, 2016; Rakap, 2019; Rakap & Parlak-Rakap, 2011). According to the results of studies, the lack of knowledge and education of teachers is among the main systemic problems experienced in the inclusive pre-school education and that the naturalistic teaching approach is among the key issues



on which knowledge and education are needed (Bruder, 2016; Sucuoğlu, Bakkaloğlu, İşçen-Karasu, Demir, & Akalın, 2013). Therefore, especially in recent years, in order to eliminate their lack of knowledge and education in the process, researchers aimed to develop programs including the teaching of evidence-based practices such as naturalistic teaching to pre-school teachers in inclusive education (Aldemir, 2017; Dick, 2017; Rakap, 2019; Storie, Grygas-Coogle, Rahn, & Riggie-Ottley, 2017; Ünal, 2018).

In recent years, it has begun to be discussed which components and presentation forms should and to what the content of teacher education programs should be prepared (Bruder, 2016). In fact, “face-to-face” education programs that were called as traditional methods in the early years have been replaced by different forms of presentation such as “web-based programs”. In addition, education programs have turned into “multi-component” programs supported by several ways such as coaching, counseling, and providing feedback on performance (Aldemir, 2017; Dick, 2017; Gianoumis, Seiverling, & Sturmey, 2012; Harjusola-Webb, & Hess Robbins, 2012; Pianta, Mashburn, Downer, Hamre, & Justice, 2008; Tate, Thompson, & McKerchar, 2005; Ünal, 2018). In this context, web-based programs, which are independent of time and space, can be followed individually and can spread all over the countries, have increasingly gained momentum (Storie et al., 2017; Ünal, 2018). Moreover, “web-based education programs,” an alternative education approach, have been becoming more important since the education and training process is being conducted at home due to the COVID-19 pandemic, and in such cases that may occur later. At this point, the contents of these programs designed in different ways have also started to be supported with many different visual and written materials (Dick, 2017; Harjusola et al., 2012; Rakap, 2019). Furthermore, although the effects of these programs designed with different forms of presentation and various materials on targeted teacher behaviors have been compared in recent studies, which practices are more “maintained”, “efficient” and “useful/functional” has started to be discussed (e.g., Dick, 2017; Frantz, 2017; Rakap, 2019; Stahmer, Rieth, Lee, Reisinger, Mandell, & Connell, 2015; Ünal, 2018). However, both in the international literature and Turkish literature, there is no study in which natural teaching strategies, methods and techniques were used as a “package teacher training program” with guidebooks, expert and sample application videos, and the effect of this package program has been examined. Furthermore, there is no study compare the effectiveness and maintenance of the naturalistic teaching teacher education program which was developed with two different presentation styles (face-to-face and web-based), with the data obtained from many quantitative and qualitative data collection procedures. Such a study can be a guide for how pre-school teachers in inclusive education will be able to improve their professional skills with regard to evidence-based practices such as naturalistic teaching in the best way. In addition, this study may contribute to the development of quality processes in inclusive pre-school education institutions. The aim of the current study was to develop to evaluate the effectiveness of a “*Face-to-Face and Web-based Pre-School Naturalistic Teaching Teacher Education Program (NTEPP)*” for pre-school teachers in inclusive education in Turkey. In line with this aim, answers to the following research questions were sought:

1. What are the opinions of pre-school teachers regarding their knowledge and experience in inclusive education and the naturalistic teaching process?
2. Is there a significant difference between the total scores for naturalistic teaching knowledge of pre-school teachers in inclusive education, who participated in the Face-to-Face NTEPP (Experimental-1 group) and Web-based NTEPP (Experimental-2 group), in the pre-test, post-test and follow-up measurements in-group and between-group?
3. Is there a significant difference between the total scores for interactional behaviors of pre-school teachers in inclusive education, who participated in the Face-to-Face NTEPP (Experimental-1 group) and Web-based NTEPP (Experimental-2 group), in the pre-test, post-test and follow-up measurements in-group and between-group?
4. Is there a significant difference between the total scores for naturalistic teaching strategies used in the classrooms of pre-school teachers in inclusive education, who participated in the



- Face-to-Face NTEPP (Experimental-1 group) and Web-based NTEPP (Experimental-2 group), in the pre-test, post-test and follow-up measurements in-group and between-group?
5. What are the opinions of pre-school teachers in inclusive education about the NTEPP (social validity) offered in two different ways: face-to-face and web-based?

METHOD

Research Design

This study was designed with the "embedded design, one of the mixed research methods." This study was based on a quasi-experimental process. The qualitative data collection techniques were embedded in this process to support and diversify quantitative data (e.g., focus group interviews), and thus, multi quantitative and qualitative data were collected simultaneously in the process. The formulized expression of the research method is Quantitative (+qualitative) (Cresswell, 2011; 2014; Morse, 1991). The embedded design scheme of the study is presented in Figure 1.

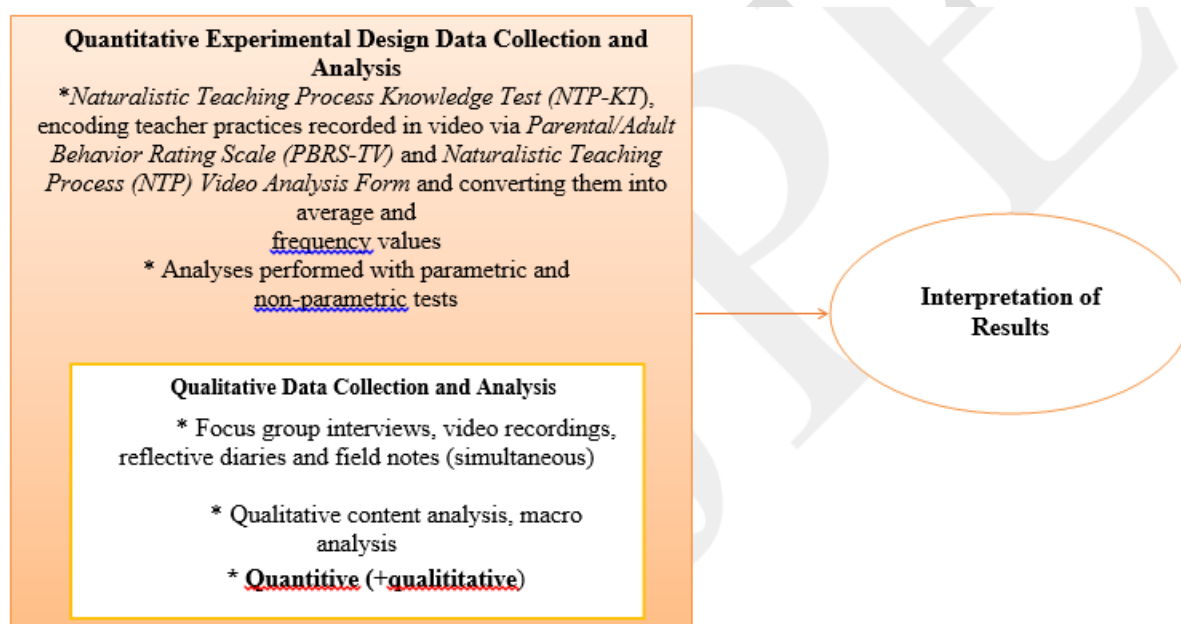


Figure 1. The embedded design scheme of the study (adapted to study from Creswell, 2011, p. 541.)

The research process, the visual of which is presented in Figure 1, can be summarized as follows: Focus group interviews were conducted with the participants before and after the implementation of the education programs. In the pre-implementation interviews, the prior knowledge, opinions and experiences of the participants regarding inclusive education and naturalistic teaching practices were determined, and the need for education programs was revealed. In the post-implementation interviews, experience, opinions, suggestions regarding the completed education programs were received; thus, social validity data were also obtained. Simultaneously with this process, the participants' naturalistic teaching knowledge levels were measured with NTP-KT in three different measurements consisting of pre-test, post-test and follow-up, and the practices they performed in their classrooms were video-recorded in two different activities, leisure time and art activities. During the implementation of the programs, data were collected through weekly reflective diaries related to the participants' experiences on naturalistic teaching practices in the education processes. Furthermore, quantitative log records were kept for the Web-based NTEPP participants' duration of following the programs. Moreover, the researcher took field notes and wrote his observations on the whole process. In the data analysis stage, all quantitative and qualitative data collected were analyzed separately and integrated in the writing of results.



Participants and the Setting

A total of 30 pre-school teachers (Experimental-1=14, Experimental-2=16), who were working in two independent kindergartens in Eskişehir province in Turkey and were involved in the inclusive education process, constituted the participants of the study. In the follow-up sessions of the study, one teacher was appointed to another school within the province. Therefore, follow-up data could not be collected from one participant. Consequently, the pre-test measurement of the study included 30 individuals, the post-test measurement included 30 individuals, and the follow-up measurement included 29 individuals.

