Analysis of the Effect of Mind Mapping Activities on the Acquisition of Values of 60-72-Month-Old Children

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Abstract

The aim of this research is to analyse the effect of mind mapping activities on the acquisition of respect, responsibility, honesty, collaboration, sharing, friendship and courage values of 60-72-month-old children. The research was conducted with 30 children who received education in two separate classes of a preschool in İstanbul, Turkey. A 16-week teaching programme was carried out with the experimental and control groups using the what, where, why, when, who, how method in Turkish, drama, arts, preparation for reading and writing, music and plays and movement as integrated activities based on the teaching of values. In addition to the activities, mind mapping was carried out with the experimental group as part of the teaching of values. According to the results of the analysis, the post-test scores of the experimental group were significantly higher than those of the control group. In addition, a significant increase in the values acquired for both the experimental and control groups were determined.

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Introduction

Searches for how values education can be integrated into school curricula and how it can be applied at different educational stages continue (Berkowitz, 2011; Imam, 2020; Mei-Ju, Chen-Hsin & Pin-Chen, 2014; Sigurdardottir & Einarsdottir, 2016). Especially in early child period, well-planned educational practices are required for teaching children the values each of which is an abstract concept. In addition to integration of certain values into school curricula and programs, teachers should involve values education in in-class applications. To implement innovative activities unlike in the traditional values education, it is significant for teachers to imagine what they can do, to discover creative ways and to provide children the opportunity to do the same thing (Greishaber & McArdle, 2014).

In the literature, various studies scrutinise the effect of different educational approaches on the acquisition of values of children (Berkowitz & Bier 2005; Husu & Tirri, 2007; Richardson et. al., 2009; Skaggs & Bodenhorn, 2006). In addition to the above approaches, we believe that one of the important tools for generating, discussing and interpreting the ideas regarding values is the mind mapping technique. This is due to the fact that it offers a deeper and more permanent learning experience which helps children materialise the abstract concepts (Buzan & Buzan, 1996). In this paper, effect of the activities performed with mind mapping technique on value concept gains of children has been analysed and discussed.

Values are fundamental principles and beliefs which guide us in determining whether certain actions are good or desirable (Halstead & Taylor, 2000). Such principles are definite and systematic ideas that shape the interaction of individuals with their environment rather than their actions, chosen based on personal tastes (Veugelers & Vedder, 2003). In other words, they are the beliefs that enable the individual to protect others' rights, to accept the other individuals', and to guard the social and universal well-being while fulfilling one's own desire (Halstead & Taylor, 2000). The individual skills that are desired with the teaching of values are self-knowledge, responsibility, self-esteem, setting goals, critical thinking, communication, being productive, and reasoning (Kirschenbaum, 1995), whereas the social skills aimed for with the teaching of values are thoughtfulness, tolerance, fairness, and having values such as love, respect, goodwill, cooperation and collaboration (Acat & Aslan, 2011; Sırrı, 2015).

Values are shaped through the culture that children acquire from their families, education and social relationships (Sridhar, 2001). It is stated in the Turkish MoNE Preschool Curriculum (2013) that children need to have an idea about both universal values and the values specific to their societies. During the preschool period, it is aimed to reveal the good features that children have from birth and to equip them with good morals and to ensure their continuity (Halstead & Taylor, 2000; Ulusoy & Arslan, 2016). The opportunities provided by educators to children in this period play substantial roles in preparing them for future life (Oktay, 2007). Therefore, it is vital for preschool educators to play an active and effective role in teaching values (Uzun & Kose, 2017).

Mind maps can be used in the activities in which individuals need to produce new ideas, make plans or remember import information (Buzan, 1989). Mind maps are a way of visualisation which utilises lines, colours, numbers, pictures, symbols or key words to associate and merge a learned concept with former concepts and detail it. In mind mapping activities, the relevant subject, theme or concept is visualised centrally and the main themes of the subject spread in branches from the central image. The spreading branches contain a picture or keyword related to the central theme (Figure 1).

