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The Effects of Colorful Worlds of Sounds Program on Phonological Awareness of Preschool Children *

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Abstract

The aim of the study is to examine the effects of Colorful Worlds of Sounds Program on phonological awareness skills of preschool children. The research design is quasi-experimental pretest-posttest with control group. Study group was chosen from a preschool by random sampling among public preschools located in Eskisehir city center during the 2014-2015 education year of spring semester. In that preschool located in Eskisehir, one of the preschool classroom in which 5 years of age (60-72 months) children were enrolled was assigned as experimental group and another classroom was assigned as control group. There were 24 children in experimental group and 19 children in the control group. "General Demographic Form" and "The Phonological Awareness Scale of Early Childhood Period (PASECP)" were used as measurement tools. After the pretest was applied to children in the experimental and control groups, Colorful Worlds of Sounds Program was implemented to the experimental group children by the researcher. The program implemented throughout eight weeks, three days in a week and an hour in a day. At the end of the implementation, posttest was applied to both the experimental and the control group. 2x2 mixed ANOVA was used to reveal whether there is a significant difference between the pretest and posttest of total phonological awareness scores of the experimental and the control group or not. Moreover, 2x2 mixed ANOVA was used to compare pretest and posttest scores obtained from the subtests. The results indicated that there was a significant difference between total phonological awareness scores of the experimental and the control group and all subtests scores of the groups. Based on these results it can be said that Colorful Worlds of Sounds Program was effective to develop preschool children's phonological awareness skills.

Keywords

Phonological awareness
Emergent literacy
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Introduction

In world's most culture, being able to read and write are considered as necessary skills to be fully integrated into a society, to participate and to contribute to the society (Bruce & Spratt, 2008). Literacy begins to develop from the early ages and it is seen as a lifelong learning process to reach the goals of people and to expand their information and their potential (United Nations Educational, Scientific, and Cultural Organization [UNESCO], 2004). Lots of information and skills need to come together at the same time for reading and writing or in other words for understanding and creating a text. Word recognition and spelling ability is crucial in the process of reading comprehension and creating a text. These two abilities depend on the knowledge of phonological awareness (Stahl & Murray, 1994). Although children are get used to using language as a communication tools, for reading and writing language should be interpreted in an abstract way so phonological awareness skills need to be developed (Gunning, 2000).

Children's future school performance in reading is affected by three factors. These are expressive language development, phonological awareness and writing knowledge (Whitehurst & Lonigan, 1998). These three factors constitute early reading and writing abilities. Studies show that phonological awareness development is crucial to attain reading and writing skills as well as cognitive, physical, social and emotional development (Anthony & Francis, 2005; Burns, Roe, & Ross, 1992; Chard & Dickson, 1999; Durgunoğlu & Öney, 1999; Goswami & Bryant, 1990; McGee & Morrow, 2005; Torgesen, Morgen, & Davis, 1992; Wright, Stackhouse, & Wood, 2008). Research conducted with different methods and alphabetic languages in the literature indicate that there is a strong relationship between literacy development and phonological awareness (Chaney, 1992; Dickinson & Snow, 1987; Justice & Ezell, 2001; Lundberg, Olofsson, & Wall, 1980; Whitehurst & Lonigan, 1998).

Phonological awareness is defined as being aware of that verbal language can be divided into small phonemes and making changes on these phonemes (Chard & Dickson, 1999). Phonological awareness includes being aware of phonemes forming a word, recognizing phonemes, manipulating phonemes and some mental processing skills like recognition, identification, discrimination, focusing and discovering to perform all of these (Gillon, 2007). The concept of phonological awareness can be expressed with different terms in the literature. Phonological awareness, phonological sensitivity, and phonemic awareness are the concepts that can be used one another.

Phonological awareness skills compose from different levels or skills. There is a hierarchical structure in these levels used to measure phonological awareness skills. Phonological awareness consists of these skills by following basics to the complex ones. According to Rief and Stern (2010), hierarchical structure among phonological awareness skills builds on each other so that one skill provides a basis for another. Phonological awareness is a multi-level skills including the division into small pieces (Muter, Hulme, Snowling, & Taylor, 1997; Stahl & Murray, 1994). There are three levels in phonological awareness as syllable awareness, rhyme awareness and phonemic/phoneme awareness (Gunning, 2000).

According to Bryant (1990), rhyme recognition can be seen as the first step to gain phonological awareness. Recognizing that last syllables of the words can be similar is only possible when it is paid attention to the internal structure of the word instead of the meaning of it. In order to make this, children have to create a new classification system. In this classification, similarity of the last sounds is taken as a criterion instead of the meaning of the word. It is stated that children can identify rhyme in the words as early as three or four years of age (Bryant, 1990).

Phonological awareness in the syllable level is to recognize that a word can be divided into syllables. Treiman (1983) examined spelling abilities of children and found some principles that children recognize in this process. First principle is that every syllable forming a word includes a vowel.

Secondly, syllables are divided by emphasis when a word is pronounced. Hence, it is stated that syllable awareness is gained by realizing these principles.

A word is divided into the smallest pieces in the phoneme level. Phoneme is defined as the smallest part of a word affecting the meaning of it (Gillon, 2007). Phonemic awareness takes an important role in reading and writing because thanks to phonemic awareness sounds' features of spoken language are coded. In this way, a basis for alphabetic development to comprehend written language is formed. Children who can make verbal language analysis, can use this skill to comprehend rule of a written language and to analyze it (Hempenstall, 1997). Phonemic awareness skills like producing a new word with a given sound or identification of first and last sounds of a word can be gained by children who are 60-72 months (Ecenbarger, 2006).

There are studies showing phonological awareness is the strongest predictor of school performance by leaving behind cognitive abilities and skills like IQ, word knowledge, listening comprehension (Adams, 1990; Cullinan, 2000; Bradley & Bryant, 1983; Juel, 1988; Wagner & Torgesen, 1987; Yopp, 1988). Children who start school with low phonological awareness skills show low performance in reading compared to the children who are aware of a word's sound structure and can manipulate sounds (Adams, 1990; Liberman & Shankweiler, 1985; Mann & Brady, 1988; Spector, 1995; Stanovich, 1988; Wagner, 1988). Many research conducted to examine phonological awareness in preschool and primary school period show that phonological awareness predicts medium or high level of reading rate, reading fluency and reading comprehension (Anthony & Francis, 2005; Bryant, MacLean, Bradley, & Crossland, 1990; Catts, Gillispie, Leonard, Kail, & Miller, 2002; Erdoğan, 2012; Kirby, Parrila, & Pfeiffer, 2003; Oudeans, 2003; Share, Jorm, MacLean, & Mathews, 1984; Stahl & Murray, 1994; Stanovich, Cunningham, & Cramer, 1984; Wagner & Torgesen, 1987; Wagner, Torgesen, & Rashotte, 1994; Weiner, 1994).

Studies carried out in early childhood period indicate that, children who participate in a program aiming to develop phonological awareness exhibit reading performance much more earlier. Moreover, it is seen that strong relationship between phonological awareness and reading success is sustained not only in preschool period but also in the following years (Backus, 2005; Catts et al., 2002; Catts, Herrera, Nielsen, & Bridges, 2015; Chard & Dickson, 1999; Gräsel, Gutenberg, Pietzsch, & Schmidt, 2004; Hulme et al., 2002; Justice & Kaderavek, 2004; Justice & Pullen, 2003; Petscher & Kim, 2011; Lepola, Lynch, Kiuru, Laakkonen, & Niemi, 2016; McCardle, Scarborough, & Catts, 2001; Munger & Blachman, 2013; National Early Literacy Panel [NELP], 2008; Riedel, 2007; Roth & Schneider, 2002; Scarborough, 2009; Schneider, Roth, & Ennemoser, 2000; Snow, Burns, & Griffin, 1998; Storch & Whitehurst, 2002; Sulzby, 1985; Torgesen et al., 1992; Treutlein, Zöller, Roos, & Schöler, 2008; Weber, Marx, & Schneider, 2007; Whitehurst & Lonigan, 2001).