Table 1a. Descriptive statistics on the demographic characteristics of the participants (n_{total}=30)

Group	Variables	f	%
Experimental-1 (Face-to-Face NTEPP) N=14	Age Group Provided with Education (Mean=4.36, Std.Dev.=.745)		
	3-4 years	2	14.3
	4-5 years	5	35.7
	5-6 years	7	50.0
	Professional Seniority (Mean=8.57, Std.Dev.=3.251)		
	4 years	1	7.1
	5 years	2	14.3
	7 years	2	14.3
	8 years	2	14.3
	9 years	3	21.4
	10 years	1	7.1
	11 years	2	14.3
	17 years	1	7.1
	Inclusive Education Experience (Mean=5.29, Std.Dev.=4.375)		
	2 years	5	35.7
	3 years	1	7.1
	4 years	3	21.4
	6 years	2	14.3
	9 years	1	7.1
	11 years	1	7.1
	17 years	1	7.1
	Number of Students Involved in Inclusive Education		
	0 student	3	21.4
	1 student	8	57.1
	2 students	2	14.3
	3 students	1	7.1
	Diagnoses of Students Involved in Inclusive Education		
	ASD	8	57.1
	Speech and Language Disorder	2	14.3
	Visual Disability	1	7.1
Number of Undiagnosed Students with Special Needs			
1 student	11	78.6	
2 students	3	21.4	
Types of Developmental Disabilities in Classrooms			
Language and Speech Disorder	10	71.4	
ADHD	3	21.4	
Disability in Social Skills	1	7.1	
Seminars Received			
Special Education Seminar	8	57.1	
Teaching with Simultaneous Prompting	1	7.1	

f: Frequency, %: Percentage values, ASD: Autism Spectrum Disorder, ADHD: Attention Deficit and Hyperactivity Disorder



Table 1b. Descriptive statistics on the demographic characteristics of the participants (n_{total}=30)

Group	Variables	f	%
Experimental -2 (Web-based NTEPP) N=16	Age Group Provided with Education (Mean=4.19, Std.Dev.=.750)		
	3-4 years	3	18.8
	4-5 years	7	43.8
	5-6 years	6	37.5
	Professional Seniority (Mean=10.63, Std.Dev.=4.097)		
	5 years	2	12.5
	6 years	2	12.5
	8 years	2	12.5
	9 years	1	6.3
	11 years	2	12.5
	12 years	2	12.5
	14 years	2	12.5
	15 years	1	6.3
	16 years	1	6.3
	18 years	1	6.3
	Inclusive Education Experience (Mean=5.81, Std.Dev.=5.115)		
	1 year	2	12.5
	2 years	6	37.5
	5 years	2	12.5
	6 years	1	6.3
	10 years	2	12.5
	13 years	1	6.3
	14 years	1	6.3
	16 years	1	6.3
	Number of Students Involved in Inclusive Education		
	0 student	7	43.8
	1 student	8	50.0
	2 students	1	6.3
Diagnoses of Students Involved in Inclusive Education			
ASD	4	25.0	
Speech and Language Disorder	2	12.5	
Mental+Visual Disability	1	6.3	
Physical Disability	1	6.3	
Cerebral Palsy	1	6.3	
Number of Undiagnosed Students with Special Needs			
0 student	4	25.0	
1 student	8	50.0	
2 students	4	25.0	
Types of Developmental Disabilities in Classrooms			
Speech and Language Disorder	9	56.3	
Learning Disability	1	6.3	
ADHD	1	6.3	
Disability in Social Skills	1	6.3	
Seminars Received			
Special Education Seminar	9	56.3	

f: Frequency, %: Percentage values, ASD: Autism Spectrum Disorder, ADHD: Attention Deficit and Hyperactivity Disorder

While determining the participants, prerequisite features were first determined, and then, the Eskişehir Odunpazarı Counseling and Research Center (CRC) was contacted. Thus, the numbers of independent kindergartens affiliated to Odunpazarı district in the city center, pre-school teachers working in these schools, students with special needs and undiagnosed developmental disabilities in inclusive education were reached. Face-to-face interviews were conducted with kindergarten principals and the list of schools and teachers volunteering to participate in the study was prepared. The conditions of voluntary schools such as the numbers of classrooms and students with special needs and undiagnosed developmental disabilities in inclusive education were evaluated. At the end of the process, two schools with higher numbers of classrooms and students with special needs and undiagnosed developmental disabilities in the inclusive education process compared to other schools were selected



to collect a large number of quantitative and qualitative data in a valid and reliable manner. In the final step, these two schools were randomly assigned to the Experimental-1 and Experimental-2 groups. The prerequisite features required in the selection of the participants are listed below, and the demographic characteristics of the participants are presented in Table 1a, Table 1b.

- Working as a pre-school teacher in kindergartens,
- The kindergartens, where the participants work, are located in the same socio-economic region,
- The presence of students with diagnosed with developmental disabilities or undiagnosed (students with typical development) involved in the inclusive education process in the classrooms of the participants,
- Participants' non-participation in any in-service training on naturalistic teaching,
- The presence of internet connection of Web-based NTEPP participants at their homes and schools,
- Web-based NTEPP participants' possession of skills to use information and communication technologies.

The characteristics of the study setting are as follows: The schools, where teachers in the Experimental-1 and Experimental-2 groups work, are both in an environment with a mild-socio-economic level. While the Experimental-1 group school consisted of 14 classrooms, including 7 morning classrooms and 7 afternoon classrooms, the Experimental-2 group school consisted of 15 classrooms, including 7 morning classrooms and 9 afternoon classrooms. In the classrooms, there are basic learning centers such as block, playing house, book corner included in the Preschool Education Program. The size of each class varied between 15 and 25. While the daily course of education of the Pre-school Education Program is flexible by its nature, the half-day education course is conducted in schools within the scope of the basic draft program in Table 2.

Table 2. Half-day education courses of pre-schools

List of Sequentially Functioning Activities of the Morning and Afternoon Groups

Time of Free Play (Start Time of Day)
Gathering and Cleaning
Breakfast Time
Gathering and Cleaning
Art Activity
Reading-Writing/Science and Nature/Experiment/Game and Music Activities
General Evaluation of the Day, Gathering Time, Preparations for Going Home

Dependent Variable

In the study, the effectiveness of the Face-to-Face and Web-based NTEPP on multiple dependent variables was tested. Dependent variables were the participants' naturalistic teaching knowledge level, interactional behavior levels, and level of using naturalistic teaching strategies in their classrooms.

Data Collection Tools

In this study, many quantitative and qualitative data collection tools were used.

Quantitative Data Collection Tools

Naturalistic Teaching Process Knowledge Test (NTP-KT): Pre-test, post-test and follow-up measurements of pre-school teachers' naturalistic teaching knowledge levels were measured with "Natural Teaching Process Knowledge Test (NTP-KT)". The NTP-KT is a knowledge test prepared in cooperation with the The Scientific and Technological Research Council of Turkey 1001 project team under the leadership of the first author. This knowledge test contains information, definitions, and case study questions. It consists of 58 questions and can be solved in an average of 70 minutes. Each item of the test consists of five options, and these options include a correct answer. The lowest and highest scores to be obtained from the test are 0 and 58, respectively. The increase in the scores obtained from the test indicates an increase in natural teaching knowledge levels, and the decrease in the scores indicates a decrease in the knowledge levels.



The steps of "determining the scope of the test," "determining target behaviors," "writing questions and placing them in the table of signs," "arrangement of test questions," "implementation and scoring of the test," "performing validity and reliability studies and finalizing the test as a result of the analyses" were conducted, respectively, while preparing the knowledge test (Şeker & Gençdoğan, 2006). During these steps, the following studies were conducted: The content/scope of this test is parallel to the content of education programs and contains the topics of "Definition and Characteristics of the Types of Developmental Disabilities," "Naturalistic Teaching Process," "Qualified Adult-Child Interaction Strategies," "Naturalistic Teaching Strategies," and "Environmental Arrangements." The "Renewed Bloom's Taxonomy of the Cognitive Domain" consisting of "remembering, understanding, applying, analyzing, evaluating and creating" dimensions was used to measure which target behaviors pre-school teachers gained after the education programs (Bloom, 2001). The opinions of two domain experts were consulted for the content and face validity of the questions, and the questions were rearranged in line with these opinions. Item analyses were performed for item discriminant validity. In this context, 27% sub-super groups were determined from the data obtained from the participants' responses to the test items, and the differences between the items mean scores were tested using the independent samples t-test. The test items that were found to have low discrimination were excluded from the test.

Parental/Adult Behavior Rating Scale (PBRSTV): In the pretest, posttest and follow-up measurements, the levels of interactional behaviors established by pre-school teachers with children were evaluated by the PBRSTV. This scale, which was developed and used by Gerald Mahoney was also used with teachers under the name of the Maternal Behaviors Rating Scale (MBRS) in 2008, aims to measure the levels of interactional behaviors established by adults with children in the play setting. The validity and reliability studies of the scale in Turkey were performed with 123 mother-child dyads by Diken, Topbaş, and Diken (2009). The PBRSTV consists of three subscales, including "Sensitivity-Responsivity," "Affect-Expressiveness," and "Achievement-Orientation." There is a total of 12 items under three subscales. These items are *being sensitive, being responsive, being effective, and being creative* in the subscale of "Sensitivity-Responsivity" and *acceptance, enjoyment, using verbal reinforcers, being warm, and being emotionally expressive* in the subscale of "Affect-Expressiveness." The "Achievement-Orientation and Directiveness" subscale includes the items of *being achievement-oriented, directive, and interaction pace* (Diken, Topbaş, & Diken, 2009).

Naturalistic Teaching Process (NTP) Video Analysis Form: The intended use of the form is to watch participants' videos containing their leisure time and art activities during the pre-test, post-test and follow-up measurements, and to write the naturalistic teaching strategies used in the activities watched on the form and to convert them into total frequency values. In the preparation of the form, the strategies to be included in the form and the formal structure of the form were first determined by a detailed literature review. The strategies, methods, and techniques to be included in the form are parallel with the content of the education programs developed in the study, and its physical structure includes the sections in which explanations about the implementation process of the strategies (start and end time intervals, context and transcriptions of the strategies used by teachers in classrooms), and the observations in the video recording will be written. This form was designed to get total scores/frequencies from the main/basic strategies because naturalistic teaching strategies are an integrated process consisting of many sub-methods and techniques. Thus, by avoiding performing many different tests on the many methods and techniques included in the main/basic strategies, it was attempted to prevent results from becoming complicated and to prevent the study from moving away from its aim. Finally, the opinions of two domain experts were obtained for the content and formal structure of the form, then, the form was rearranged in line with these opinions, and a pilot study was carried out on whether the form worked or not by watching five videos of teachers' activities.

Log Records: "Access log records" were used to determine the number and time of displaying the education site and guide resources of the Web-based NTEPP participants.



Qualitative Data Collection Tools

Focus Group Interviews: The prior knowledge, opinions, and experiences of the participants regarding inclusive education and the naturalistic teaching process were determined before the implementation, and their opinions and experiences regarding the programs were determined through focus group interviews after the implementation. The reason for selecting this type of interview was to obtain participants' opinions that emerged interactively in depth and to understand and describe them (Kruger & Casey, 2000; Patton, 2002).

