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Editorial

Dear IEJEE Readers,

We are proud of presenting Volume 11, issue 4 of International Electronic Journal of Elementary Education (IEJEE) for our readers. As the Editor-in-Chief of IEJEE, I always look for reading the submitted papers and the accepted version of the papers before publication.

I am always amazed by the informative tittles, but this time I decided to take a look at the key words mentioned in all the fourteen papers. I would like to share the key words with you:

Reading Fluency, Learning Problems, Single-Case Study, Reading Racetracks, Primary School, Social Studies, Spatial Perception Ability, Google Earth, Mixed Method, Vocabulary Acquisition, Vocabulary Instruction, Pleasure Reading, Efficiency, Intercultural Education, Ethnocentrism, Teacher Training, Visual Arts Education, Elementary School, Special Education, Opportunities to Respond, Positive Reinforcement, Professional Development, In-Service Training, Reflective Thinking, Action Research, Mentally Handicapped Children, Fatherhood, Psychological Resilience, Multiple-Choice, Classical Written, Open-Ended Questions, Metaphor, Environmental Knowledge, Environmental behavior, Middle School, Active Learning, Local Environment, Conceptual Change, Misconception, Pedagogical Puppetry, Educational Methods, Secondary Education, Literature Review, Values, Respect, Respecting Differences, Morality, Interculturality, Empathy, Reading Comprehension, Sentence Verification Technique, Meaning Identification Technique, Cloze Test, Social learning, Visual Culture and Observational Learning,

These keywords are not only informative, but also they represent important topics in education. They are among the contemporary educational issues that worth to address from different approaches in different social environments.

I hope you will find at least one of the papers relevant for your interest and/or field of research.

As always I would like to express my thanks to Dr. Hayriye Gül Kuruyer, Dr. Gökhan Özsoy and Dr. Turan Temur for their editorial management and coordination of review process. I also would like to thank to Abdullah Kaldırım, IEJEE's technical staff and all the peer-reviewers. And last, but not least, I want to express my deep gratitude for the researchers that preferred IEJEE for their research publications.

Prof. Dr. Kamil Özerk, University of Oslo, currently visiting researcher at Chapman University, USA.
IEJEE, Editor-In-Chief

Editor-In-Chief

Prof. Dr. Kamil Özerk,
Editor-In-Chief, IEJEE

All responsibility for statements made or opinions expressed in articles lies with the author.

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The Effects of Reading Racetracks on the Sight Word Recognition of Four Elementary School Students with Learning Difficulties

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Abstract

Many children with different kinds of learning problems struggle with reading. To help them combat their challenges, easy-to-implement interventions are needed. Reading racetracks have proven to be effective tools to increase sight word fluency in students with disabilities. The purpose of this single-case study was to evaluate this technique, for the first time, in a context outside of the United States. Four elementary school children with various learning difficulties received nine to twelve individual intervention sessions from one of two graduate students. The results indicated that reading fluency of 30 common two-syllable German words rose remarkably in all four participants. Even though the treatment was a little less effective for one female student, diagnosed with intellectual/developmental delays, than for the other three students, performance gains were still noteworthy. This study provides further evidence that reading racetracks are an effective practice to build fluency in children with disabilities.

Keywords: Reading Fluency, Learning Problems, Single-Case Study, Reading Racetracks

Introduction

Reading is certainly one of the most important skills a child must acquire during the early years of schooling. It provides the groundwork for a productive life. Research indicates that students who read well have a high probability of achieving success in school and later, in the work force (Aaron, Joshi, & Quatroche, 2008; Slavin, Madden, Dolan, Wasik, Ross, & Smith, 1994). By contrast, those who fail to acquire adequate reading skills face an increased likelihood of dropping out (Hernandez, 2011), unemployment (National Research Council and National Academy of Education, 2011), and overall low income (Snyder, de Brey, & Dillow, 2016).