Figure 1. Mind mapping activity themed family events (Source:http://kiddytrack.com)

The topics related to those branches are then detailed further in more branches coming off from that one (Buzan & Buzan, 1996). In this way, the concepts and relationships regarding various information can be expressed on a page and an integrative perspective can be achieved. Mind maps assist in the detailing of concepts, knowledge or problems and the disclosure of more extensive facts about the subject (Hardy & Stadelhofer, 2006). They contribute to the development of one's attention, logic, reasoning, analysis, planning, coordination, and integration skills, as involve making arrangements by establishing relationships between information (Wen-Cheng, Chung-Chieh & Ying-Chien, 2010).

Preschool children have the capacity to present their emotions, ideas and knowledge via visual methods when appropriate developmental experiences are offered to them (Smith, Cowie & Blades, 2001). It is seen that children have the experience for generating their own mind maps when the required support and assistance are provided to them in their first attempts. In a study of Polat, Akşin and Özkarabacak (2013), it was seen that the 48-60-month-old children achieved creating mind maps which contained even the fourth-level sub-branches (Figure 2).
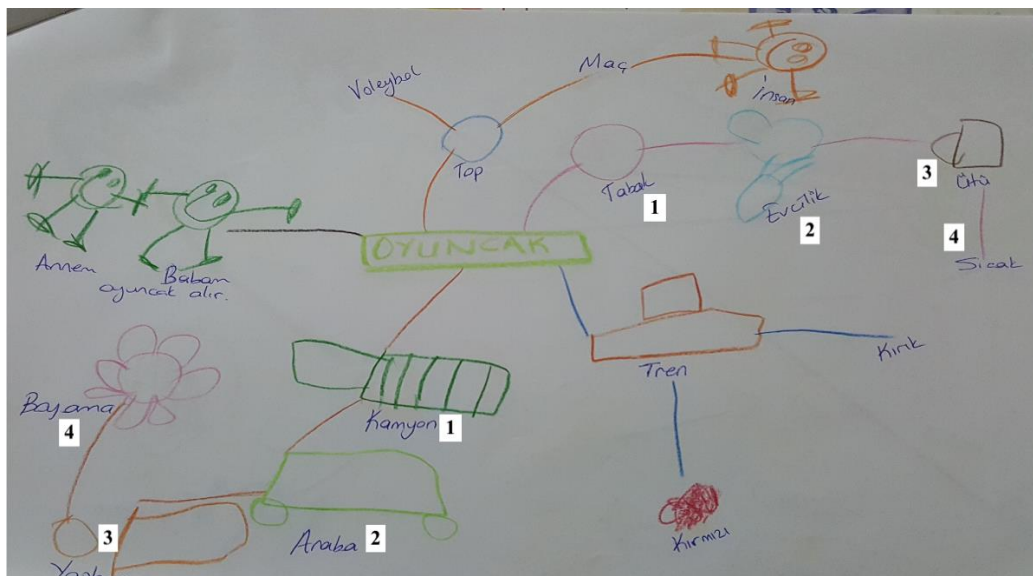

Figure 2. Mind mapping activity themed school (Adapted by permission from Polat, Akşin and Özkarabacak, 2013).

Literature contains several studies that indicate the positive effect of mind mapping activities on comprehension skills (Bilasa, 2015), and critical thinking skills (Polat & Aydın, 2020) of the 48-72-month-old children, vocabulary and listening skills of the 48-60-month-old children (Koster et al.,

2007), speaking skills of the 48-72-month-old children (van der Veen, van der Wilt & Boerma, 2018), and math and science skills of the 48-60-month-old children (Polat, Akşin Yavuz & Özkarabacak, 2017). The studies which utilise the mind mapping technique serve mainly the cognitive field. However, there are several studies that demonstrate the significant contributions of mind mapping to social-emotional field as well (Gündüz & Aktepe, 2017; Nugin, 2013; Webber, 2017).