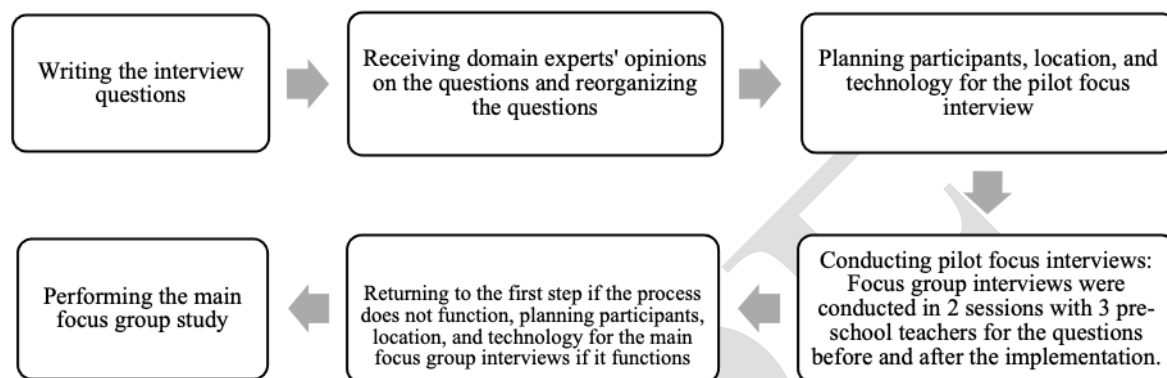


Figure 2. The preparation process for focus group interviews

It is necessary to make some preparations before conducting focus group interviews (Kruger and Casey, 2000; Patton, 2002). These preparations and the steps followed are presented in Figure 2. As a result of the preparation process, *pre-implementation focus group interview questions* consisted of three basic topics including "students with special needs and their characteristics," "inclusive pre-school education experiences," and "practices carried out in the daily education process," and *post-implementation focus group interview questions* consisted of three basic topics including "content and implementation processes," "contributions," and "aspects requiring improvement" of the education programs.

Video Recordings: Videos were collected to evaluate the naturalistic teaching strategies used by the participants in leisure time (an unstructured activity) and art activities (a structured activity) at three different times (pre-test=30, post-test=30, follow-up=30, a total of 178 videos). These activities were selected because leisure time was the most important unstructured activity in pre-school education programs, and the participants included structured art activities in their daily plans almost every day. Leisure time activities were recorded for approximately 10-15/20 minutes, and art activities were recorded until the end of the activities because it is indicated in the literature that interactional behaviors can be analyzed by recording them for an average of 15-20 minutes, and it is possible to get an impression on free play times during this period (Karaaslan and Mahoney, 2013; Karaaslan, Diken and Mahoney, 2013; Mahoney and Perales, 2003). The interruption of art activities that were carried out as a whole, during video shoots was not found appropriate by domain experts. The videos recorded enabled the authors to check the codings they made by watching videos repeatedly and to perform reliability studies. All video recording data were written on the "NTP Video Analysis Form" and used to convert them into total frequency values.

Naturalistic Teaching Process (NTP) Reflective Diary Form: Participants' experiences of participating in weekly education programs were collected through the "NTP Reflective Diary Form." This form is a semi-structured document prepared by the researcher. The reason for this was that teachers did not have the experience and time to write a reflective diary every week and that data could be collected from teachers in a focused and easy way. In the preparation stage, face and content validity studies were performed by receiving the opinions of two domain experts. The content of the form included questions about "knowledge gained from education on a weekly basis," "reflecting the knowledge gained to the class/implementing it in the class," and "the contributions of knowledge to students."



Field Notes: The researcher wrote down everything she observed during the whole process and took field notes. She used these data to support and diversify the results of the study.

Independent Variable and Research Process

The independent variables of the study were the Face-to-Face and Web-based NTEPP. The Face-to-Face and Web-based NTEPP are five-week teacher education programs. The contents of the education programs, which were in parallel with each other, were presented to the Experimental-1 group through face-to-face sessions conducted by the researcher and to the Experimental-2 group through the website. Nevertheless, this study consisted of five basic stages: preparation, pre-test, implementation, post-test, and follow-up. All of these stages are presented in Figure 3, and the process of developing education programs that constituted the basis of the study is explained in the next section.

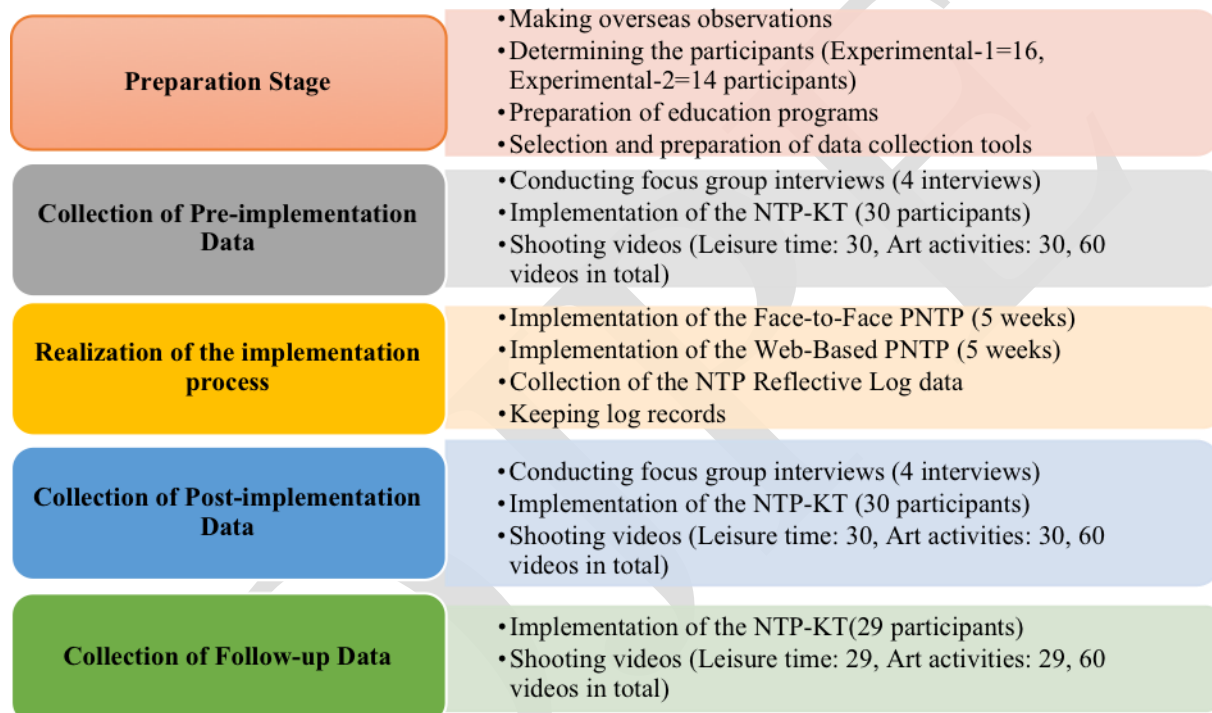


Figure 3. Research Process

Development Process of the Education Programs

The program development model used in the development process of the education programs is the TABA Model (Ornstein & Hunkins, 2008). This model consists of the basic steps of determining the need for an education program through pre-implementation focus group interviews, determining general and special objectives, creating the program content, and implementing and evaluating the program based on the "deductive approach." The content of the program consisted of the following 5-week content with the data obtained from a detailed literature review and focus group interviews:

1. Definition and Characteristics of the Types of Developmental Disabilities (Intellectual Disability, Down Syndrome, Hearing Disability, Visual Disability, Speech and Language Disorder, Autism Spectrum Disorder, Attention Deficit and Hyperactivity Disorder, Cerebral Palsy)
2. Introduction to the Naturalistic Teaching Process
3. Qualified Adult Behavior Strategies
 - 3.1. Being Sensitive-Responsive (Being Sensitive, Being Responsive, Being Effective, Being Creative)
 - 3.2. Being Emotionally Expressive (Acceptance, Enjoyment, Being Warm, Using Verbal Reinforcers)



- 3.3. Being Achievement-Oriented-Directive (Being Achievement-Oriented, Being Directive, Interaction Pace)
4. Naturalistic Teaching Strategies
 - 4.1. Modeling
 - 4.1.1. Modeling without Expecting a Response
 - 4.1.1.1. Bombardment of Words
 - 4.1.1.2. Parallel Speech
 - 4.1.1.3. Self-speech
 - 4.1.2. Making choice
 - 4.1.3. Modeling by using expansion
 - 4.1.3.1. Expansion by adding words
 - 4.1.3.2. Expansion by correcting/displacing
 - 4.1.4. Mand-modeling
5. Environmental Arrangements (Making Inaccessible, Leaving Missing, Giving Limitedly/In Pieces, Creating Surprising/Unexpected Conditions)

The Face-to-Face and Web-Based NTEPP consists of various basic tools and materials. They are five guide booklets prepared based on the topics in the content, and 221 expert and sample application videos. These tools and materials were embedded in a website in the Web-Based NTEPP, and all the contents of these tools and materials were embedded in PowerPoint presentations and presented to the participants through face-to-face sessions in the Face-to-Face NTEPP. The website of the program can be accessed at <https://www.dogalogretimprojesi.com/>

Analysis of Data

The frequency and average values obtained by encoding the NTP-KT and all recorded videos in the pre-implementation, post-implementation and follow-up measurements through the PBRs-TV and NTP Video Analysis Form were analyzed by parametric and non-parametric tests. The analyses were performed on the total scores obtained from three different measurements. The normal distribution condition of each data set was evaluated before deciding on the tests to be performed. In this context, kurtosis and skewness values, graphical methods (histogram, box plot diagram, stem-leaf diagram, Q-Q graph and P-P graph, etc.) and statistical tests (Kolmogorov-Smirnov and Shapiro-Wilk tests, etc. compliance tests) were used (Huck, 2008; Pallant, 2011; Tabacknick & Fidell, 2007). All focus group interviews were analyzed by content analysis (inductive thematic analysis) method, and then all related results were combined. The content analysis allowed the researcher to interpret the data by creating themes within the data (Patton, 2002). The qualitative data obtained from reflective diaries and field notes that were analyzed by the macro analysis method, which provides a holistic and wide view of a lot of data, played a supportive role for all results (Patton, 2002).