In Turkey, children starting to primary school begin to learn reading and writing with Sound Based Sentence Method instead of Sentence Analysis Method from 2005-2006 academic year. In the Sound Based Sentence Method, the first literacy instruction starts with sounds. The sounds are first given in such a way as to form a meaningful whole, and then syllables are formed and lastly words are formed from syllables. In this context, phonological awareness skills that is supported and developed in the preschool period will be the basis for the acquisition of reading and writing because it is being aware of that verbal language can be broken down into small phonemes and these phonemes can be modified. Although there are goals and indicators concerning phonological awareness in Ministry of National Education 2013 Preschool Education Program, it can be said that activities related to this skill are not provided enough and there is not so much resource explaining how to develop this skill. Similarly, in Turkey most parents perceive emergent literacy as teaching to read and write. Also, it is observed that parents are not aware of the function of phonological awareness skills that provide a basis for reading and writing. However, longitudinal studies indicate that there is strong relationship

between providing children experiences concerning early reading and writing and success in reading and writing in the following ages (Crone & Whitehurst, 1999; Oliver, Dale, & Plomin, 2005; Purcell-Gates, 1996).

When the literature related to early childhood education in Turkey is examined, it is seen that limited number of research is conducted concerning phonological awareness (Aktan Kerem, 2001; Aktan, 1996; Altun, Erden, & Snow, 2016; Bayraktar & Temel, 2014; Erdoğan, 2012; Erkan Süel, 2011; Karakelle, 2012; Karaman & Üstün, 2011; Karaman, 2006; Kargın, Ergül, Büyüköztürk, & Güldenoğlu, 2015; Kartal & Güner, 2017; Özcan & Özcan, 2014; Sarı, 2012; Sarı & Aktan Acar, 2013; Sayar & Turan, 2012; Turan & Akoğlu, 2011; Turan & Gül, 2008; Uyanık & Kandır, 2010; Yangın, 2009; Yücel, 2009). These studies mostly conducted with primary school 1st grade students (Erdoğan, 2012; Karakelle, 2012) and in special education area (Erkan Süel, 2011; Yücel, 2009). Some of these studies were related to development of a measurement tool (Sarı & Aktan Acar, 2013; Kargın et al., 2015), some of them were review articles (Erdoğan, 2009; Özcan & Özcan, 2014; Turan & Gül, 2008; Uyanık & Kandır, 2010), one of them examined effects of home resources in terms of phonological awareness (Altun et al., 2016) and one of them investigated activity books in terms of including phonological awareness activities (Kartal & Güner, 2017). Studies conducted with kindergarten children examined children's phonological awareness coming from different socio-cultural status (Karaman, 2006; Karaman & Üstün, 2011) and the effects of Educational Program of Readiness for Reading and Writing (EPPRW) on the print awareness of kindergarten children, phonological awareness and the level of reading-writing skills levels in primary school (Bayraktar & Temel, 2014). In addition, in one study, the effects of phonological awareness programs on children's auditory discrimination skills and articulation skills were investigated (Turan & Akoğlu, 2011). Therefore, it can be said that there is not adequate research in Turkey concerning early reading and writing to develop these skills in preschool period. Based on these, revealing the effects of phonological awareness program prepared to develop phonological awareness skills of preschool children becomes important. In this way, attention will be drawn to the concept of phonological awareness in preschool period in Turkey and it will be an opportunity to change the existing misperception and to understand the significance of it. Moreover, despite of existence of various programs related to phonological awareness in abroad, it is not possible to apply these programs in Turkey because of the specific features of Turkish language in terms of phonological awareness. With this current study a curriculum focusing fully on phonological awareness skills is developed for preschool children by taking into account the Turkish language structure.

The aim of this study was to examine the effects of Colorful Worlds of Sounds Program on phonological awareness of preschool children. To reach that aim these research questions were asked:

1. Is there any significant difference between the pretest and posttest scores of control group taken from The Phonological Awareness Scale of Early Childhood Period?
2. Is there any significant difference between the pretest and posttest scores of the experimental group taken from The Phonological Awareness Scale of Early Childhood Period?
3. Is there any significant difference between the posttest scores of the experimental and the control group taken from The Phonological Awareness Scale of Early Childhood Period after the Colorful Worlds of Sounds Program is applied?

Limitations

This study is limited with the children who are 60-72 months of age, enrolled in an independent preschool depending on Ministry of Education in spring term of 2014-2015 academic year, showing normal development and do not participate any training related to phonological awareness. The measurement of phonological awareness skills of children in the sample is limited by The Phonological Awareness Scale of Early Childhood Period.

Method

Research Design

The study aiming to investigate the effects of Colorful Worlds of Sounds Program on phonological awareness skills of preschool children is designed in quasi-experimental pretest-posttest with control group. Teachers in the experimental and control groups were interviewed before they were assigned into groups concerning what they were doing for language development, how they were doing activities for reading and writing, and planning for phonological awareness. In addition, the activity plans prepared by the teachers for the term were also examined. As a result, it has been observed that the teachers in both the experimental group and the control group have not implemented a program for phonological awareness. In terms of these characteristics, the teachers have been equal. Pretest and posttest was applied to the experimental group and the control group to examine the effects of program implemented to the experimental group. Children in the control group did not take any training or participate in any program. It has been seen that the teacher in the control group included the sounds "e" and "i" in their plans regarding the indicator of "state the starting sound of the words" from "Gain 9: Shows awareness on phonetics. " concerning language development stated in the Preschool Education Program during the whole term. It has been observed that these plans are in the form of worksheets and that there is no any other practice during the term except these two activity plans for the Gain 9. After the pretest was applied to children in the experimental and the control group, Colorful Worlds of Sounds Program was implemented to the experimental group children by the researcher. The program implemented throughout eight weeks, three days in a week and an hour in a day. At the end of the implementation, posttest was applied to both the experimental and the control groups.

Study Group

Children enrolled in preschools depending on Ministry of Education stated in Eskisehir city center comprised the population of the study. In order to define the sample of the study preschools in which had classrooms having 20 or more children were defined. Classrooms having 20 or more children were mostly in independent preschools so an independent preschool was chosen by random sampling. In that preschool, there were four preschool classrooms that were enrolled with children at 60-72 months of age. The experimental and the control group were chosen from these four classrooms based on the willingness of teachers to implement the program on their classroom and whether there is any training similar to the program in the classroom or not. In that context, one afternoon classroom was chosen as experimental group and one morning classroom was chosen as control group. There were 24 children in the experimental group and 19 children in the control group.

Table 1. Demographic information belongs to children in the experimental and the control group

Features		**Experimental Group**		**Control Group**	
		Frequency (*f*)	Percent (%)	Frequency (*f*)	Percent (%)
Gender	Girl	13	54,2	11	57,9
	Boy	11	45,8	8	42,1
Number of Sibling	Only child	8	33,3	9	47,4
	Two-children	11	45,8	7	36,8
	There-children	4	16,7	2	10,5
	Four-children	1	4,2	1	5,3

Demographic information belongs to children in the experimental and the control group is stated in Table 1. As it is seen in Table 1. the experimental and the control group have similarity in term of gender and the number of sibling.