Although several studies indicate the positive effect of mind mapping activities on various skills of young children, research that analyses the effectiveness of mind mapping on the acquisition of values for children has not been conducted, as yet. We hypothesise that mind mapping will positively affect the acquisition of values for children. In addition, there are very few mind mapping studies carried out with young children. We believe that the studies which analyse the influence of mind mapping on various skills of young children will fill the gap in the literature. Based on the above reasons, this study aims to examine the effect of mind mapping activities on the acquisition of values of 60-72-month-old children. The hypotheses to be tested in line with this goal, are as follows:

1. According to the results of the assessment carried out before the implementations, there is not any significant difference between pretest scores of the experimental and control groups in terms of value concept gains.
2. According to the results of the assessment carried out before and after the implementations, there is not any significant difference between pretest and post-test scores of the control group in terms of value concept gains.
3. According to the results of the assessment carried out before and after the implementations, there is a significant difference between pretest and post-test scores of the experimental group in terms of value concept gains.
4. According to the results of the assessment carried out after the implementations, there is a significant difference between post-test scores of the experimental and control groups in terms of value concept gains.

Method

In the study, a quantitative research method of pre-test post-test with a control group model was adopted for. The Turkish MoNE Preschool Curriculum (2013) is implemented at the educational institution which hosted the study. A 16-week teaching programme was created by the researchers in the context of teaching values and was carried out by teachers using the what, where, why, when, who, how (5W1H) method in Turkish, drama, arts, preparation for reading and writing, music, play and movement as integrated activities based on the teaching of values. 5W1H is one of the techniques used to analyse the components of a text, case or problem and the relationships between them. Individuals answer the six questions that allow for multidimensional thinking to understand the text, case or problem and produce solutions for them. In this way, this method contributes to the development of thinking and problem-solving skills (McNeill, 2004). Both experimental and control groups were subjected to this programme implemented for 16 weeks within the study. In addition to the programme, mind mapping was carried out with the experimental group as part of the teaching of values. The acquisition of values of children in the experimental and control groups were evaluated before and after the application.

Study group

The study was conducted at a private pre-school in İstanbul during the 2018-2019 academic year. Teachers of the experimental and control groups, namely their own classes were chosen randomly among the teachers who attended the study on a volunteer basis. A total of 30 children in the 60-72-month group constituted the study group. Gender distribution of both experimental and control groups was the same. Namely, seven male students and eight female students made up each group which comprised of 15 individuals. In the experimental group, 10 and five children had received preschool education for two and three years, respectively. In the control group, 11 children had had preschool education for two years while four children had been in preschool for three years.

Data Collection Tools

Preschool Values Scale Student Form: The Preschool Values Scale, consisting of family, teacher and student forms, was developed by Neslitürk and Çeliköz (2015). The forms within the scale can be assessed both independently through separate application and collectively. The scale is in Turkish and consists of six sub-dimensions which involve both national and universal values: respect, responsibility, honesty, collaboration, sharing and friendship. The student form contains a total of 18 stories and visuals for these stories. In one-to-one interviews carried out with the children, stories are told using visuals and the answers of the children are evaluated as scores zero, one and two, in line with the assessment criteria of the measurement tool. According to the binary search method of the Student Form for the Test, reliability coefficient of the tool was determined as .85. On the other hand, the reliability coefficient calculated with KR- 20 corresponded to .83.

Courage Value Observation Form: Developed by Yıldırım (2018), this comprised of 19 items which aimed to determine the levels of acquisition of the courage value among the children aged four to six. The form, which is answered based on the teacher's observations of the children is in the form of a five Likert scale, where five is 'always' and one is 'never'. The form comprises of a single factor. The form is assessed on the total scores of children for each item.

Data Collection Process

The themes of values education that form the centre of mind mapping studies were identified after the application of pre-tests of the research. At this stage, interviews were carried out with the participating teachers and school management to determine the themes of values education in the current curriculum. In this regard, the following 15 themes were included: kindness, honesty, generosity, sharing, love, courage, respect, tolerance, trust, responsibility, patience, collaboration, peace, freedom and differences. In the pre-tests, the Courage Value Observation Form was filled out based on the observations of children by teachers and the Preschool Values Scale Student Form were applied to children directly by one of the researchers.