Reliability and Validity Studies

The “*Inter-Observer Reliability*” data were collected on whether the total score, average and frequency values calculated for the dependent variables of the study (naturalistic teaching knowledge level, interactional behavior levels, and levels of naturalistic teaching strategies used in classrooms) were correct, and the “*Implementation Reliability*” data were collected to determine whether the independent variables (education programs) were implemented as planned. These data calculated using the formula of “ $\text{Consensus} / (\text{Consensus} + \text{Dissensus}) \times 100$ ” ranged from 85.8% to 98.6%. In the *validity studies*, while time, external factors, measurement/testing before the experiment, separate measurement tools and testing, biased grouping and the loss of participants were considered to ensure the internal validity of quantitative data, measurement-independent variable interaction, biased selection-independent variable interaction, test response interaction of independent variables (Karasar, 2011) were considered for external validity. Long-term interaction, depth-oriented data collection, triangulation, expert review, participant confirmation and contrast case analysis factors were taken into account in the internal validity of qualitative data, and detailed description and detailed sampling factors were taken into account in their external validity (Daymon & Halloway, 2010; Patton, 2002).



Research Ethics

The ethical considerations that were considered during the research process were as follows: Obtaining the necessary permissions, protection of the confidentiality of the participants' identities, non-corruption of the nature of the place investigated, respecting the institution/school culture, clear transfer of research aims to the participants, respecting the groups with sensitivity to various situations (inclusive students, etc.), being aware of possible hierarchical power relations in the data collection process (relations between the researcher-school principals and teachers, etc.), and informing the participants about the results of the study (Cresswell, 2011).

RESULTS

By the nature of the mixed research method, the results were presented in a supportive and integrated manner. The results are explained by the order of the research questions.

Determination of the Participants' Knowledge, Opinions, and Experiences Regarding Inclusive Education and the Naturalistic Teaching Process before the Implementation

Four main themes and ten sub-themes were reached by inductive analysis from the data obtained from the focus group interviews before the implementation. All themes are presented in Figure 4, and then these themes are explained in paragraphs.

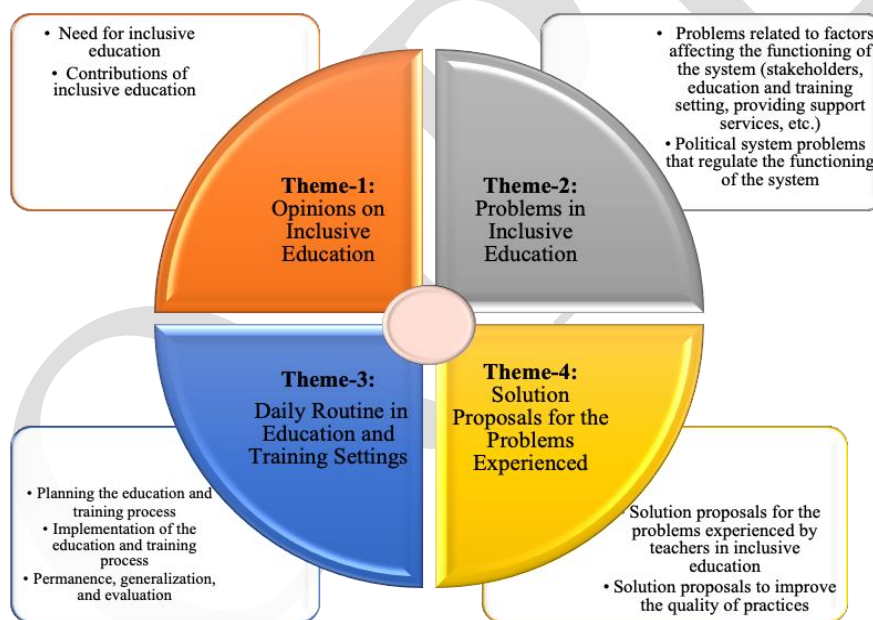


Figure 4. List of themes and sub-themes resulting from the analysis of focus group interviews before the implementation

During the interviews, it was observed that the vast majority of the participants emphasized that inclusive education, which is a legal right in international and national legislation and plays a significant role in the acceptance of individual differences, is a system that should be present in Turkey. In addition to the need for inclusive education, the participants also mentioned many contributions of inclusive education to students, families, teachers, and peers. In the analysis, it was found that the emphasis was placed, especially on “recognizing and accepting differences” within the context of contributions. The teachers emphasized that they play a unique role in ensuring the social acceptance of students with special needs and that their acceptance of students with special needs quickly reaches other individuals (students, families, etc.) included in inclusive education by creating a snowball effect. According to the opinions of the participants who described themselves with the metaphor “*We are not Superman!*” in the theme of the problems experienced, their lack of knowledge about approaches/methods such as naturalistic teaching was addressed as one of the main

problems in conducting the inclusive education process. According to the opinions, this lack of knowledge and education is attempted to be solved through individual efforts. It was considered that it was difficult, even impossible, to overcome the lack of methodological knowledge in this way. Furthermore, these studies based on individual efforts lead to a significant loss of time and occupational burnout, which makes the acceptance of students with special needs difficult, and this behavior may adversely affect the perspectives of other stakeholders (students, students' families, etc.) in the system towards students in inclusive education. In the theme of teachers' solution proposals for the problems, the need for preparing education programs on approaches/methods such as naturalistic teaching should be among primary suggestions. Thus, the atmosphere of the class will be positively affected, and the social acceptance of students with special needs in the classroom and other settings will become easier, which may result in the happiness of all stakeholders with the process. In line with these results, it is observed that the need referring to the subject of the study was also revealed. The summarized visual of all these issues associated with each other is presented in Figure 5.

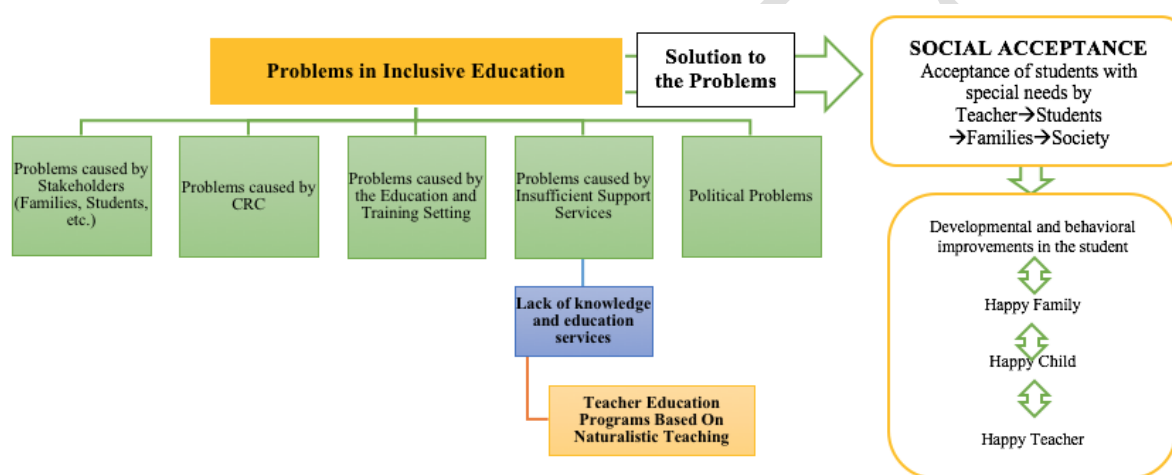


Figure 5. Issues associated with the main theme of problems in inclusive education

Effect of the Education Programs on the Participants' Naturalistic Teaching Knowledge Levels

The 3x2 mixed-design ANOVA (split-plot design ANOVA) test was performed to determine whether the interactions of the measurement time, group, measurement time, and group factors, which are the variables of the study, led to a significant difference in the participants' total scores for the NTP-KT. The descriptive results related to mean, standard deviation, minimum and maximum values of the total scores of the groups included in the analysis are presented in Table 3, and the results of the mixed design ANOVA analysis are presented in Table 4.

Table 3. Descriptive statistics related to the total scores for the NTP-KT of the Experimental-1 and Experimental-2 groups

Group	Measurement Time	N	Mean	SD	Minimum	Maximum
Experimental-1 Face-to-Face NTEPP	Pre-test	14	40.714	3.851	36.00	47.00
	Post-test	14	49.928	5.327	41.00	57.00
	Follow-up	14	47.574	4.569	40.00	55.00
Experimental-2 Web-Based NTEPP	Pre-test	16	41.687	4.269	32.00	49.00
	Post-test	16	47.312	3.772	39.00	53.00
	Follow-up	15	43.800	3.648	38.00	52.00

SD: Standard deviation, N: Number of People

According to the descriptive statistics, results revealed that the total mean scores for the NTP-KT of the Experimental-1 and Experimental-2 groups increased from pre-test to post-test and decreased from post-test to follow-up.

**Table 4.** Mixed Design ANOVA Results of the pre-test/post-test/follow-up total scores for the NTP-KT of the Experimental-1 and Experimental-2 groups

Source of Variance	SS	df	MS	F	p	η^2
Intergroup						
Group	74.287	1	74.287	2.064	.162	
Error	971.897	27	35.996			
Intragroup						
Measurement time	771.869	2	385.934	40.306	.000*	.599
Measurement*group	96.558	2	48.279	5.042	.010*	.157
Error	517.051	54				
Total	1.914,611	32				

* $p < .05$, SS: Sum of Squares, df: Degree of freedom, MS: Mean of Squares, η^2 = Partial Effect Size

When the ANOVA summary chart was examined, it was observed that the change in the total mean scores for the NTP-KT in the pre-test, post-test, and follow-up measurements did not differ by groups ($F_{(1,27)}=2.064$, $p > .05$). This result can be interpreted that changes in the groups at different measurement times were similar. Furthermore, a significant difference was found between the mean scores for the NTP-KT in the repeated measurements of the participants, regardless of the groups ($F_{(2,54)}=40.306$; $p < .05$; $\eta^2=.599$). According to Cohen (1988) and Huck (2008), while an effect size value of .01-.06 refers to a small effect, a value of .06 and above refers to a medium effect, and a value of 0.14 and above refers to a large effect. Accordingly, it can be said that the measurement time, in other words, both education programs had a large effect on the participants' scores for the NTP-KT. Finally, it was determined that the measurement time and group interaction were statistically significant and had a significant effect on the participants' scores for the NTP-KT ($F_{(2,54)}=5.042$; $p < .05$; $\eta^2=.157$). This result can be interpreted that participation in the face-to-face and web-based programs had different effects on the participants' total scores for the NTP-KT in at least one of the three measurement times.