Table 2. Demographic information belongs to families of children in the experimental and the control group

Features		**Experimental Group**		**Control Group**	
		Frequency (*f*)	Percent (%)	Frequency (*f*)	Percent (%)
Mother education level	Primary school	0	0	0	0
	Secondary school	0	0	3	15,8
	College	7	29,2	4	21,1
	University	15	62,5	12	63,2
	Graduate education	2	8,3	0	0
Father education level	Primary school	0	0	1	5,3
	Secondary school	2	8,3	2	10,5
	College	8	33,3	3	15,8
	University	12	50,0	13	68,4
	Graduate education	2	8,3	0	0
Mother employment status	Employed	15	62,5	13	68,4
	Not employed	9	37,5	6	31,6
Father employment status	Employed	24	100,0	19	100,0
	Not employed	0	0	0	0
Family income	0-1200 Turkish Liras (TL)	0	0	0	0
	1201-2400 TL	5	20,8	5	26,3
	2401-3600 TL	9	37,5	7	36,8
	3601-4800 TL	2	8,3	2	10,5
	4801-6000 TL	5	20,8	4	21,0
	6001 TL and more	3	12,5	1	5,2

As it is seen in Table 2., it can be said that the experimental and the control group have similarity in terms of mother and father educational level, mother and father employment position and average level of family income.

Data collection tools

General Information Form and The Phonological Awareness Scale of Early Childhood Period were used as data collection tools.

General Information Form: General Information Form includes questions concerning age of children, gender, number of siblings, year of participating preschool education, education level of mother and father, employment status of mother and father, family income.

The Phonological Awareness Scale of Early Childhood Period (PASECP): The Phonological Awareness Scale of Early Childhood Period (PASECP) is developed by Sarı and Aktan Acar (2013) to measure phonological awareness. The norm study of (PASECP) was made by applying it to 733 children in the Marmara Region. The original language of the scale is Turkish. The scale includes eight subdimensions. First subdimension has 8 questions and the other subdimensions have 10 questions in each so there are totally 79 questions. The subdimensions of the scale are recognizing rhyme, beginning sound detection, generating new words related to the desired phoneme, grouping words starting with the same sound within a group of words, blending phonemes, segmenting word into its syllables, omitting a word in a compound and alphabet knowledge.

If answers given to the scale items are correct, they are coded as (1) and if not it is coded as (0). Test is administered to children individually. It takes about 15 minutes to administer for each children. Test-retest reliability coefficients of the scale changes between .975 and .433. Internal consistency reliability of total scores of the scale is between .9611 (Cronbach alpha) and .8474 (Guttman). Internal consistency reliability for each subdimensions is like that: recognizing rhyme is .822, beginning sound detection is .971, generating new words related to the desired phoneme is .864, grouping words starting with the same sound within a group of words is .867, blending phonemes is .783, segmenting word into its syllables is .902, omitting a word in a compound is .923 and alphabet knowledge is .930. These results show that the scale is reliable and valid to measure phonological awareness skills.

Some precautions were taken to provide internal validity. Hence time, practice setting, features of the children and demographic info belong to them were taken into account. Also, expert opinion was taken in every process of the study, pilot study was made and observations in the control group were made. Time may cause the dependent variable being influenced by other variables than the independent variables. As time elapses, the possibility of controlling undesirable variables may decrease. For this reason, in order to provide internal validity, the duration of the program was defined as 8 weeks both to reveal the effects of the program on the children and to control variables outside the independent variable. It is important that the children in the experimental and control groups should be trained in similar environments to reveal the effect of experimental studies. For this reason, when the experiment and control groups were assigned, two different classes with similar characteristics in the same school were selected. At the same time, both classes were receiving half-day training and educational materials in the classroom were similar. Also, children had similar demographic information (age, gender, number of siblings, parent and child education, parent and child occupation, occupation of mother and father, and monthly income). In addition, it was observed that children reside in the immediate vicinity of the school when their residence addresses are examined. In this context, it can be said that children have grown up in similar social and economic conditions. The activity plans of the Colorful Worlds of Sounds Program were presented to five experts in the field of early literacy, phonological awareness and preschool education and to one pre-school teacher who have many years of experience in the field to provide internal validity. After the expert opinions, the activity plans of the Colorful Worlds of Sounds Program were finalized by taking into consideration the feedbacks and suggestions. In addition, eight activities applied in another 5-year-old class in the same school that has similar characteristics to the experimental and control group. When these activities were chosen, two activities from each of the phases of word, syllable, rhyme, and phonemic awareness were taken. Following this pilot study, it was determined that the activities were suitable for children. In addition to the observations made in the control group, the teachers in the experimental and control groups were checked to see what was done to support the phonological awareness by examining the activity plans during the term.

Developing Colorful Worlds of Sounds Program

In the study, Colorful Worlds of Sounds Program was developed to improve phonological awareness skills of preschool children who are 60-72 months by reviewing theoretical and practical studies related to phonological awareness in the literature. After all of these reviews, by making connection with Ministry of Education 2013 Preschool Education Program activity plans prepared including mostly play, story, movement and music.

Activity plans of Colorful Worlds of Sounds Program covered definition of phonological awareness by including levels namely as word awareness, syllable awareness, rhyme awareness and phonemic awareness. Activities were prepared by paying attention to the complexity of every levels and tasks. There were 2 activity plans for word awareness, 6 for rhyme awareness, 5 for syllable awareness and 11 for phonemic awareness. As total 24 activity plans were prepared and for every section one activity was implemented. While deciding the number of the activity plans, scope and developmental order of phonological awareness skills, performance of children during the process and

difficulty level of the tasks belong to related awareness level were taken into account. In the program there were small group activities as well as big group activities. One of the activities in Colorful Worlds of Sounds Program can be seen below:

RHYME AWARENESS

Activity-6: Rhyme box

Activity type / method: Small group activity / Question & Answer, group discussion

Gains and Indicators

Linguistic Development

Gain 1: Recognizes the sounds.

Indicators: States the feature of the sound. States the similarities and differences between sounds.

Gain 9: Shows awareness on phonetics.

Indicators: State the rhyme in the poem, story and roll.

Indicators (new-rhyme awareness): State rhymed words among given words

Cognitive Development

Gain 8: Compare the features of the object or entities.

Indicators: Distinguish, compare sound of the object or entities.

Social Emotional Development

Gain 3: They express feelings and opinions about event or situation in unique ways.

Indicators: They tell feelings and opinions and reasons of them. They express feelings and opinions in unique ways.

Materials: rhymed picture cards

Learning process:

- Children are asked to create suns together. After saying 1,2,3, children are divided into three groups.
- Each group is given 4 cards. These cards have pictures of various objects on them. Attention is paid to the fact that object names on 3 cards of the 4 cards given to the groups should be rhymed and 1 of them should not be rhymed.
- The groups sit in the form of a circle close to each other.
- When teacher music is turned on, everyone gives their cards to the side, so the cards go around in hand.
- Be careful to have one card in each child at any moment.
- When the music stops, the children open the face of the cards leaving the cards around.
- Each group tells what their objects are on their cards for their group and examines them for rhyming.
- The teacher counts to three and ask children to raise the object cards that does not rhyme with other cards. Then the children animate about the objects on this card. Again the names of the objects found on all the cards are told and the rhyming ones are gathered together.

Assessment: Children are asked to animate an object found on the cards. It is also desirable for each child to say a word rhyming while asking what is the object s/he animates. If the child cannot answer, it is thought with the other children in the class.

Note: The number of rhyming words can be increased according to the class size. In addition to the words given in the materials example, non-rhyming word combinations can also be made according to class size.

Implementation of Colorful Worlds of Sounds Program

Colorful Worlds of Sounds Program implemented children throughout eight weeks, three days in a week and an hour in a day as total 24 sections. Every section lasted about 40 to 60 minutes. While implementing activities, as a warmup activity riddles, rhymes and finger plays were used. Also, during the implementation of the activities some educational techniques like lectures, questions and answers, group discussions, brainstorming, educational exercises and games were used. Moreover, video presentation, story books, matching cards, boxes, envelopes, photographs of objects and puppets were the materials used in the activities. After the implementation of the activities, assesment of them was made and opinions of children regarding activities were taken.