Implementation of 5WHK Based Values Education Programme and Mind Mapping Practices

Prior to practices, mind mapping training was provided to all voluntary teachers in the institution which was subjected to the research. The four-day-training was performed at the same school after the work hours of teachers. As part of the training, what mind mapping is, how it is applied and how it is taught to children were explained to teachers practically. This was followed by the implementation of the pre-tests. Later, practices were carried out with children on February 4, continuing for 16 weeks until May 24. Mind mapping studies were carried out by the experimental group as large group activities in accordance with the determined themes for the first four weeks. During the next 11 weeks, children carried out individual mind mapping in line with the theme addressed. In week 16, a large group mind mapping study was carried out with children based on the general "values" theme in order to ensure the further comprehension of the former 15 themes. Thus, the children in the experimental group created 16 mind maps about 15 identified themes over 16 weeks. The themes are discussed among researchers and teachers in accordance with the semester curriculum formed by the teachers in order of kindness, honesty, generosity, sharing, love, courage, respect, tolerance, trust, responsibility, patience, collaboration, peace, freedom and differences.

In the large group mind mapping activities, a large background was formed by combining four, six or eight sheets of large craft papers. The theme of the mind map was written in the middle and guidelines that assist children in learning mind mapping were drawn to generate main branches and keywords were written there. During the activities, the whole class lay down in a comfortable environment accompanied by music. It was found suitable that mind maps would be made on the floor of the classroom to provide a comfy study environment for the children. The class teacher would tell the children the keyword on each main branch of the mind map. The teacher would then encourage the children to express their thoughts on paper by drawing pictures on the main branches with crayons and continue to write down the meaning of children's drawings. In addition, the teacher provided the children with guidance and support in establishing relationship networks by linking the pictures drawn by them to the main theme.

Each of the 15 themes determined was addressed for one week during the intervention. Various activities were performed on the first four days of the week based on the weekly theme. Such

activities aimed to equip the children with the knowledge and skills for carrying out mind mapping on the relevant theme. For both the experimental and control groups, the what, where, why, when, who, how method was used in Turkish, drama, arts, preparation for reading and writing, music, plays and movement as integrated activities based on the teaching of values. For each theme, a design, a book, and a poster creation activity was carried out with the children. On the fifth day of the week, a conversation about the weekly theme was carried out with children. Following this, the mind mapping activity was carried out. For example, in the week themed respect, children were asked to bring photos of themselves and family elders taken at different times, and a discussion was conducted on the changes in the people in the photos. Then, how we should behave towards our elders, what we can learn from them, how we should behave towards them for traditional festivals, how we can help them and why and how we should share time were discussed and related dramas were performed. Children were asked to imagine and draw how they would be when they became elderly. In another activity, a conversation on what respect represents, why respect to the elders is important and about which subjects we should show our friends respect was carried out. Elders were invited to school, where they sang songs and were asked to tell the children tales. After this, they played games from their childhood and danced to traditional music. They then talked about who they learned these plays/tales/songs from, when they used to play them and the type of childhood they had.

As a design activity, linked with respecting our environment, the children were asked to invent a machine to prevent too much noise. They were told to first imagine it with their eyes closed first, then to draw their dream machine and finally to create the machine by using scrap materials. During this process, the teacher only gave guidance and provided sufficient support to them, upon their help request. Additionally, the children were asked to fold an A4 paper in the form of an accordion to create a book titled "My Tiny Respect/Love/Peace, etc. Book". They depicted the information they learned on each page and showed their books to each other. As a large group, the children prepared a poster themed Respect on a large craft paper. All the above practices were carried out with both the experimental and the control groups. However, unlike the control group, the children in the experimental group generated a mind map themed 'respect' on day five. The activities for the other themes were prepared and implemented in this way.

The last week aimed to reveal the knowledge regarding values learned by the children in the previous 15 weeks. Following the formation of mind maps on all themes, the whole class combined eight pieces of craft paper and made a large group mind map themed "Values" (Figure 3).

Figure 3. Mind mapping activity themed teaching of values

In post-test carried out to scrutinise the acquisition of values for children, the Courage Value Observation Form was filled out based on the observations of the children by their teachers. On the other hand, the Preschool Values Scale Student Form was applied to children directly, by one of the researchers. All applications performed during the research process are given in Table 1.