A series of independent samples t-tests were performed to determine whether there was a significant difference in the total mean scores for the NTP-KT in each measurement between the groups. All results of the analyses are presented in Table 5.

Table 5. Independent samples t-test results in which the total scores for the NTP-KT obtained from three measurements were examined by groups

Measurement Time	Group	N	Mean	SD	df	t	p	η^2
Pre-test	Experimental-1	14	40.714	3.851	28	-.652	.520	-
	Experimental-2	16	41.684	4.269				
Post-test	Experimental-1	14	49.928	5.327	28	1.567	.128	-
	Experimental-2	16	47.312	3.772				
Follow-up	Experimental-1	14	47.571	4.569	27	2.465	.020*	.183
	Experimental-2	15	43.800	3.648				

Experimental-1 Face-to-Face NTEPP, Experimental-2 Web-Based NTEPP

* $p < .05$, N= Number of People, SD= Standard deviation, df= Degree of freedom, η^2 = Effect Size

It was found that there was no significant difference in the pre-test and post-test between the follow-up test total mean scores for the NTP-KT of the groups. However, there was a statistically significant difference in the follow-up test, and this value indicated a large effect ($t_{(27)}=.020$; $p < .05$, $\eta^2=.183$). When these results were interpreted, it can be stated that both education programs were effective in increasing the naturalistic teaching knowledge levels of the participants. Furthermore, the results indicated that a significant difference in the joint interaction between the measurement time and group variables observed in the mixed design ANOVA analysis occurred in the follow-up measurement. This result can be interpreted that the knowledge obtained from the Face-to-Face NTEPP was more permanent compared to the Web-Based NTEPP. The findings obtained from the analysis of focus



group interviews, reflective diaries, and field notes also support these results. For example, teacher Eda summarized that the programs increased their naturalistic teaching knowledge levels by stating, "You caught us at the point where we were missing because we, as pre-school teachers, are unaware of many topics and practices in inclusion. With this education, we have learned a lot of scientific and practical information we didn't know...". These results are presented graphically in Figure 6.

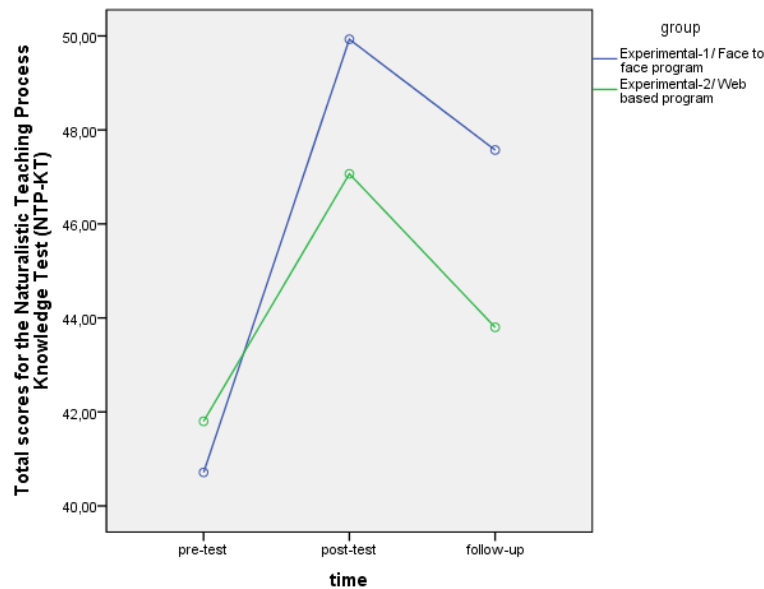


Figure 6. Effect of the interaction between the measurement time and education group on the total mean scores for the NTP-KT

Effect of the Education Programs on the Participants' Interactional Behavior Levels

While seeking an answer to the third question of the study, the presence of more than one dependent variable first suggested the mixed design MANOVA analysis, based on the presence of two different education groups, three different measurement times, and three subscales of the PBRSTV. However, there are many prerequisites for performing mixed design MANOVA analysis, such as sample size, normality, and linearity (Pallant, 2011; Tabachnick & Fidell, 2007). In the study, due to a small sample size, the presence of a correlation of less than 0.60 between univariate and multivariate normality and the dependent variables, nonlinear distributions of the dependent variables at independent variable levels, and failure to meet the homogeneity conditions of the variance-covariance matrix, multiple 3x2 mixed design ANOVA analyses were performed instead of this analysis. This method can be preferred by many researchers (Tabachnick & Fidell, 2007).

The descriptive results related to mean, standard deviation, minimum and maximum values of the total scores of the Experimental-1 and Experimental-2 groups from the subscales of the PBRSTV at different measurement times are presented in Table 6. The mixed design ANOVA analyses performed separately for each subscale are presented in Table 7, and the results of Sidak's multiple comparison test, which was performed to determine between which measurement times the significant differences found in the total scores obtained from the scales occurred, are indicated in the source of difference in Table 6.

When the data were analyzed, it was found that the total mean scores of the participants in both the Experimental-1 and Experimental-2 groups from the three subscales of the PBRSTV increased from pre-test to post-test and that these scores in the post-test were preserved in the follow-up test. The participants were expected to get a mean score of 3 from the "Achievement-Oriented-Directiveness" subscale and a mean score of 5 from other subscales. In this context, it can be said that both education programs increased the participants' total mean scores obtained from three subscales



from pre-test to post-test at an average value, which was quite close to the desired level, which also preserved in the follow-up measurement.

Table 6. Descriptive statistics related to the total scores of the Experimental-1 and Experimental-2 groups in three subscales of the PBRs-TV

Group	Subscales	Measurement Time	N	Mean	SD	Minimum	Maximum
Experimental-1 Face-to-Face NTEPP	Being Sensitive-Responsive	Pre-test	14	1.57	.852	1	3
		Post-test	14	3.36	1.008	2	5
		Follow-up	14	3.36	1.151	2	5
	Being Emotionally Expressive	Pre-test	14	1.79	.975	1	4
		Post-test	14	3.43	1.016	2	5
		Follow-up	14	3.36	1.216	2	5
	Being Achievement-Oriented-Directive	Pre-test	14	1.64	.929	1	3
		Post-test	14	2.93	.616	2	4
		Follow-up	14	2.71	.914	1	4
Experimental-2 Web-Based NTEPP	Being Sensitive-Responsive	Pre-test	16	1.56	.727	1	3
		Post-test	16	3.38	1.025	2	5
		Follow-up	15	3.07	1.100	1	4
	Being Emotionally Expressive	Pre-test	16	1.50	.730	1	3
		Post-test	16	3.38	1.025	2	5
		Follow-up	15	3.07	1.100	1	4
	Being Achievement-Oriented-Directive	Pre-test	16	1.88	1.088	1	5
		Post-test	16	3.06	.680	2	4
		Follow-up	15	2.67	.976	1	5

SD: Standard deviation, N: Number of People

When the mixed ANOVA summary chart was examined, it was observed that the change in the total mean scores obtained from the “Sensitivity-Responsivity” subscale of the PBRs-TV did not differ by groups ($F_{(1,27)}=.066$; $p>.05$). Similar results were also achieved for the subscales of “Affect-Expressiveness” ($F_{(1,27)}=.372$) and “Achievement-Orientation-Directiveness” ($F_{(1,27)}=.005$) ($p>.05$). These results can be interpreted that changes in the groups at different measurement times followed a similar path for all three subscales. Furthermore, it was found in the analyses that measurement and group interaction was not statistically significant in all three subscales, respectively ($F_{(2,54)}=.424$; $F_{(2,54)}=.278$; $F_{(2,54)}=.061$; $p>.05$).

These results can be interpreted that two education programs did not have a different effect on the total mean scores obtained by the participants from three subscales according to the measurement time. At this point, it is possible to say that both programs were effective in increasing and maintaining the interactional behavior levels of the participants.

The findings supporting these results were also achieved in the focus group interviews conducted after the implementation, weekly reflective diaries, and the researcher's field notes. In the analysis of the interviews, it was found that both education groups mentioned a number of contributions through which the knowledge obtained from the programs was transferred to the practices in the education process (start of using quality interaction and other naturalistic teaching strategies in the education process, etc.). For example, teacher Gamze exemplified that she started to be a sensitive-responsive teacher rather than exhibiting directive behaviors after the education by stating, "For example, the child was standing in the middle, I was directing him right away, go there, play here. But now, I pay much attention to what he cares about. I name what he is interested in and what he touches and shows...". A sample field note taken is as follows: "He was a very exhausted and unenthusiastic teacher. Now I see that he participates in children's plays and follows their interests warmly. The power of a teacher comes from love!"