Data Analysis

Firstly, assumptions to make parametric tests were checked. Also, homogeneous group variance was examined to be able to make comparison between the experimental and the control group. Data was analyzed to test the homogeneity of variance by Levene statistics (Büyüköztürk, 2014; Field, 2005). Because of the p value is greater than .05 ($p>.05$) it can be interpreted as that variances were not significantly different. In other words, group variances were homogenous. Dependent sample t test was used to reveal whether there is a significant difference between the pretest and posttest scores of the control group or not. Because of the high number of comparisons, Bonferroni Adjustment (Akbulut, 2010) was applied so new p value was defined as .0055. 2x2 mixed ANOVA was used to reveal whether there is a significant difference between the pretest and posttest total phonological awareness scores of the experimental and the control group. Moreover, 2x2 mixed ANOVA was used to compare pretest and posttest scores obtained from the subdimensions. Effect size (η^2) was used to define the effects of independent variable on dependent variables. Effect size (η^2) is small if it is between .01- .06, medium if it is .06 and more, and big if it is .14 or more (Büyüköztürk, 2014, p. 44; Cohen, 1988).

Results

Comparisons of Control Group's Pretest-Posttest Phonological Awareness Scores

Dependent sample t test was used to reveal whether there is a significant difference between the pretest and posttest total phonological awareness scores of the control group or not. Table 3. shows dependent sample t test results of the control group regarding pretest-posttest total phonological awareness scores and scores of subdimensions.

Table 3. Dependent Sample t Test Results of the Control Group Regarding Pretest-Posttest Total and Subdimensions Phonological Awareness Scores

Scale Dimensions	Measurement Time	N	$\overline{X}$	SD	df	T	p<
Total phonological awareness score	Pretest	19	28,10	11,459	18	-,834	,415
	Posttest	19	29,89	9,876			
Recognizing rhyme	Pretest	19	3,68	2,730	18	-,740	,469
	Posttest	19	4,11	2,514			

Table 3. Continued

Scale Dimensions	Measurement Time	N	$\bar{X}$	SD	df	T	p<
Beginning sound detection	Pretest	19	2,53	2,065	18	1,585	,130
	Posttest	19	1,68	1,416			
Generating new words related to the desired phoneme	Pretest	19	3,53	1,926	18	,889	,385
	Posttest	19	3,11	1,761			
Grouping words starting with the same sound within a group of words	Pretest	19	3,05	1,615	18	-4,025	,006
	Posttest	19	5,11	2,846			
Blending phonemes	Pretest	19	1,79	1,782	18	-2,927	,009
	Posttest	19	3,05	1,615			
Segmenting word into its syllables	Pretest	19	5,37	3,235	18	-,320	,752
	Posttest	19	5,68	2,770			
Omitting a word in a compound	Pretest	19	5,53	3,186	18	-,747	,465
	Posttest	19	5,95	3,566			
Alphabet knowledge	Pretest	19	,89	1,883	18	-1,000	,331
	Posttest	19	1,11	1,696			

There was not a significant difference between control group's pretest and posttest mean score of recognizing rhyme (t(18)= -,740, p=,469), beginning sound detection t(18)= 1,585, p=,130), generating new words related to the desired phoneme (t(18)= ,889, p=,385), grouping words starting with the same sound within a group of words (t(18)= -4,025, p=,006), blending phonemes (t(18)= -2,927, p=,009), segmenting word into its syllables (t(18)= -,320, p=,752), omitting a word in a compound (t(18)= -,747, p=,465) and alphabet knowledge (t(18)= -1,000, p=,331).

The Effects of Colorful World of Sounds Program on Total Phonological Awareness Scores of the Experimental and the Control Group

2x2 mixed ANOVA was used to reveal whether there is a significant difference between the pretest and posttest total phonological awareness scores of the experimental and the control group or not.

Descriptive values in different measurement times belong to the experimental and the control group regarding phonological awareness total scores are shown in Table 4.

Table 4. Descriptive Values of the Experimental and the Control Group's Total Phonological Awareness Scores

	Groups	N	$\bar{X}$	SD	SE
Pretest	Experimental	24	29,41	14,45	2,94
	Control	19	28,10	11,45	2,62
	Total	43	28,83	13,08	1,99
Posttest	Experimental	24	58,16	10,18	2,07
	Control	19	29,89	9,87	2,26
	Total	43	45,67	17,33	2,64

As seen in the Table 4., while the mean total phonological awareness pretest scores of the experimental group was 29,41 and then it was 58,16 in the posttest. The mean total phonological awareness pretest scores of the control group was 28,10 and then it was 29,89 in the posttest. It is seen that whereas there was a considerable increase in the mean total phonological awareness scores of the experimental group, it is so small in that of the control group.

In Table 5., ANOVA results of pretest-posttest total phonological awareness scores of the experimental and the control group are shown.

Table 5. ANOVA Results of Pretest-Posttest Total Phonological Awareness Scores of the Experimental and the Control Group

Source of Variance	SS	df	MS	F	p<	η^2
Between groups						
Groups	4640,455	1	4640,455	20,489	0,001	0,332
Error	9285,917	41	226,486			
Within groups						
Measurement time	4945,264	1	4945,264	100,135	0,000	0,456
Measurement*group	3854,101	1	3854,101	78,040	0,000	0,356
Error	2024,829	41	49,386			
Total	24750,566	85				

SS: Sum of Squares, df: Degrees of Freedom, MS: Means of Squares, η2: Effect Size

When the ANOVA summary table is examined, it is seen that measurement time and group factors affected total phonological awareness in interaction and $\eta 2$ is large (F=78,040, p<.001, η2=0,356). The source of this interaction is shown in Figure 1.

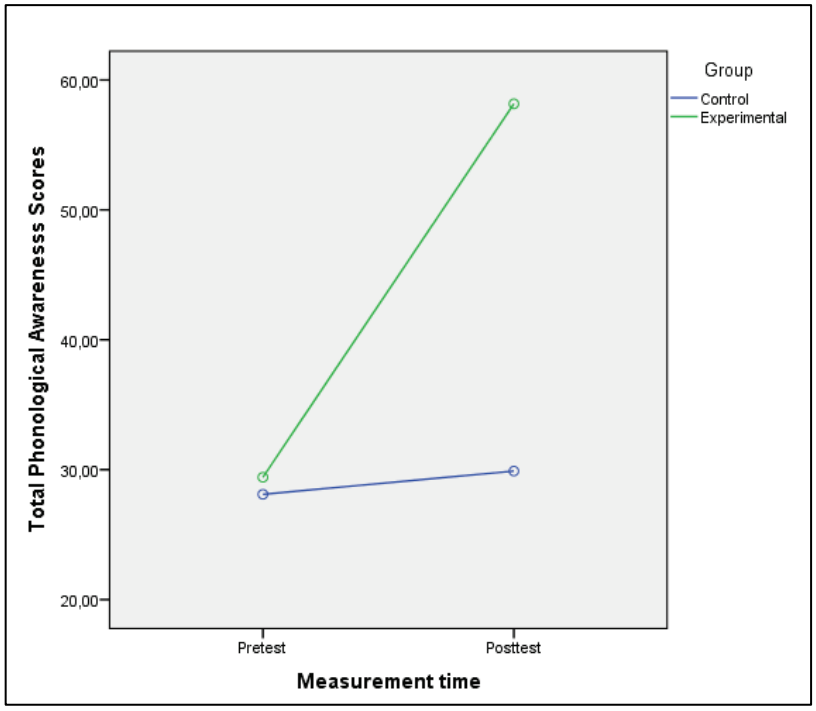

Figure 1. The Effects of Colorful Worlds of Sounds Program on Total Phonological Awareness Scores of the Experimental and the Control Group

As shown in Figure 1., whereas the increase in the mean total phonological awareness pretest-posttest scores of the experimental group was 27,75 after the implementation of Colorful Worlds of Sounds Program, the increase in the mean total phonological awareness pretest-posttest scores of the control group was 1,79. It can be inferred from these findings that the program was effective to increase phonological awareness scores of the experimental group.