The ultimate goal of reading is to construct meaning from written content. According to the theory of automatic word processing (LaBerge & Samuels, 1974; Logan, 1988), word recognition automaticity is indispensable for reading fluency, which in turn is a key foundation for text comprehension (Miller & Schwanenflugel, 2006; Paige, 2011). If individuals must invest too much of their cognitive resources in executing their phonological skills and consequently demonstrate slowed oral language processing speed, their opportunities to focus on meaning are highly limited (Ardoin, Morena, Binder, & Foster, 2013; Swain, Leader-Janssen, & Conley, 2013). Thus, to be able to extract meaning from print, one must first acquire the skill of decoding words quickly, accurately, and effortlessly (Lee & Yoon, 2017).

Unfortunately, a great many students do not exhibit adequate phonological competency and sufficient language processing speed. In Germany, where this study took place, 12.5% of children and adolescents do not even meet the minimum standard for reading in terms of grade-level (Stanat, Schipolowski, Rojsk, Weieich, & Haag, 2017). If such problems are not remedied during the first two to three years of elementary education, they usually remain until adulthood (Zentall, 2014). Hence, it is absolutely crucial to offer children who face reading difficulties well-grounded interventions that facilitate their acquisition of adequate fluency skills. This will reduce the cognitive overload that usually impedes their ability to understand a textual message (Vaughn & Bos, 2018).

Among the most common interventions aimed at fostering reading fluency are repeated reading, passage preview, systematic error correction, tutoring, and peer-reading activities (Fuchs & Fuchs, 2005; Lee & Yoon, 2015). All of these approaches are characterized by intense iteration. They include many common elements of effective teaching procedures: modeling, multiple exposures to vocabulary, repeated practice with active student responding, and frequent feedback. According to the comprehensive meta-analysis by Suggate (2016), approaches that focus on children's ability to read accurately and at an appropriate rate yield a medium average effect size (d= 0.47).

When trying to compel students to actively participate in treatments that are easily perceived as monotonous and dull, motivating them to learn presents a great challenge. One promising way to successfully overcome this hurdle is to incorporate a playful dimension into the concept of the training exercise. According to Lämsä, Hämäläinen, Aro, Koskimaa, and Ayram (2018), educational games have the potential to lift the drudgery of drilling the students and can inject an element of fun into otherwise tedious training sessions.

Among the most commonly used alternatives are so-called racetracks (Rinaldi & McLaughlin, 1996; Rinaldi, Sells, & McLaughlin, 1997). A racetrack is a game board, designed to look like a Formula 1 circuit, with a predetermined number of blank cells (see Figure 1). It has mostly been used to teach children math facts (e. g. Lund, McLaughlin, & Neyman, 2012; Skarr, Zielinski, Ruwe, Sharp, Williams, & McLaughlin, 2014), read sight words (e. g. Crowley, McLaughlin, & Kahn, 2013; Davenport, Konrad, & Alber-Morgan, 2018), or spell vocabulary (e. g. Arkoosh, Weber, & McLaughlin, 2009; Verdiun, McLaughlin, & Derby, 2012).

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Table 1. *Study Descriptives for Nine Single-Case Analyses on the Effects of Reading Racetracks*

Authors/years	Design	N	Age	Disability	PND
Alexander, McLaughlin, & Derby (2008)	MBD	4	8-9	MR, FAE, ASD, LD	98.33%
Crowley, McLaughlin, & Kahn (2013)	MBD	2	7	ASD	98.89%
Erbey, McLaughlin, Derby, & Everson (2011)	MBRD	3	7-11	LD, ADHD	83.04%
Green, McLaughlin, Derby, & Lee (2010)	MBRD	2	12	BD, LD, PI	91.67%
Hopewell, McLaughlin & Derby (2011)	MBD	2	7-8	BD	76.67%
Hyde, McLauglin, & Everson (2009)	Reversal	2	5th and 6th grade	LD, MR	100%
Kaufman, McLaughlin, Derby, & Waco (2011)	MBD & Reversal	3	7-9	ADHD, LD	69.45%
Mc Grath, McLaughlin, & Derby (2012)	Reversal	3	7-8	LD; OHI	81.11%
Rinaldi, Sells, & McLaughlin (1997)	MBD	10	8-11	LD, MR, ADHD, FAE, OHI	98.77%