Table 1. Information about the applications performed in the research

Application	Group	Duration
Mind Mapping Training	Teachers	4 days
Pre-test	Experimental and Control Groups	2 days
5W1H-Based Activities	Experimental and Control Groups	16 weeks (The first four days of every week)
Mind Mapping Activities	Experimental Group	16 weeks (The fifth day of every week) Week 1 to Week 4: Large Group Week 5 to Week 15: Individual Week 16: Large Group
Post-tests	Experimental and Control Groups	2 days

Ethics

Prior to this study, the necessary legal permissions were initially obtained from the Provincial Directorate of National Education, and the research who developed the scales utilised in data collection process. The institution to be take part in the study was determined. Later, teachers of the experimental and control groups, namely their own classes, were chosen randomly among the teachers who attended the research on a volunteer basis. A meeting was held with parents of the children in both classes chosen. In the meeting, the parents were informed about the research process as well as that the information obtained from children would be used for only scientific purpose and confidentiality of the information would be maintained. Written consent was obtained from the parents who voluntarily accepted the participation of their children in the research. Later, researchers performed an acquaintance activity with children and introduced the study in plain language. Pre-tests and post-tests were applied to each child individually in a silent and quiet room within the institution. After the post-test phase, the control group was subjected to daily mind mapping practices for the remaining three weeks of the academic term in order to ensure equality in opportunity.

Data analysis

Data sets were generated through the use of coding in the analysis of the research data, using a SPSS package programme. First, descriptive analyses of the experimental group and the control group were carried out. Later, the descriptive values of pre-test and post-test scores of both groups were examined and normality assumptions were met. Parametric comparison techniques were utilised in the following analyses of the research. Based on the first hypothesis of the research, means were compared via independent sample t-tests for the purpose of testing the significance of difference between pre-test scores of the groups. According to the second and third hypotheses, a paired samples t-test was applied to determine whether or not there was any significant difference between the total mean scores of the pre-test and post-test of the groups. For the fourth hypothesis of the study, means were compared through independent samples t-test to determine whether or not there was any significant difference between post-test mean scores of the groups.

Limitations

This study was conducted with 30 children who were receiving education in a private preschool. In the study, one class from the relevant preschool was assigned as the experimental (n=15) group and another class as the control group (n=15). According to data from the Turkish Statistical Institute (2020), the average number of children per classroom within preschools corresponds to 19.24 for the 2018-2019 academic year. This fact results in a limitation in the number of participants in the experimental studies which contain groups appointed based on class and may have a negative impact on the reliability of the analyses conducted. For this reason, the number of participants was accepted as a limitation of the research.

Practices of the study were performed by the teachers of the experimental and control groups. Researchers attended some of the activities as observer. In this process, it was seen that teachers exhibited similar approaches. Therefore, the variability originating from teachers was assumed to be minimum. The Courage Value Observation Form used in the study was implemented by the teacher based on their observations. In contrast, the Preschool Values Scale Student Form was filled in based on the one-to-one application with the children, by one of the researchers. Therefore, an intercoder reliability check could not be performed for this study.

Findings

In this study, which analysed the effect of mind mapping activities on the acquisition of values for 60-72 month-old children, the significant difference between Preschool Values Scale Student Form and Courage Value Observation Form pre-test scores of the experimental and control groups, the significant difference between the pre-test and post-test scores of the experimental group, the significant difference between the pre-test and post-test scores of the control group and the significant difference between the post-test scores of the experimental and control groups were examined. Difference tests were applied with the aim of assessing the acquisition of values of the children who studied with mind maps and those who were not involved in mind maps.

Descriptive values of 30 children with respect to age variables are given in Table 2.

Table 2. Descriptive values for age

Group	n	Min	Max	$\bar{x}$	$sh_{\bar{x}}$	sd	γ_1	β_2
Experimental	15	67.00	72.00	70.53	.44	1.72	-1.17	.50
Control	15	66.00	71.00	69.00	.46	1.81	-.49	-1.10

As seen in Table 2, the following data were obtained for the age variable of the *experimental* group: arithmetic mean $\bar{x}$=70.53, standard error $sh_{\bar{x}}$=.44, standard deviation sd=1.72, the minimum value attained min=67 months, the maximum value max=72 months, skewness value γ_1=-1.17 and kurtosis value β_2=.50; the data for the age variable of the *control* group are as follows: arithmetic mean $\bar{x}$=69.00, standard error $sh_{\bar{x}}$=.46, standard deviation sd=1.81, the minimum value attained min=66 months, the maximum value max=71 months, skewness value γ_1=-.49 and kurtosis value β_2=-1.10.