The Effects of Colorful World of Sounds Program on Subdimensions Scores of the Experimental and the Control Group

Comparisons of the groups in terms of each subdimensions of The Phonological Awareness Scale of Early Childhood Period (PASECP) were made.

Results of the analysis regarding whether there is a significant difference between recognizing rhyme scores belong to different measurement times or not are shown in Table 6. and Table 7.

Table 6. Descriptive Values of the Experimental and the Control Group's Recognizing Rhyme Scores

	Groups	**N**	$\overline{X}$	**SD**	**SE**
Pretest	Experimental	24	3,21	2,65	0,54
	Control	19	3,68	2,73	0,62
	Total	43	3,42	2,66	0,40
Posttest	Experimental	24	6,92	1,24	0,25
	Control	19	4,11	2,51	0,57
	Total	43	5,67	2,35	0,35

As seen in the Table 6., while the mean recognizing rhyme pretest scores of the experimental group was 3,21 and then it was 6,92 in the posttest. The mean recognizing rhyme pretest scores of the control group was 3,68, and then it was 4,11 in the posttest. Whereas the increase in the mean recognizing rhyme pretest-posttest scores of the experimental group was 3,71, the increase in the mean recognizing rhyme pretest-posttest scores of the control group was 0,43.

In Table 7., ANOVA results of pretest-posttest recognizing rhyme scores of the experimental and the control group are shown.

Table 7. ANOVA Results of Pretest-Posttest Recognizing Rhyme Scores of the Experimental and the Control Group

Source of Variance	**SS**	**df**	**MS**	**F**	**p<**	η^2
Between groups						
Groups	28,923	1	28,923	3,790	,058	0,084
Error	312,891	41	7,631			
Within groups						
Measurement time	90,414	1	90,414	27,915	0,001	0,322
Measurement*group	57,298	1	57,298	17,691	0,001	0,204
Error	132,795	41	3,239			
Total	622,321	85				

SS: Sum of Squares, df: Degrees of Freedom, MS: Means of Squares, η2: Effect Size

When the ANOVA summary table is examined, it is seen that measurement time and group factors affected recognizing rhyme scores in interaction and η^2 is large (F=17,691, p<.001, η^2=0,204).

Results of the analysis regarding whether there is a significant difference between beginning sound detection scores belong to different measurement times or not are shown in Table 8. and Table 9.

Table 8. Descriptive Values of the Experimental and the Control Group's Beginning Sound Detection Scores

	Groups	N	$\overline{X}$	SD	SE
Pretest	Experimental	24	2,42	2,53	0,51
	Control	19	2,53	2,06	0,47
	Total	43	2,47	2,31	0,35
Posttest	Experimental	24	7,67	2,20	0,44
	Control	19	1,68	1,41	0,32
	Total	43	5,02	3,54	0,53

As seen in the Table 8., while the mean beginning sound detection pretest scores of the experimental group was 2,42 and then it was 7,67 in the posttest. The mean beginning sound detection pretest scores of the control group was 2,53, and then it was 1,68 in the posttest. Whereas the increase in the mean beginning sound detection pretest-posttest scores of the experimental group was 5,25, there was 0,85 decrease in the mean beginning sound detection pretest-posttest scores of the control group.

In Table 9., ANOVA results of pretest-posttest beginning sound detection scores of the experimental and the control group are shown.

Table 9. ANOVA Results of Pretest-Posttest Beginning Sound Detection Scores of the Experimental and the Control Group

Source of Variance	SS	df	MS	F	p<	η^2
Between groups						
Groups	182,876	1	182,876	32,112	0,001	0,439
Error	233,496	41	5,695			
Within groups						
Measurement time	103,022	1	103,022	30,495	0,001	0,235
Measurement*group	196,789	1	196,789	58,250	0,000	0,448
Error	138,513	41	3,378			
Total	854,696	85				

SS: Sum of Squares, df: Degrees of Freedom, MS: Means of Squares, η2: Effect Size

When the ANOVA summary table is examined, it is seen that measurement time and group factors affected beginning sound detection scores in interaction and η^2 is large (F=58,250, p<.000, η^2=0,448).

Results of the analysis regarding whether there is a significant difference between generating new words related to the desired phoneme scores belong to different measurement times or not are shown in Table 10. and Table 11.

Table 10. Descriptive Values of the Experimental and the Control Group's Generating New Words Related to the Desired Phoneme Scores

	Groups	N	$\overline{X}$	SD	SE
Pretest	Experimental	24	3,33	2,58	0,52
	Control	19	3,53	1,92	0,44
	Total	43	3,42	2,29	0,34
Posttest	Experimental	24	7,29	2,75	0,56
	Control	19	3,11	1,76	0,40
	Total	43	5,44	3,14	0,47

As seen in the Table 10., while the mean generating new words related to the desired phoneme pretest scores of the experimental group was 3,33 and then it was 7,29 in the posttest. The mean generating new words related to the desired phoneme pretest scores of the control group was 3,53, and then it was 3,11 in the posttest. Whereas the increase in the mean generating new words related to the desired phoneme pretest-posttest scores of the experimental group was 3,96, there was 0,42 decrease in the mean generating new words related to the desired phoneme pretest-posttest scores of the control group.

In Table 11., ANOVA results of pretest-posttest generating new words related to the desired phoneme scores of the experimental and the control group are shown.

Table 11. ANOVA Results of Pretest-Posttest Generating New Words Related to the Desired Phoneme Scores of the Experimental and the Control Group

Source of Variance	SS	df	MS	F	p<	η^2
Between groups						
Groups	84,558	1		84,558	11,594	,001
Error	299,023	41		7,293		
Within groups						
Measurement time	66,345	1		66,345	17,920	0,001
Measurement*group	101,693	1		101,693	27,468	0,001
Error	151,795	41		3,702		
Total	703,414	85				

SS: Sum of Squares, df: Degrees of Freedom, MS: Means of Squares, η2: Effect Size

When the ANOVA summary table is examined, it is seen that measurement time and group factors affected generating new words related to the desired phoneme scores in interaction and η^2 is large (F=27,468, p<.000, η^2=0,317).

Results of the analysis regarding whether there is a significant difference between grouping words starting with the same sound within a group of words, scores belong to different measurement times or not are shown in Table 12. and Table 13.

Table 12. Descriptive Values of the Experimental and the Control Group's Grouping Words Starting with the Same Sound within a Group of Words Scores

	Groups	N	$\overline{X}$	SD	SE
Pretest	Experimental	24	3,00	1,50	0,30
	Control	19	3,05	1,61	0,36
	Total	43	3,02	1,53	0,23
Posttest	Experimental	24	8,79	1,47	0,30
	Control	19	5,11	2,84	0,65
	Total	43	7,16	2,84	0,43

As seen in the Table 12., while the mean grouping words starting with the same sound within a group of words pretest scores of the experimental group was 3,00 and then it was 8,79 in the posttest. The mean grouping words starting with the same sound within a group of words pretest scores of the control group was 3,05, and then it was 5,11 in the posttest. Whereas the increase in the mean grouping words starting with the same sound within a group of words pretest-posttest scores of the experimental group is 5,79, it was 2,06 in that of the control group.

In Table 13., ANOVA results of pretest-posttest grouping words starting with the same sound within a group of words scores of the experimental and the control group are shown.