Note. MBD= multiple baseline design; MBRD= multiple baseline reversal design; Reversal= reversal design, PND= percentage of non-overlapping data; MR= mental retardation; FAE= fetal alcohol effects; ASD= autism spectrum disorder; LD= learning disability; ADHD= attention deficit hyperactivity disorder; BD= behavioral disorders; P= orthopedically impaired with severe scoliosis; OHI= Other health impairment

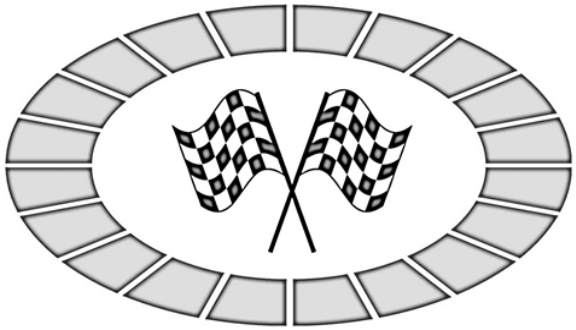

Figure 1. An example of a reading racetrack playing field

When playing a racetrack game with students, a teacher or tutor creates lists with math facts or words, writes them on cards, turns them upside down, and puts one on each cell. The specific math facts or words chosen depend on the individual needs of a particular learner. To play the game, a student rolls a die and moves a matchbox racecar forward, in accordance with the number of eyes on the die (it is irrelevant from which field the students start). When the piece stops on a certain card, the teacher or tutor turns it over. In the case of a reading racetrack, the learner is presented with a word and asked to read it. If she or he struggles, scaffolded assistance and corrective feedback are provided. Subsequently, the card is replaced on the field, front side down, and the game continues (Davenport, Konrad, & Alber-Morgan, 2018; Hopewell, McLaughlin, & Derby, 2011).

A computer-based search in the databases Academic Search Complete, E-Journals, ERIC, PsycINFO, Scopus, and TOC Premier for academic papers containing the words "reading racetracks" in their titles resulted in nine hits. The studies were published between 1997 and 2013 and are listed in Table 1.

All of these publications describe single-case experiments with children with special needs, mostly with learning disabled students. The effects of the intervention are in the medium to large effects size range (with PNDs varying between 69.45 and 100%), which squares with the findings of the aforementioned meta-analysis by Suggate (2016). Although the body of existing publications already seems to provide a solid basis for the consideration of reading racetracks as a well-proven and tested technique for fostering reading fluency among at-risk children, the current state of the art does not meet the necessary requirements. All studies in Table 1 stem from research conducted by Tim F. McLaughlin and his team at Gonzaga University. The Council of Exceptional Children's widely accepted standards, regarding the potential contributions of single-subject analyses to establishing a treatment as evidence-based, stipulate: "… the studies are conducted by at least three different researchers across at least three different geographical locations" (Horner, Carr, Halle, McGee, Odom, & Wolery, 2005, p. 176). Thus, the purpose of this study was to evaluate the effects of a reading racetrack game on the word recognition automaticity of four elementary students with learning problems in an environment different from the one in which previous experiments have been conducted.

Method

Participants and Setting

Four elementary school students participated in this investigation: Amelie, Bianca, Collin, and Dario (all names changed for anonymity). They all attended an inclusive grade school in a little district town in the western part of Germany. None of them had an immigrant background and all four students grew up with German as their mother tongue. To be eligible for the study, the children had to score in the bottom 5% of a standardized reading assessment instrument, the Salzburg Reading and Writing Test (SLRT-II; Moll & Landerl, 2014). Three teachers referred 20 students from grades 2, 3, and 4 to me, because they had the impression that all of them struggled heavily with reading. I conducted the SLRT-II to assess these children and identified the abovementioned learners who – according to the test – were unable to fluently read pseudo and real words alike. Their rank never exceeded the 3rd percentile. All four students recognized every letter of the alphabet and were able to blend them together. However, they did not know many sight words and read extremely slowly.