It was decided to assess the normality of distribution obtained from the total pre-test and post-test scores of the experimental and control groups, with a proper hypothesis test. For this purpose, the Shapiro Wilk's analysis was conducted to test whether the distribution formed with the Preschool Values Scale Student Form (PVSSF) and the Courage Value Observation Form (CVOF) pre-test and post-test scores is different from the normal distribution. The use of the Shapiro-Wilk's analysis (Shapiro & Wilk, 1965) is recommended for checking the normality hypotheses if the study is performed with small sample groups (n≤35). Shapiro-Wilk's analysis performed is provided in Table 3.

Table 3. Shapiro Wilk's analysis for total pre-test and post-test scores

Group	Scores	n	γ_1	β_2	SW	sd	p
Experimental	PVSSF_PRE	15	-.296	-1,045	.95	15	.602
	PVSSF_POST	15	-.05	-1.35	.92	15	.192
	CVOF_PRE	15	.33	-1.09	.93	15	.338
	CVOF_POST	15	-.78	-.37	.91	15	.173
Control	PVSSF_PRE	15	-.32	-.81	.97	15	.905
	PVSSF_POST	15	.77	-.01	.92	15	.265
	CVOF_PRE	15	.89	-1.21	.95	15	.571
	CVOF_POST	15	.38	.51	.96	15	.771

As a result of the Shapiro-Wilk's analyses, it was discovered that the difference between the distributions for PVSSF total pre-test scores (*SW=.95; p>.05*), PVSSF total post-test scores (*SW=.92; p>.05*), CVOF total pre-test scores (*SW=.93; p>.05*) and the CVOF total post-test scores (*SW=.91; p>.05*) of the experimental group, and the theoretical normal distribution is not significant. Similarly,

it was determined that the difference between the distributions for the Preschool Values Scale Student Form total pre-test scores (*SW=.97; p>.05*), the PVSSF total post-test scores (*SW=.92; p>.05*), the CVOF total pre-test scores (*SW=.95; p>.05*) and the CVOF total post-test scores (*SW=.96; p>.05*) of the control group, and the theoretical normal distribution is not significant. Therefore, parametric comparison techniques were utilised in the following analyses of the study.

First, means were compared through independent sample t-test to identify whether there was any significant difference between the PVSSF and the CVOF total mean pre-test scores of the experimental and control groups.

A comparison between the mean pre-test scores of the experimental and control groups based on the first hypothesis of the study is shown in Table 4.

Table 4. Comparison of pre-test between the experimental and control groups

Score	Group	N	$\overline{\text{x}}$	*ss*	$Sh_{\overline{\text{x}}}$	t	Sd	p
						t Test		
PVSSF_PRE	Experimental	15	13.13	4.01	1.03	.22	28	.827
	Control	15	12.80	4.26	1.10			
CVOF_PRE	Experimental	15	41.66	3.71	.95	-.19	28	.846
	Control	15	41.93	3.73	.96			

As is seen in Table 4, it was revealed after the independent samples t-test carried out to determine whether there was any significant difference between the PVSSF (*t=.22; p>.05*) and the CVOF (*t=-.19; p>.05*) pre-test scores for the experimental and control groups, that there was no significant difference between the arithmetic means of the groups.

Based on the second and third hypotheses of the research, means were compared via paired samples t-test to clarify whether there was any significant difference between the PVSSF and the CVOF total mean pre-test and post-test scores of the experimental and control groups. Table 5 contains the results of paired samples t-test.