Table 13. ANOVA Results of Pretest-Posttest Grouping Words Starting with the Same Sound within a Group of Words Scores of the Experimental and the Control Group

Source of Variance	SS	df	MS	F	p<	η^2
Between groups						
Groups	70,013	1	70,013	13,851	,001	0,252
Error	207,242	41	5,055			
Within groups						
Measurement time	326,268	1	326,268	152,962	0,000	0,668
Measurement*group	74,129	1	74,129	34,753	0,001	0,151
Error	87,453	41	2,133			
Total	765,105	85				

SS: Sum of Squares, df: Degrees of Freedom, MS: Means of Squares, η2: Effect Size

When the ANOVA summary table is examined, it is seen that measurement time and group factors affected grouping words starting with the same sound within a group of words scores in interaction and η^2 is large (F=34,753, p<.001, η^2=0,151).

Results of the analysis regarding whether there is a significant difference between blending phonemes scores belong to different measurement times or not are shown in Table 14. and Table 15.

Table 14. Descriptive Values of the Experimental and the Control Group's Blending Phonemes Scores

	Groups	N	$\overline{X}$	SD	SE
Pretest	Experimental	24	1,96	1,57	0,32
	Control	19	1,79	1,78	0,40
	Total	43	1,88	1,65	0,25
Posttest	Experimental	24	6,83	1,85	*,37
	Control	19	3,05	1,61	0,36
	Total	43	5,16	2,57	0,39

As seen in the Table 14., while the mean blending phonemes pretest scores of the experimental group was 1,96 and then it was 6,83 in the posttest. The mean blending phonemes pretest scores of the control group was 1,79, and then it was 3,05 in the posttest. Whereas the increase in the mean blending phonemes pretest-posttest scores of the experimental group was 4,87, it was 1,26 in that of the control group.

In Table 15., ANOVA results of pretest-posttest blending phonemes scores of the experimental and the control group are shown.

Table 15. ANOVA Results of Pretest-Posttest Blending Phonemes Scores of the Experimental and the Control Group

Source of Variance	SS	df	MS	F	p<	η^2
Between groups						
Groups	985,595	1	985,595	224,195	,000	0,845
Error	180,242	41	4,396			
Within groups						
Measurement time	199,776	1	199,776	136,162	0,000	0,607
Measurement*group	69,171	1	69,171	47,145	0,000	0,210
Error	60,155	41	1,467			
Total	1494,939	85				

SS: Sum of Squares, df: Degrees of Freedom, MS: Means of Squares, η2: Effect Size

When the ANOVA summary table is examined, it is seen that measurement time and group factors affected blending phonemes scores in interaction and η^2 is large (F=47,145, p<.000, η^2=0,210).

Results of the analysis regarding whether there is a significant difference between segmenting word into its syllables scores belong to different measurement times or not are shown in Table 16. and Table 17.

Table 16. Descriptive Values of the Experimental and the Control Group's Segmenting Word into Its Syllables Scores

	Groups	**N**	$\overline{X}$	**SD**	**SE**
Pretest	Experimental	24	6,00	,79	0,56
	Control	19	5,37	,23	0,74
	Total	43	5,72	,97	0,45
Posttest	Experimental	24	8,92	,31	0,26
	Control	19	5,68	,77	0,63
	Total	43	7,49	,62	0,39

As seen in the Table 16., while the mean segmenting word into its syllables scores pretest scores of the experimental group was 6,00 and then it was 8,92 in the posttest. The mean segmenting word into its syllables scores pretest scores of the control group was 5,37 and then it was 5,68 in the posttest. Whereas the increase in the mean segmenting word into its syllables scores pretest-posttest scores of the experimental group was 2,92, it is 0,32 in that of the control group.

In Table 17., ANOVA results of pretest-posttest segmenting word into its syllables scores of the experimental and the control group are shown.

Table 17. ANOVA Results of Pretest-Posttest Segmenting Word into Its Syllables Scores of the Experimental and the Control Group

Source of Variance	**SS**	**df**	**MS**	**F**	**p<**	η^2
Between groups						
Groups	79,168	1	79,168	10,525	,002	0,204
Error	308,390	41	7,522			
Within groups						
Measurement time	55,403	1	55,403	9,545	0,004	0,168
Measurement*group	35,868	1	35,868	6,180	0,017	0,108
Error	237,969	41	5,804			
Total	716,798	85				

SS: Sum of Squares, df: Degrees of Freedom, MS: Means of Squares, η2: Effect Size

When the ANOVA summary table is examined, it is seen that measurement time and group factors affected segmenting word into its syllables scores in interaction and η^2 is medium (F=6,180, p<.017, η^2=0,108).

Results of the analysis regarding whether there is a significant difference between omitting a word in a compound scores belong to different measurement times or not are shown in Table 18. and Table 19.

Table 18. Descriptive Values of the Experimental and the Control Group's Omitting a Word in a Compound Scores

	Groups	N	$\overline{X}$	SD	SE
Pretest	Experimental	24	5,54	3,40	0,69
	Control	19	5,53	3,18	0,72
	Total	43	5,53	3,26	0,49
Posttest	Experimental	24	8,88	2,02	0,41
	Control	19	5,95	3,56	0,81
	Total	43	7,58	3,14	0,47

As seen in the Table 18., while the mean omitting a word in a compound scores pretest scores of the experimental group was 5,54 and then it was 8,88 in the posttest. The mean omitting a word in a compound scores pretest scores of the control group was 5,53 and then it was 5,95 in the posttest. Whereas the increase in the mean omitting a word in a compound scores pretest-posttest scores of the experimental group was 3,34, it was 0,42 in that of the control group.

In Table 19., ANOVA results of pretest-posttest omitting a word in a compound scores of the experimental and the control group are shown.

Table 19. ANOVA Results of Pretest-Posttest Segmenting Word into Its Syllables Scores of the Experimental and the Control Group

Source of Variance	SS	df	MS	F	p<	η^2
Between groups						
Groups	45,924	1	45,924	3,045	,088	0,069
Error	618,285	41	15,080			
Within groups						
Measurement time	74,738	1	74,738	19,900	0,001	0,273
Measurement*group	44,971	1	44,971	11,974	0,001	0,016
Error	153,982	41	3,756			
Total	937,900	85				

SS: Sum of Squares, df: Degrees of Freedom, MS: Means of Squares, η2: Effect Size

When the ANOVA summary table is examined, it is seen that measurement time and group factors affected omitting a word in a compound scores in interaction (F=11,974, p<.001, η^2=0,016).

Results of the analysis regarding whether there is a significant difference between alphabet knowledge scores belong to different measurement times or not are shown in Table 20. and Table 21.

Table 20. Descriptive Values of the Experimental and the Control Group's Alphabet Knowledge Scores

	Groups	N	$\overline{X}$	SD	SE
Pretest	Experimental	24	1,75	2,81	0,57
	Control	19	0,89	1,88	0,43
	Total	43	1,37	2,45	0,37
Posttest	Experimental	24	2,88	3,40	0,69
	Control	19	1,11	1,69	0,38
	Total	43	2,09	2,89	0,44

As seen in the Table 20., while the mean alphabet knowledge scores pretest scores of the experimental group was 1,75 and then it was 2,88 in the posttest. The mean alphabet knowledge scores pretest scores of the control group was 0,89 and then it was 1,11 in the posttest. Whereas the increase in the mean alphabet knowledge scores pretest-posttest scores of the experimental group was 1,13, it was 0,22 in that of the control group.

In Table 21., ANOVA results of pretest-posttest alphabet knowledge scores of the experimental and the control group are shown.