Table 7. Mixed ANOVA results of the total scores of the Experimental-1 and Experimental-2 groups from the PBRs-TV

	Source of Variance	SS	df	MS	F	p	η_p^2	Source of Difference
Sensitivity-Responsivity	Intergroup							
	Group	.116	1	.116	.066	.799		
	Error	47.263	27	1.750				
	Intragroup							
	Measurement time	56.836	2	28.418	46.890	.000*	.635	1<2 1<3
	Measurement*group	.514	2	.257	.424	.656		
	Error	32.727	54	.606				
Total	137.456	86						
Affect-Expressiveness	Intergroup							
	Group	.788	1	.788	.372	.547		
	Error	53.143	27	2.116				
	Intragroup							
	Measurement time	53.393	2	26.697	51.260	.000*	.655	1<2 1<3
	Measurement*group	.290	2	.145	.278	.758		
	Error	28.124	54	.521				
Total	135.738	86						
Achievement-Oriented-Directiveness	Intergroup							
	Group	.005	1	.005	.005	.945		
	Error	30.730	27	1.138				
	Intragroup							
	Measurement time	27.638	2	13.819	32.535	.000*	.546	1<2 1<3
	Measurement*group	.052	2	.026	.061	.941		
	Error	22.937	54	.425				
Total	81.362	86						

*p<.05, SS= Sum of Squares, df: Degree of freedom, MS: Mean of Squares, η_p^2 = Partial Effect Size
Source of Difference =1:Pre-test, 2:Post-test, 3:Follow-up measurement

Effect of the Education Programs on the Participants' Use of Naturalistic Teaching Strategies in Education Processes

Leisure Time Activities: The Friedman test analyses were performed to examine the change in the total scores for naturalistic teaching strategies of the two education groups within themselves from the pre-test, post-test, and follow-up measurements of leisure time activities. The descriptive results related to mean, standard deviation, median, minimum and maximum values of the total scores of the groups analyzed are presented in Table 8, and the Friedman test results are presented in Table 9.

Table 8. Descriptive statistics related to the total scores for Naturalistic Teaching Strategies of the Experimental-1 and Experimental-2 groups from three different measurements of leisure time activities

Group	Measurement Time	N	Mean	SD	Mv	Minimum	Maximum
Experimental -1 Face-to-Face NTEPP	Pre-test	14	3.64	5.486	1.50	0	19
	Post-test	14	29.50	23.167	23.50	2	70
	Follow-up	14	30.93	25.254	20.50	1	74
Experimental -2 Web-Based NTEPP	Pre-test	16	1.56	4.211	.00	0	17
	Post-test	16	15.25	13.621	11.50	0	44
	Follow-up	15	6.40	8.131	2.00	0	26

N= Number of people, SD= Standard deviation, Mv= Median values



When the descriptive data were analyzed, the results revealed that there was an increase of 26 points in the total mean scores of the Experimental-1 group from pre-test to post-test and there was an increase of 14 points in the Experimental-2 group and that there was a decrease of 1 point in the Experimental-1 group from post-test to follow-up and there was a decrease of 9 points in the Experimental-2 group.

Table 9. Friedman test results related to the total scores for Naturalistic Teaching Strategies of the Experimental-1 and Experimental-2 groups from the measurements of leisure time activities at three different times

Group	Measurement Time	N	Mean R.	χ^2	df	p	Kendall's W
Experimental-1 Face-to-Face NTEPP	Pre-test	14	1.21	33.138	2	.000*	.473
	Post-test	14	3.79				
	Follow-up	14	4.07				
Experimental-2 Web-Based NTEPP	Pre-test	16	1.87	26.574	2	.000*	.354
	Post-test	16	4.00				
	Follow-up	15	2.93				

*p<.05, N= Number of People, Md= Median; Mean R.= Mean rank, χ^2 = Chi-square value, df: Degree of freedom, Kendall's W= Kendall's coefficient of concordance

In the Friedman test results, it was found that there was a significant difference between the total scores for naturalistic teaching strategies of the Experimental-1 and Experimental-2 groups in the leisure time activity in three different measurements and that this difference indicated a large effect [$\chi^2(2, n=14)=33.138, p<.05, Kendall's W=.473; \chi^2(2, n=15)=26.574, p<.05, Kendall's W=.354$]. These results can be interpreted that both education programs led to a significant difference between the total scores at any two measurement times. The results of the Wilcoxon signed-rank test that was performed to determine the source of the significant difference that emerged, in other words, between which measurements it occurred, are presented in Table 10. Since pairwise comparisons were performed between the measurements on the same data sets obtained from three different measurements of the groups in these tests, the Bonferroni correction ($p=.05/3=.017$) was performed by dividing the value of significance by three for each analysis to reduce the possibility of finding significant results by chance. Thus, it was aimed to reject a truly correct null hypothesis, in other words, to control Type 1 error (Alpha error), which means finding something that is not really significant significant (Pallant, 2011, p. 237).

In the Wilcoxon signed-rank test results, it was determined that there was a significant difference between the pre-test/post-test ($z=-3.296; p<.017; r=.88$) and pre-test/follow-up total scores for naturalistic teaching strategies ($z=-3.297; p<.017; r=.88$) obtained by the Experimental-1 group from the measurement of leisure time activities, and that there was no significant difference between the pre-test/follow-up total scores for naturalistic teaching strategies. When the mean rank and totals of the difference scores were taken into consideration, this difference was observed to be in favor of positive ranks, in other words, the post-test scores. Similar results were also achieved for the Experimental-2 group.

Table 10. Wilcoxon signed-rank test results related to the total scores for Naturalistic Teaching Strategies of the Experimental-1 and Experimental-2 groups obtained from leisure time activities

Group	N	Mean R.	Sum of R.	z	p	r	
Experimental-1 Face-to-Face NTEPP	Post-test/Pre-test						
	Negative Rank	0	.00	.00	-3.296	.001*	.88
	Positive Rank	14	7.50	105.00			
	Equal	0					
	Follow-up/Post-test						
	Negative Rank	7	7.00	49.00	-.220	.826	-
	Positive Rank	7	8.00	56.00			
	Equal	0					



Experimental-2 Web-Based NTEPP	Follow-up/Pre-test						
	Negative Rank	0	.00	.00	-3.297	.001*	.88
	Positive Rank	14	7.50	105.00			
	Equal	0					
	Post-test/Pre-test						
	Negative Rank	2	2.00	4.00	-3.184	.001*	.79
	Positive Rank	13	8.92	116.00			
	Equal	1					
	Follow-up/Post-test						
	Negative Rank	10	7.85	78.50	-2.310	.021	-
	Positive Rank	3	4.17	12.50			
	Equal	2					
	Follow-up/Pre-test						
	Negative Rank	1	3.00	3.00	-2.695	.007*	.69
	Positive Rank	10	6.30	63.00			
	Equal	4					

*p<0.017 (Bonferroni correction), N= Number of People, Mean R.= Mean rank, Sum of R.= Sum of ranks, Effect Size $r = z / \sqrt{n}$

A series of the Mann-Whitney U tests were performed for the *intergroup comparison* of the total scores for naturalistic teaching strategies used in leisure time activities in the pre-test, post-test, and follow-up measurements.

Table 11. Mann-Whitney U test results in which the total scores for Naturalistic Teaching Strategies obtained from the measurement of leisure time activities at three different times were compared by groups

Measurement Time	Group	N	Mean R.	Sum of R.	U	z	p	r
Pre-test	Experimental-1	14	18.36	257.00	72.000	-1.782	.075	-
	Experimental-2	16	13.00	208.00				
Post-test	Experimental-1	14	18.29	256.00	73.000	-1.624	.104	-
	Experimental-2	16	13.06	209.00				
Follow-up	Experimental-1	14	20.00	280.00	35.000	-3.064	.002*	.81
	Experimental-2	15	10.33	155.00				

* Experimental-1= Face-to-Face NTEPP, Experimental-2= Web-Based NTEPP *p<.05, N= Number of People, Mean R.=Mean rank, Sum of R.= Sum of ranks, U=Mann-Whitney U value, Effect Size $r = z / \sqrt{n}$

In the analyses, it was observed that there was a significant difference between the total scores for naturalistic teaching strategies of the groups measured in the same activity, and this difference indicated a large effect (U=35.000; z=-3.064; p<.017, r=.81). In brief, the fact that no significant difference was found between the total scores for naturalistic teaching strategies measured in the leisure time activities of the groups in the pre-test and post-test can be interpreted that both education programs were effective in increasing the initial total scores of the participants. However, it can be said that the Face-to-Face NTEPP had a more permanent effect on the total scores for leisure time naturalistic teaching strategies of the participants.

Art Activities

The change between the total scores for naturalistic teaching strategies obtained by the Experimental-1 and Experimental-2 groups from the measurement of art activities at three different times was analyzed by the Friedman test analyses. The descriptive results related to mean, standard deviation, median, minimum and maximum values of the total scores of the groups included in the analysis are presented in Table 12, and the Friedman test results are presented in Table 13.



Table 12. Descriptive statistics related to the total scores for Naturalistic Teaching Strategies obtained by the Experimental-1 and Experimental-2 groups from the measurement of art activities at three different times

Group	Measurement Time	N	Mean	SD	Md	Minimum	Maximum
Experimental-1 Face-to-Face NTEPP	Pre-test	14	15.71	13.903	15.00	0	43
	Post-test	14	40.50	31.334	37.00	4	110
	Follow-up	14	26.71	21.265	20.50	5	78
Experimental-2 Web-Based NTEPP	Pre-test	16	5.13	10.138	3.00	0	42
	Post-test	16	18.88	18.195	19.00	0	66
	Follow-up	15	14.73	10.089	15.00	1	35

N= Number of People, SD= Standard deviation, Md= Median values

It was found that there was an increase of 35 points in the total mean scores of the Experimental-1 group from pre-test to post-test and there was an increase of 14 points in the Experimental-2 group and that there was a decrease of 14 points in the Experimental-1 group from post-test to follow-up and there was a decrease of 4 points in the Experimental-2 group.

Table 13. Friedman test results related to the total scores for art activity Naturalistic Teaching Strategies of the Experimental-1 and Experimental-2 groups measured at three different times

Group	Measurement Time	N	Mean R.	χ^2	Df	p	Kendall's W
Experimental-1 Face-to-Face NTEPP	Pre-test	14	1.36	9.571	2	0.008*	0.342
	Post-test	14	2.50				
	Follow-up	14	2.14				
Experimental-2 Web-Based NTEPP	Pre-test	16	1.37	9.390	2	0.009*	0.313
	Post-test	16	2.23				
	Follow-up	15	2.40				

*p<.05, N= Number of People, Md= Median; Mean R.= Mean rank, χ^2 = Chi-square value, Df: Degree of freedom, Kendall's W= Kendall's Coefficient of Concordance

It was determined that there was a significant difference between the total scores for art activity naturalistic teaching strategies of the Experimental-1 and Experimental-2 groups in three different measurements within themselves and that this difference indicated a large effect [$\chi^2(2, n=14)= 9.571$, p<.05, Kendall's W=.342; $\chi^2(5, n=15)=9.390$, p<.05, Kendall's W=.313]. The results of the Wilcoxon signed-ranks tests that were performed to determine between which measurements this difference occurred are presented in Table 14, and it is observed in the results that there was a difference with a significant and large effect.