Table 5. Comparison of pre-test and post-test between the experimental and control groups

Group	Groups	N	$\overline{\text{x}}$	*ss*	$Sh_{\overline{\text{x}}}$	t	Sd	p
Experimental	PVSSF_PRE	15	13.13	4.01	1.03	-8.22	14	.000
	PVSSF_POST	15	18.26	5.17	1.33			
	CVOF_PRE	15	41.66	3.71	.95	-55.14	14	.000
	CVOF_POST	15	90.00	3.04	.78			
Control	PVSSF_PRE	15	12.80	4.26	1.10	-3.52	14	.003
	PVSSF_POST	15	14.00	3.62	.93			
	CVOF_PRE	15	41.93	3.73	.96	-8.42	14	.000
	CVOF_POST	15	49.46	4.74	1.22			

In Table 5, the difference the between PVSSF total mean pre-test and post-test scores of the experimental and control groups was found to be significant both for the experimental group (*t=-8.22; p<.05*) and control group (*t=-3.52; p<.05*). Similarly, the difference between the CVOF total mean pre-test and post-test scores was found to be significant both for the experimental group (*t=-55.14; p<.05*) and control group (*t=-8.42; p<.05*). For both groups, post-test means are significantly higher than pre-test means. It can be said, based on t values of the groups for both tests, that the effect of the independent variable in the experimental group was higher than the effect of the possible variable which influence the control group.

Lastly, for the fourth hypotheses, means were compared via independent samples t-test to reveal whether there was any significant difference between the PVSSF and the CVOF, total mean post-test scores of the experimental and control groups. Results of the independent samples t-test are given in Table 6.

Table 6. Comparison of the post-test between the experimental and control groups

Score	Groups	N	$\overline{x}$	ss	$Sh_{\overline{x}}$	t	Sd	p
							t Test	
PVSSF_POST	Experimental	15	18.26	5.17	1.33	2.61	28	.014
	Control	15	14.00	3.62	.93			
CVOF_POST	Experimental	15	90.00	3.04	.78	27.82	28	.000
	Control	15	49.46	4.74	1.22			

As is seen in Table 6, a significant difference between the PVSSF ($t=2.61$; $p<.05$) and the CVOF ($t=27.82$; $p<.05$) total mean post-test scores were found as a consequence of the independent samples t-test carried out to determine whether there was any significant difference between the total mean post-test scores of the experimental and control groups. Following the application of the independent variable, the findings demonstrate that arithmetic means of the experimental group is significantly higher than those of the control group.

Discussion, Conclusion and Suggestions

In line with the results of this study, which analysed the effect of mind mapping activities on the acquisition of values for 60-72-month-old children, it was determined that value gains of both the experimental group who were subjected to mind mapping studies, as well as 5W1H-based values education programme, and those of the control group who received only 5W1H-based values education programme increased significantly. In addition, the post-test scores of the experimental group were significantly higher than those of the control group.

The importance of the experiences of a child, the environment in which they live, their social interactions and active participation play an important part in the development of values in early childhood. (Hujala, 2001; Lickona, Schaps & Lewis , 2007). Mind mapping activities are a suitable method for developing the active participation and thinking and negotiation skills of children (Buzan & Buzan, 1996). Particularly in the first phase of mind mapping, social communication is encouraged when children generate and share ideas about the related theme. During this phase, the whole group is included in the discussion and in solving a common problem. The mind mapping technique utilised in the study ensured that the children were able to display a high level of social interaction and active participation in the activities regarding values. In addition, the experimental group who participated in the mind mapping activities found the chance to embody abstract concepts such as values. It was concluded that above-mentioned advantages of the mind mapping technique form an influential strategy in the gaining of the values of respect, responsibility, honesty, collaboration, sharing, friendship, and courage in children.

Value fact is a behavioural choice for people and is gained in the early periods of human life (Sridhar, 2001). Societies desire teach children the values such as showing respect for elders and peers, a love of humanity and nature and tolerance towards different cultures and thoughts are the types of values that society wishes to convey to children. (Canatan, 2008). Children create a social identity in time and internalise the culture which surrounds them, through the values they have gained and through their social interactions (Berger & Luckman, 1999; Bradshaw et al., 2001). The importance of early childhood on the gaining of value for children means that the ways in which to teach values to young children is a subject worthy of discussion. Various research that analyses the effect of different educational approaches on value gain in early childhood can be found in the literature (Crowther, 1995; Gökçek, 2007; Halat, 2007; Ulavere & Tammik, 2017). However, there is no research that scrutinises the effect of mind mapping on value gains of children. In this regard, it can be said that the results of this study make contribution to the literature.