Table 21. ANOVA Results of Pretest-Posttest Alphabet Knowledge Scores of the Experimental and the Control Group

Source of Variance	SS	df	MS	F	p<	η^2
Between groups						
Groups	36,536	1	36,536	2,838	,099	0,064
Error	527,813	41	12,873			
Within groups						
Measurement time	9,457	1	9,457	10,511	0,02	0,186
Measurement*group	4,434	1	4,434	4,928	0,03	0,087
Error	36,891	41	0,900			
Total	615,131	85				

SS: Sum of Squares, df: Degrees of Freedom, MS: Means of Squares, η2: Effect Size

When the ANOVA summary table is examined, it is seen that measurement time and group factors affected alphabet knowledge scores in interaction (F=4,928, p<.003, η^2=0,087).

Conclusion and Discussion

The results of the study indicated that activities of Colorful Worlds of Sounds Program is effective to increase the score of total phonological awareness belong to the experimental group. This result is similar with the findings of the other studies examining the effects of phonological awareness training and studies concerning intervention programs (Ball & Blachman, 1991; Bayraktar & Temel, 2014; Bradley & Bryant, 1983; Lefebvre, Trudeau, & Suttun, 2011; Lovett, Lacerenza, & Borden, 2000; Lundberg, Frost, & Peterson, 1988; Lundberg, Larsman, & Strid, 2012; Phelps, 2003; Richgels, Poremba, & McGee, 1996; Schneider, Kuspert, Roth, Vise, & Marx, 1997; Suortti & Lipponen, 2014; Tyler, Osterhouse, Wickham, Mcnutt, & Shao, 2014; Ukrainetz, Nuspl, Wilkerson, & Beddes, 2011).

Colorful World of Sounds Program is effective to increase the scores of recognizing rhyme of the experimental group. Rhyming awareness skills are crucial because they support the development of early reading and writing skills (Bowey & Francis, 1991; Bryant et al., 1990; Ecenbarger, 2006). It is known that the sensitivity to rhyming supports reading both directly and indirectly. While children are directly supported for rhyme awareness, they are taught that words can have same sounds and same alphabetical order. Children's developing sensitivity to the knowledge that alphabetical order of the common letters in the words can be same support the development of reading strategies. As indirectly, while analyzing the word, the discrimination of rhyme encourages to make small analysis starting from the internal structural parts of a word. For example, it sets a ground for segmentation process from syllable part of a word to phoneme indirectly (Ecenbarger, 2006; Gillon, 2007; Goswami & Bryant, 1990; Hempenstall, 2002; Van Kleeck, Gillam, & McFadden, 1998). In Colorful World of Sounds Program, rhymes and poems were used in the beginning activities related to rhyme awareness. The emphasis on rhymes and that children know by heart, and the use of story books including especially rhyming words, have improved this awareness. After the initial activities, this skill has been reinforced through the use of real objects and object cards, which are rhyming with each other, as well as educational games for grouping rhyming and non-rhyming words. Studies shows that children who take training developed their ability to recognize rhyme (Bradley & Bryant, 1983; Hogan, Catts, & Little, 2005;

Lefebvre et al., 2011; Lundberg et al., 2012; Nancollis, Lawri, & Dodd, 2005; Richgels et al., 1996). Although rhyme awareness seems is a skill acquired between the ages of three to six, it is necessary to go beyond the language's being means of speaking and to perceive it in an abstract way for recognizing rhyme. For this reason, some of the rhyme-related tasks may still be a problem for some kindergarten and first-grade children (Gunning, 2000). For example, rhyme generation is the hardest rhyme awareness tasks because in order to achieve this task, skill like rhyme recognition and rhyme detection should be developed well. Colorful World of Sounds Program aimed to recognize and detect rhymes for rhyme awareness so rhyme generation was not focused so much, it is just included in some parts of the assessment of the rhyme activities.

Moreover, Colorful World of Sounds Program is effective to increase the scores of beginning sound detection of the experimental group. Beginning sound detection task is the simplest tasks of phonemic awareness (Ecenbarger, 2006; Gillon, 20007; Hempenstall, 2002). Phoneme or phonemic awareness is one of strongest predictors of reading writing performance (Hoien, Lundberg, Stanovich, & Bjaalid, 1995; Stanovich, 2000). Many of the activities in the Colorful World of Sounds Program are based on phoneme isolation because it is the basis for recognizing the last sound in phonemic awareness, grouping words starting with the same sound within a group of words, detecting words starting with different sounds, and generating new words starting with the desired phoneme. This skill was developed by using puppets, songs and games, lectures, picture cards of objects starting with various sounds. The result of the study is supported by the other studies (Ehri et al., 2001; Lefebvre et al., 2011; Tyler et al., 2014; Ouedans, 2003). In the beginning activities, in terms of language structure of Turkish, giving priority to the continuant consonants (f, m, n, r, s, ş, z) which can be distinguished more easily than other phonemes make it easier for children to detect phonemes and to understand the logic. This skill has also been reinforced by matching picture cards of objects that begin with the same phoneme.

Another result of the study is that Colorful World of Sounds Program is effective to increase the scores of generating new words related to the desired phoneme of the experimental group. Generating new words related to the desired phoneme is included as a task in phonemic awareness level of phonological awareness. Phonemic awareness skills such as generating new words related to the desired phoneme, detecting first and last phoneme can be acquired in children at 5-6 years of age (Ecenbarger, 2006). Half of the children at three years of age can begin to detect first phoneme (Chaney, 1992; Maclean, Bryant, & Bradley, 1987) and one third of children at the age of four can perform tasks related to phoneme matching (Lonigan, Burgess, Anthony, & Baker, 1998). This can be inferred that phonemic awareness can be improved with education given to preschool children. Relevant study results in the literature are also parallel to this finding (Ehri et al., 2001; Lefebvre et al., 2011; Lundberg et al., 2012; Tyler et al., 2014; Oudeans, 2003). This skill has been developed with educational games in which boxes, envelopes, picture cards are used in related activities of the Colorful World of Sounds Program. It was also found that activities related to the first phoneme detection in the program were the basis for this task.

According to the results of the study, Colorful World of Sounds Program leads a significant difference in favor of the experimental group by developing grouping words starting with the same sound within a group of words skills. Although the program has only two activities related to this task, it is considered that the activities applied in relation to the first phoneme detection were effective in the success of the children. In the prepared activities, the children were divided into small groups and they were able to acquire these skills through group discussions of picture cards of objects starting with different phonemes. This result is in agreement with other studies in the literature and shows phonemic awareness can be developed (Bradley & Bryant, 1985; Bayraktar, 2013; Lundberg et al., 1988; Lundberg et al., 2012; Lundberg et al., 1980). However, the study results of Liberman, Shankweiler, Fischer, and Carter (1974) and Raisor (2006) showed opposite to this result. In these studies, there was no difference between the experimental and the control group in terms of grouping words starting with the same sound within a group of words. It can be derived from developmental reasons because the ages of the

children in the study was younger than five so that children may have difficulty in phonemic awareness level. It is known that first sound detection task of phonemic awareness develops better mostly children older than five years of age (Gillon, 2007; McGee, 2005; Ukrainetz, 2006).