Table 14a. Wilcoxon signed-rank test results related to the total scores for Naturalistic Teaching Strategies of the Experimental-1 and Experimental-2 groups obtained from art activities

Group		N	Mean R.	Sum of R.	z	p	r	
Experimental-1 Face-to-Face NTEPP	Post-test/Pre-test							
		Negative Rank	2	5.00	10.00	-2.671	.008*	.71
		Positive Rank	12	9.92	95.00			
		Equal	0					
		Follow-up/Post-test						
		Negative Rank	9	9.33	84.00	-1.978	.048	-
		Positive Rank	5	4.20	21.00			
		Equal	0					
		Follow-up/Pre-test						
		Negative Rank	3	7.17	21.50	-1.947	.052	-
		Positive Rank	11	7.59	83.50			
		Equal	0					



Table 14b. Wilcoxon signed-rank test results related to the total scores for Naturalistic Teaching Strategies of the Experimental-1 and Experimental-2 groups obtained from art activities

Experimental-2 Web-Based NTEPP	<i>Post-test/Pre-test</i>							
	Negative Rank	4	3.75	15.00	-2.557	.011*	.64	
	Positive Rank	11	9.55	105.00				
	Equal	1						
	<i>Follow-up/Post-test</i>							
	Negative Rank	7	10.36	72.50	-0.710	.478		
	Positive Rank	8	5.94	47.50				
	Equal	0						
	<i>Follow-up/Pre-test</i>							
	Negative Rank	2	7.75	15.50	-2.529	.011*	.65	
	Positive Rank	13	8.04	104.50				
	Equal	0						

*p<.017 (Bonferroni correction), N= Number of People, Mean R.= Mean rank, Sum of R.= Sum of ranks, Effect Size
 $r = z / \sqrt{N}$

A series of Mann-Whitney U tests were performed for the intergroup comparison of the total scores for art activity naturalistic teaching strategies of the participants measured at three different times.

Table 15. Mann-Whitney U test results in which the total scores for art activity Naturalistic Teaching Strategies measured at three different times were compared by groups

Measurement Time	Group	N	Mean R.	Sum of R.	U	z	p	r
Pre-test	Experimental-1	14	19.04	266.50	62.500	-2.073	.038*	.37
	Experimental-2	16	12.41	198.50				
Post-test	Experimental-1	14	19.54	273.50	55.500	-2.351	.019	-
	Experimental-2	16	11.97	191.50				
Follow-up	Experimental-1	14	17.50	245.00	70.000	-1.532	.126	-
	Experimental-2	15	12.67	190.00				

Experimental-1: Face-to-Face NTEPP, Experimental-2: Web-Based NTEPP

*p<.05, N= Number of People, Mean R.= Mean rank, Sum of R.= Sum of ranks, U=Mann-Whitney U value, Effect Size
 $r = z / \sqrt{N}$

When Table 15 was examined, it was found that there was a significant difference between the total pre-test naturalistic teaching strategies scores measured in the art activities of the Experimental-1 and Experimental-2 groups and that this difference indicated a large effect (U=62.500; z=-2.073; r=.37; p>.05). This situation, which can also be observed in descriptive statistics values, can be interpreted that the total naturalistic teaching strategy levels used by both groups in the art activities were not similar before the implementation. However, it was considered that this situation that was observed only in this data set and analysis of the study might be due to the fact that the "total scores for naturalistic teaching strategies obtained by several participants from the art activity had extreme values in the data." In the literature, this incident is expressed among the limitations of the "quasi-experimental design," and it is indicated that the extreme values taken by several participants may affect the results of the analysis performed with a group having a small sample size (Cresswell, 2011). To make a decision according to the split-plot in such a data set, or to equalize the groups by extracting extreme values from the data are among the recommended methods (Pallant, 2011; Tabachnick & Fidell, 2007). However, since studies were conducted with a special and small target group in this study, the choice of non-foreign intervention to the test process, and the fact that it was observed that the difference in the intergroup pre-test scores found only in this analysis was not very big on the chart, no reduction was made in the data by deleting the extreme values, and the analyses were performed with normal data.

When all the results are summarized, it is possible to state that both education programs had an effect on the participants with regard to using and maintaining naturalistic teaching practices in art activities. The findings supporting these results were also achieved in the focus group interviews conducted after



the implementation, weekly reflective diaries, and the researcher's field notes. In the analysis of the interviews, one of the topics that were observed to be discussed within the professional contributions acquired by the participants from the programs was the use of naturalistic teaching strategies in daily education and training process after the education. The participants exemplified and stated that they started to use both environmental arrangements and other naturalistic teaching strategies in their daily activities after the teaching education process. For example, teacher Leyla, one of the Web-Based NTEPP participants, exemplified that she started to use making inaccessible, one of the environmental arrangement strategies, and expansion and bombardment of words from other naturalistic teaching strategies in the education process by stating, "In the art activity, I give the paper to students and wait for them to ask for their paint...they come and either raise their fingers or ask me to give it. I immediately expand it by saying, give the paint. I say what they cannot say in the form of bombardment during the day." Finally, a sample field note regarding this issue was as follows: "Is this a teacher just sitting in his chair during a leisure time activity that I have seen? It makes me surprised that he makes children's plays fun by creating surprising situations, presents linguistic models to children by naming what they do, and expands their reactions. The power of this teacher comes from his effort to reflect what he has learned into practice."

Examination of the Participants' Opinions and Experiences on the Education Programs

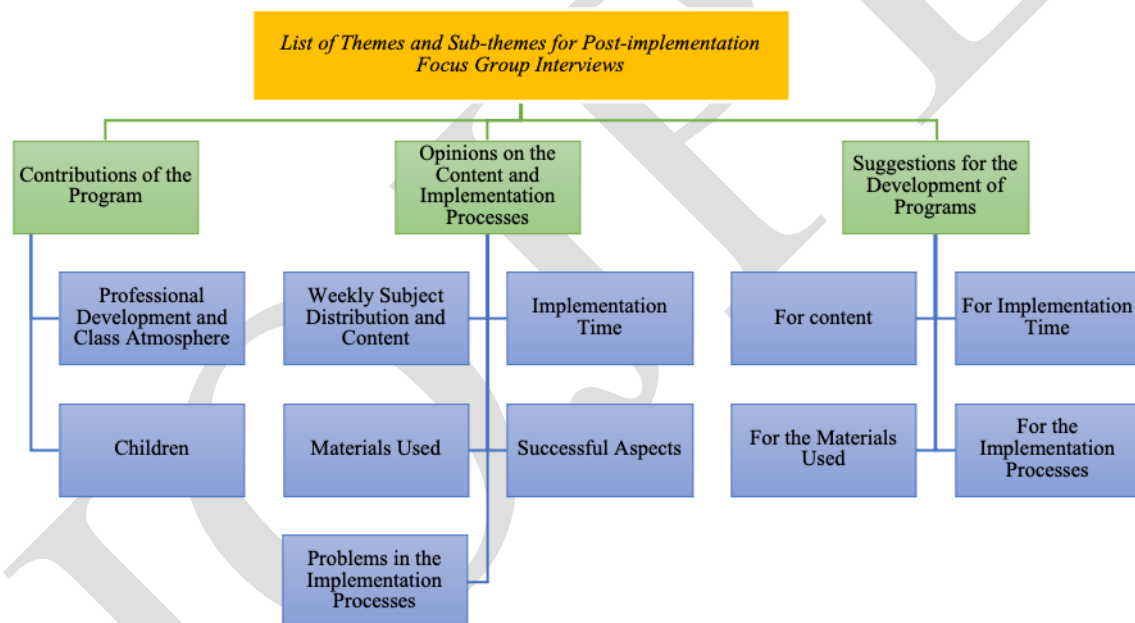


Figure 7. List of Themes and Sub-themes for Post-implementation Focus Group Interviews

At this stage, focus group interviews were conducted with the participants as before the implementation. As a result of the analysis from the interview data, a total of three main themes and eleven sub-themes showed in Figure 7 were achieved. First, it was revealed in the analyses that all participants acquired a large number of contributions through which they could obtain knowledge about the naturalistic teaching process from the programs professionally, and then they could transfer this knowledge to various practices. These contributions were better observing students and directing students and their families to institutions that make a diagnosis or evaluation when required, naming naturalistic teaching practices that were performed in the daily education process and realizing these practices in a more conscious way, and starting to use newly learned practices. The participants of both programs indicated that with these practices they implemented, children became more active in their classrooms, and a more entertaining atmosphere was formed. Under the main theme of "Opinions about the content of the programs and implementation processes," it was found that all participants in both education groups considered the content of the programs as holistic, interrelated



and sufficient, and they considered the materials used as linguistically clear and understandable materials with visuals, many colors, and case study consisting of pill knowledge. Furthermore, it was observed that the participants generally described education programs with the words of “effective,” “successful,” “touching education,” and “fun.” Moreover, it was determined that the education programs were described by the metaphor of “*life buoy*.” The opinions of teacher Aslı about this subject are as follows: “... *the seminar has provided things that will save our lives in practice. It has become a life buoy for us. In other seminars, they just tell us, clap your arm, you can swim. I can't swim... I will somehow go ashore now, but in the meantime, I will have learned to swim...*” Along with these positive opinions, it was observed that the participants also provided some opinions regarding the aspects of the programs that needed to be developed and the problems experienced during the implementation process. The participants who attended both the face-to-face and web-based programs stated that they had difficulty in following the programs due to their personal responsibilities, that they needed “repetition of knowledge, application practice, and therefore, time” in order to internalize the naturalistic teaching strategies they learned from the programs and to specialize in practice, and that a large class size and the lack of auxiliary staff in practice were complicating factors. These results make it necessary to consider the variables that will increase motivation in participation in education programs prepared for teachers, and the factors affecting the functioning of teacher education programs in the inclusive education process in Turkey.