Mind mapping is an important technique that allows children to depict their knowledge about a given theme/concept/object, etc. and associate the ideas with each other, thereby ensuring permanence of knowledge in their minds. Thanks to mind mapping, children understand a theme/concept/object, etc. more easily and in an integrative way, consolidate their knowledge and recall the knowledge more quickly when they need. In the literature, there are studies which analyse the effect of mind mapping on various skills of pre-schoolers. In a study by Bilasa (2015), it was

discovered that the mind mapping activities performed with children aged 4-6 years, promote their learning skills. Daghistan (2016) showed, in an experimental study, that mind mapping activities lead to a positive influence on attention levels of pre-schoolers. Koster et al. (2017) showed the effect of mind mapping studies on reading comprehension and vocabulary of the children aged 4-6. In another study, Polat, Yavuz ve Tunç (2017) found that mind mapping activities generated a significant and positive difference in mathematical and science skills of pre-schoolers. Van der Veen, van der Wilt and Boerma (2018) revealed the positive influence of applying mind mapping in interactive reading activities on vocabulary and listening skills of young children. The current research discovers that the mind mapping technique is an influential strategy for values education as well as bringing children in these skills in the literature.

Basic characteristics of the Turkish MoNE (2013, p.17) Preschool Curriculum have the following: "The curriculum... encourages students to respect differences and to have experiences about living with individuals in harmony." Nevertheless, a separate title for the teaching of values was not included in the curriculum. The teaching of values was highlighted in the curriculum in an integrative way as part of the gains and indicators. Aral and Kadan (2013) analysed the gains and indicators of the curriculum in the terms of the teaching of values. It was indicated in the study that values of responsibility, respect, solidarity, trust, love, tolerance, freedom, equality, justice and friendship are included in the preschool curriculum. However, the most emphasised value of the curriculum is responsibility followed by the values of respect, solidarity, trust, love, tolerance, freedom, equality, friendship and justice. Therefore, it can be said that the curriculum has a content which supports the acquisition of values of children. This fact promotes the results of the study. In other words, both support of the MoNE (2013) Preschool Curriculum in the acquisition of values of the children, and the values education activities which were prepared and applied by researchers led to a positive increase in value gains of the control group.

The use of mind maps during the preschool period is an influential strategy for allowing children to develop new ideas, learn in an integrative way, consolidate the knowledge learned, establish relationships between the existing knowledge, make knowledge permanent and recall quicker. For this reason, it can be said that mind mapping studies help the preschool curriculum promote and enrich. The Turkish MoNE (2013) Preschool Curriculum's flexible and eclectic structure enables the gains of the curriculum to be brought together differently and allows for the use of various materials and integration of distinct approaches. Children use both their memory skills and imagination simultaneously during mind mapping. It is thought that the effect of the regular performance of mind mapping activities in preschool period is quite substantial due to making positive contributions to development of children.

One of the two measurement tools used in this study was filled in by the relevant class teachers while the other was filled in by one of the researchers. The Courage Value Observation Form filled in by teachers is based on their observations of the child and was developed to be directly applied by their own teachers. For this reason, it is not possible to be carried out by another coder nor is it possible to evaluate the agreement between coders. As specified in the section on the limitations of the study, the Preschool Values Scale Student Form was implemented by only one researcher. As such it should be taken into consideration that this is a limitation in terms of the reliability of the results of the study which encompassed the value gains of respect, responsibility, honesty, collaboration, sharing and friendship in children.

We believe that it is important to give pre-school teachers the necessary training on the mind mapping technique in order to popularise mind mapping in the educational environment starting from the preschool period. In addition, literature contains very few mind mapping studies conducted with young children, so we feel that there is not enough knowledge about the mind mapping skills of this age group. Hence, we believe that the analysis of the effect of mind mapping on development of different skills in preschool period will be useful.

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