Also, Colorful World of Sounds Program is effective to increase the scores of blending phonemes of the experimental group. Blending phonemes is one of the tasks of phonemic awareness. Phonemic awareness has an important place in terms of reading skills and writing. This is because sound characteristics of a spoken language are encoded by phonemic awareness. In this way, the basis for the alphabetical development that is necessary to comprehend written is established. Children who can solve by analyzing verbal language, use it to understand and solve the logic of written language (Hempenstall, 1997). There are two important prerequisites for acquiring the phonemic awareness that is prerequisite skills of reading. These are phonemic analysis and phonemic synthesis. Phonemic analysis defines as voicing phonemes by distinguished one by one so it is a very difficult skill. In studies, it has been shown that the synthesis skills have improved before the analysis skills (Bryen & Gerber, 1987; Caravolas & Bruck, 1993; Solomons, 1992; Torgesen et al., 1992; Yopp, 1988). Phoneme blending task included into Colorful World of Sounds Program for several reasons. As stated phoneme blending is one of the prerequisite of reading (Vaughn et al., 2008) and it is an easy task compared to phoneme segmenting. In addition to these, it is seen from the study of Sarı and Aktan Acar (2013) working with large number of children that phoneme blending can be achieved by Turkish children. In program, as beginning activities words consisting of two phonemes were selected and Legos or blocks were used to make concrete phonemes. It was said children that every Lego corresponds to a phoneme / sound. For instances, for "ip" word, one Lego is put forward for /i/ phoneme by sounding the phoneme and after two seconds another Lego is put forward for /p/ phoneme by sounding the phoneme. Then children are asked what is this word. It is important to make sure that the sounds of the phonemes are uttered. After gaining experience with the words consisting of two phonemes, this practice was continued with monosyllable words consisting of three phonemes. In later activities, children could do phoneme blending by using their phonological memories without needing any concrete material. However, it was seen that most of the children could not complete phoneme blending task including words consisting of four phonemes. This skill can be developed according to the results of the research as observed in the program process. Other study results also proved that blending phoneme skills can be supported with a training (Cassady & Smith, 2004; Daly, Chafouleas, Persampieri, Bonfiglio, & LaFleur, 2004; Daly, Johnson, & LeClair, 2009; Ouedans, 2003; Suortti & Lipponen, 2014; Tyler et al., 2014). However, phoneme blending task is much more difficult compared to phoneme detection task for children between five and seven years of age (Stahl & Murray, 1994). Yopp (1988) indicated that the difficulties of these tasks are related to phonological short term memory. Also, it is stated that this task can be developed more developmentally during primary school or later (Ecenbarger, 2006; Hempenstall, 1997; Olson, Wise, Conners, Rack, & Fulker, 1989; Rack, Hulme, & Snowling, 1993).

Colorful World of Sounds Program is effective to increase the scores of segmenting word into its syllables of the experimental group Syllable awareness is one of the crucial skills affecting phonological awareness (Anthony et al., 2002; Wagner et al., 1994). Syllable awareness was developed with activities related to syllable segmentation, syllable counting, syllable detection and syllable completion tasks using puppets, picture cards of objects and through educational games. Dividing syllables by applauding made syllable segmentation and syllable counting easier by embodying syllables. Other study results are in agreement with this result indicating segmenting word into its syllables skills can be developed by trainings (Ball & Blachman, 1991; Bayraktar, 2013; Bradley & Bryant, 1983; Hogan et al., 2005; Lefebvre et al., 2011; Lundberg et al., 2012; Silva & Martin, 2003; Schneider et al., 1997; Richgels et al., 1996; Ukrainetz et al., 2011). It is stated that syllable segmentation is crucial for attaining phonemic awareness because through syllable segmentation words divided into smaller parts and then comprehending that syllables can be divided into phonemes gets easier. Thus, it is suggested that in a phonological awareness training program firstly omitting a word/ syllable in a compound task should be worked in order to teach phonemic awareness (Gillon, 2006; Phillips, Clancy-Menchetti, & Lonigan, 2008; Schuele & Boudreau, 2008).

At the same time, Colorful World of Sounds Program is effective to increase the scores of omitting a word in a compound of the experimental group. Word awareness is the basis for syllable awareness (Ecenbarger, 2006; Hempenstall, 2002). This dimension is one of the word awareness tasks and in the PASECP word awareness is only measured by omitting an initial or final word in a compound task and omitting a syllable in the word is not in that scope (e.g. Say "sunflower" and now say this without "flower"). It is stated that this task provides children to recognize words in the compound words (Beauchat, Blamey, & Walpole, 2010). Colorful World of Sounds Program supported word awareness of children through story book review, word hopscotch by beginning activities focusing on dividing sentences to words. In the following activities, picture cards of compound words and picture cards of words of consisting the compound word were used to make the task concrete. For instance, picture card of "football", "foot" and "ball" was prepared. If children have difficulties to achieve this tasks, it is stated that this can be important sign of problems related to phonological awareness (Lane & Pullen, 2004).

Last result of the research is that Colorful World of Sounds Program is effective to increase the scores of alphabet knowledge of the experimental group. This result is aligned with the other research findings (Hogan et al., 2005; Oudeans, 2003). Alphabet knowledge is not a dimension pf phonological awareness but it has been used to measure phonological awareness (Bekman, 1998; Dodd, Crosbie, McIntosh, Teitzel, & Ozanne, 2000; Justice, Invernizzi, & Meier, 2002). Children need to remember the alphabetic structure and to spell written words to read and write (Torgesen, Al Otaiba, & Grek, 2005). It is suggested that phonological awareness programs should include alphabet and phoneme knowledge (Gillon, 2007). The meta-analysis study of Ehri et al. (2001) on phonological awareness training programs indicated that it is so important to include alphabet knowledge into the phonemic awareness activities to attain reading and writing. Yet, no activity related to alphabet knowledge had been planned in the Colorful World of Sounds Program. While uttering the phonemes during the activities related to beginning sound detection, generating new words related to the desired phoneme and grouping words starting with the same sound within a group of word, picture cards of upper and lower cases were introduced. However, after these any practice was not made. It was aimed to visually recognize letter-sound relation like as in environmental print. Children connect knowledge about sound structures of word composing a language and written forms of these sounds. It is known that the phonological awareness training provided by linking alphabet knowledge is more effective than the trainings made it without alphabet knowledge (Hatcher, Hulme, & Ellis, 1994).

Suggestions

In this study, it is aimed to investigate the effects of Colorful Worlds of Sounds Program on phonological awareness skills of preschool children. However, the effects of phonological awareness training on children's word knowledge, alphabet and letter knowledge, writing awareness and language skills can be examined with different researches. Depending on the findings of the study, further studies can investigate which subdimension predicts more the phonological awareness. This can reveal that which tasks should be given more attention while preparing curriculum contents concerning phonological awareness. It is known that phonological awareness predicts children' long-term reading skills. Thus, effects of training given in preschool period on speed of reading in primary school, vocabulary knowledge, alphabet and letter knowledge, reading comprehension and reading fluency can be investigated with longitudinal studies. Also, by giving phonological awareness training to preschool teachers and families, the effects of these on children can be examined. In this study, the program just focused on phonological awareness skills and tasks belongs to these skills. Yet, programs can be prepared by including phonological processing skills development and the effects of these can be compared. Moreover, it has also been found that phonological awareness is related to the ability of phonological processing as well as metalinguistic awareness (Gillon, 2007). In this context, a measurement model concerning phonological awareness can be developed and a measurement model can be obtained which explains all aspects of this skill. In addition, the effects of moderator and mediator

variables on this measurement model can be tested by depending on the related literature. This study was planned as experimental design. However, except the experimental studies, action research can be used to define the impacts of phonological awareness training provided to preschool teachers on children's phonological skills and practices of preschool teachers.

Policy makers, institutions educating teachers, researchers, preschool teachers and families should work together to obtain the importance of phonological awareness in preschool period. In that context, policy makers can support projects aiming to make aware researchers, teachers and families on phonological awareness and to increase their skills and knowledge concerning phonological awareness. Phonological awareness training programs and activities that is appropriate for every age group in Preschool Education Program can be developed. These training programs can be integrated into primary school program. Moreover, theoretical and practical courses can be opened in the universities' undergraduate programs to develop phonological awareness of preservice preschool teachers and in these courses activity planning regarding phonological awareness can be taught. Preschool teachers can plan various activities concerning phonological skills and can incorporate in families. Also, writing center can be formed in classrooms to support phonological awareness.

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