The suggestions for the solution of these problems mentioned by the participants in the analysis of the interviews were listed as the implementation of programs during the seminar period, the inclusion of more sample videos that may contribute to the implementation processes and coping strategies with classroom management/problem behaviors in the programs, and the operation of the coaching system. Furthermore, it was remarkable that the participants associated their suggestions for the problems experienced in the implementation of evidence-based applications such as naturalistic teaching in the education processes with the functioning of inclusive pre-school education in Turkey. In this context, the participants emphasized that the inclusive school education system, which is functioning systematically in our country, should be developed, that class sizes should be reduced for the qualified functioning of this system, that supports for auxiliary staff and materials should be provided, that different teacher education programs on evidence-based practices such as naturalistic teaching should be developed, and that the cooperation processes with families and CRC should be accelerated. For example, teacher Deniz, one of the Face-to-Face NTEPP participants, stated, “...*they should assist each other...The main problem is that there is no inclusive system understanding. Applications and problems are reflected in the parts of the whole system. If these problems are resolved, teacher training programs work in a more qualified manner*”.

In conclusion, the results of this study have formed a basic frame regarding the functioning of inclusive early childhood education in Turkey and teacher education programs from support services in this process.

DISCUSSION and CONCLUSION

In the study, the prior knowledge, opinions, and experiences of pre-school teachers regarding inclusive education and the naturalistic teaching process were first examined before the implementation, and thus, the need for professional education programs was also revealed. The first main conclusion obtained from the study is that pre-school teachers indicated that inclusive education is a system that should be present in Turkey and made a lot of contributions to them, students, and families with regard to many issues such as recognizing and accepting differences. These results suggested that teachers might basically have a moderate approach to inclusive education. Nevertheless, it was determined that the moderate approaches of teachers towards inclusive education could be affected by various factors. The participants listed these factors as stakeholders, education and training setting, insufficient support services and problems related to the political system at the upper level, especially the lack of knowledge about students with special needs and their



characteristics, and practices that can be easily applied in classrooms such as the naturalistic teaching approach. It was indicated that the improvement of the participants' lack of knowledge through professional development programs could result in the “social acceptance process” of children with special needs and their families spreading from teachers, students, and families to the society. All these results that are associated with each other are also supported by many research results in the international and national literature (Bailey & Winton, 1987; Bozarslan & Batu, 2014; Diamond & LeFurgy, 1994; Emam & Mohamed, 2011; Kasari, Freeman, Bauminger, & Alkin, 1999; Krischler, Pit-ten Cate & Krolak-Schwerdt 2018; Rakap, Parlak-Rakap, & Aydın, 2016; Rakap & Rakap, 2014; Sucuoğlu, Bakkaloğlu, Akalın, Demir, & İççen-Karasu, 2015; Sucuoğlu et al., 2013; Winton, Turnbull, Blacher, & Salkind, 1983). In the studies, teachers' lack of knowledge and education on evidence-based practices that they can transfer into education processes is considered as one of the biggest systemic problems experienced in inclusive education, and it is considered that a solution to the problem of methodological knowledge can be produced through professional development programs including visual and written materials (Boyd, Kucharczyk, & Wong, 2016; Bruder, 2016).

According to one of the main results of the study, the five-week face-to-face and web-based programs developed were effective in increasing the participants' total scores for naturalistic teaching knowledge, interactional behaviors established by them with children, and naturalistic teaching strategies they used in leisure time and art activities. However, it was found that the face-to-face education program had a more permanent effect on the participants' total scores for naturalistic teaching knowledge and naturalistic teaching strategies used in leisure time activities compared to the web-based program. When the literature is reviewed, it is possible to find studies in which the effects and permanency of both face-to-face and web-based programs on targeted teacher behaviors are examined independently of each other (Christensen-Sandfort, & Whinnery, 2013; Harjusola-Webb & Robbins, 2012; Kohler, Anthony, Steighner, & Hoyson, 2001; Malmskog & McDonnell, 1999; Marsicano, Morrison, Moomaw, Fite, & Kluesener, 2015; Wolery, Anthony, Caldwell, Snyder, & Morgante, 2002). However, there was no study in which the effects and permanency of naturalistic teaching-based face-to-face and web-based education programs in the pre-school inclusive education process on the targeted performances of participants were compared. The results of the aforementioned studies revealed that both web-based and face-to-face education programs had a successful effect on the targeted performance levels of participants. In the literature, it is remarkable that the features of face-to-face or web-based practices such as their permanence and forms of presentation were discussed rather than their effects. At this point, it is discussed that face-to-face education programs have limitations, such as the fact that they may be time-consuming for researchers and participants. With regard to permanence, there are research results revealing that services such as counseling and coaching provided with web-based programs or longer-term education may have a more effective and permanent effect on the knowledge, skills, and behaviors that are aimed to be acquired by participants and may result in the transfer of the practices learned to the education process with a higher level of reliability (Kohler et al., 2001; Stahmer et al., 2015; Tate et al., 2005). In accordance with these results, it can be said that web-based programs, the contents of which were designed with visual and written materials, could be as effective as face-to-face programs on teachers' targeted performance levels; however, with which components and in which forms the programs on permanence should be presented to teachers is on the agenda of scientific discussion. In the focus of the discussions, it is suggested in the literature that multi-component education programs can be designed, and it is also emphasized that these designs depend on the situations of the country, the researcher and the participants such as source, time and motivation (Frantz, 2017; Dick, 2017; Han, 2012; Hemmeter, Snyder, Kinder, & Artman, 2011). In this study, the fact that the face-to-face education program had a more permanent effect on the participants' naturalistic teaching knowledge levels compared to the web-based program was considered to be due to systemic (infrastructure-based) problems in Turkey, along with the individual and motivational issues affecting the participants' time periods to follow the web-based program. In this context, it was revealed that the internet infrastructure should be developed, or the videos should be prepared in accordance with this



infrastructure so that teachers working in schools affiliated to the Ministry of Education in Turkey can watch the videos in the prepared web-based program without interruption. It is recommended to find the factors that will increase motivation with respect to teachers' more frequent participation in web-based programs.

Another result obtained from the study was that the teachers' opinions about the programs were quite positive. In the literature, it was also remarkable that social validity data were collected in the studies on teacher education programs, and in these data, it was observed that teachers found both face-to-face and web-based education programs prepared with written and visual materials effective and successful (Dick, 2017; Frantz, 2017; Gianoumis et al., 2012; Marsicano et al., 2015). Nevertheless, in the interviews, it was indicated that some problems, such as excessive class size, the lack of auxiliary staff and materials, and inadequate cooperation with stakeholders, were experienced in the transfer of knowledge obtained from the programs into practice, and that these problems could be basically solved by transforming inclusive pre-school education in Turkey into a more functional and qualified system. In the studies in the literature, inclusive pre-school education was discussed as an ecological system approach, and it was stated there were many factors that affect the quality of the system (Odom, 2002; 2016; Odom et al., 1996; Odom et al., 2002). It is observed that these factors that affect and are affected by each other include issues such as legal regulations, cooperation between stakeholders, providing support services, and arrangement of the education and training setting and process (Odom, 2016). It is overemphasized that any problem occurring in these factors, which are described as inseparable parts within the system, grows like a snowball and disrupts the holistic and qualified functioning of practices (Odom, 2002; 2016; Odom et al., 1996; Odom et al., 2002).

In brief, it is observed that web-based programs, the content of which is designed with visual and written materials, can be as effective as face-to-face programs on the targeted performance levels of teachers and have gained importance with their functionality in recent years. Nowadays, when the COVID-19 epidemic covering the whole world is experienced, it is observed that web-based programs, which can be followed at home and can spread all over the countries, have increasingly gained momentum and that these programs will continue to gain momentum in the future. However, it can be said that with which components, and in which forms the programs on permanence should be presented to teachers is on the agenda of scientific discussion. Nevertheless, it can be stated that the knowledge obtained from teacher education programs can be better reflected in classroom settings by resolving the infrastructural and systemic problems in Turkey.

The results of this study should be interpreted with some of its limitations. It is important to be able to ensure control in a lot of quantitative and qualitative data that should be collected due to the nature of the mixed method (Cresswell, 2014). Therefore, this study was carried out with a quasi-experimental design with 30 pre-school teachers who were a special study group and voluntarily agreed to participate in the education programs in Eskişehir province (limited sample size) in Turkey. Based on the need to focus on examining the effects of teacher education programs on targeted teacher behaviors and to provide time control, the effects of programs on child outcomes and families could not be examined. Furthermore, naturalistic teaching is a holistic approach containing many strategies, methods, and techniques. Therefore, in the study, which of the strategies, methods, and techniques included in the naturalistic teaching approach were used most or least by teachers was not compared with each other, and all analyses were performed on the total scores obtained from naturalistic teaching practices.

Within the context of the problems mentioned above, some suggestions that can be made for a more qualified functioning of the international inclusive education system and inclusive education system in Turkey and for further studies can be listed as follows: In the literature, inclusive education is discussed as an “*ecological system*,” in which many individuals and services (stakeholders, physical arrangements, support special education services, etc.) should work together. In this context, it is quite important to develop a qualified and functioning system for inclusive education both in Turkey and in other developing countries. Within the system, it is recommended to carry out studies on issues such



as preparing various professional development programs for the solution of the lack of knowledge and education of teachers, developing a physical environment and material opportunities, planning the services to be provided to children with special needs and their families, and increasing cooperation between stakeholders. In order to find solutions to the lack of knowledge and education in inclusive pre-school education, it may be suggested to develop and implement various education programs on different evidence-based practices such as naturalistic teaching for teachers and families and to make them widespread. There is a limited number of studies on the relevant subject in the international literature and in the literature in Turkey, and it is possible to carry out different scientific studies in which the effects and permanence of naturalistic teaching approach-based face-to-face and web-based teacher education programs on teachers, children, and families' performances are compared. Professional development programs on different evidence-based practices can be developed, and their effectiveness and permanence can be evaluated.

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