Amelie was 9 years old and attending fourth grade at the time of the experiment. About two years ago, she was diagnosed with intellectual/developmental delays. According to her main teacher, Amelie became frustrated very easily; it was difficult to motivate her. Bianca was 7 years old and attending second grade when she participated in this study. She was diagnosed with a learning disability and demonstrated signs of a language delay. Bianca had an especially hard time comprehending language. In addition, she had psychomotor problems. According to her main teacher, Bianca enjoyed going to school, despite these challenges. Meeting her friends there was very important to her. Collin was also 7 years old and Bianca's classmate. He was diagnosed with a learning disability, but also exhibited signs of oppositional defiant disorder; he had obvious difficulties with reading, as well as with writing. Dario was also 7 years of age and attending second grade at the time of the experiment (though he was in a

different class than Bianca and Collin). He had a learning disability and a speech disorder, particularly evident in the areas of phonology, semantics, and language comprehension. According to his main teacher, Dario's motivation to participate in classroom activities varied very much and he had serious difficulty concentrating.

Materials

Two graduate students created a DIN-A-3 racetrack field that looked similar to the one depicted in Figure 1 and consisted of 30 cells. For each cell, one card was prepared, with one word printed on it. The words were the 30 most commonly used two-syllable words in the German language, taken from a list published by the University of Leipzig (https://wortschatz.uni-leipzig.de/de). In addition, a stop watch and a die were provided. Last, a line diagram was prepared to plot the progress of the participants.

Design and Measures

I applied a multiple baseline design (AB) to evaluate the effectiveness of the intervention The experiment spanned three weeks with five daily measurements per school week. I staggered the starting points of the treatment with baseline probes varying between three and six. The allocation of the participants, to the different constellations, happened by chance to enhance the internal validity of the study. Automaticity is normally associated with and measured by a reader's speed or rate of reading (Paige, Rasinski, Magpuri-Lavell, & Smith, 2014). At the end of each baseline or treatment session, one of the previously mentioned graduate students took the cards from the racetrack game, shuffled them, and presented the participants with one word at a time. If she or he was able to read it, the next card was shown. In case a child made a mistake, she or he was quickly corrected and asked to repeat the word. After 1 minute, one of the university student thanked the participant and escorted her or him back to the classroom.

Procedures

Each of the two college students took one participant out of the classroom during the second period of each day to take her or him to a large resource room of the school, which was equipped with plenty of seats and tables, as well as with a great variety of training programs and learning materials. The college students seated the children as far apart as possible and always tried to keep their voices down to avoid distracting the second participant or any other child working in the room. After 20 minutes, Amelie, Bianca, Collin, and Dario were escorted back to their classrooms. Subsequently, the college students retrieved the other two children, who had stayed with their teachers until that point. Which of the four participants went first and which ones went second, on a given day, varied constantly.

Under baseline conditions, Amelie, Bianca, Collin, and Dario worked on simple math problems for 15 minutes. Afterward, performance probes were administered. During training sessions, the participants were presented with the line diagram showing them how well they had done on previous days. Subsequently, the racetrack game was played. The children rolled the die and moved the matchbox racecar to the respective field. Then, one of the college students picked up the card that the car landed on, turned it over, and asked the participants to read it out loud. In case they made a mistake, they were corrected, and urged to read the word again. As in the case of a baseline session, the lesson ended with a measurement of the children's performance.

Treatment Fidelity and Social Validity

I conducted three 45-minute training sessions to teach the two college students how to effectively deliver the intervention. In addition, I provided them with a 12-item checklist that included all the features that had to be observed while the treatment was undertaken (the list can be obtained from me upon request). During the experiment, the college students stayed in daily contact with me via email to ensure that the study was being conducted as intended. To enhance the social validity of the experiment, I requested the opinions of Amelie, Bianca, Collin, and Dario on the racetrack game, using a feedback sheet depicted in Figure 2. I read the questions to the students and took notes on their answers.

	Yes	A little bit	No
Did you like playing the racetrack game?			
Did the game help you to better read the words on the cards?			
Do you think you can now read better in general?			
Do you like reading now more than before?			
Did you like getting feedback on how well you did?			
Would you like to continue playing the racetrack game?			
Would you recommend the racetrack to other kids?			
Is there anything else you would like to tell me?			

Figure 2. A social validity feedback sheet

Results

All calculations were done using the MultiSCED web application developed by Cools, Declercq, Beretvas, Moeyaert, Ferron, and Van den Noorgate (2018). Figure 3 illustrates the results for the number of words read correctly, within a minute, for each student.

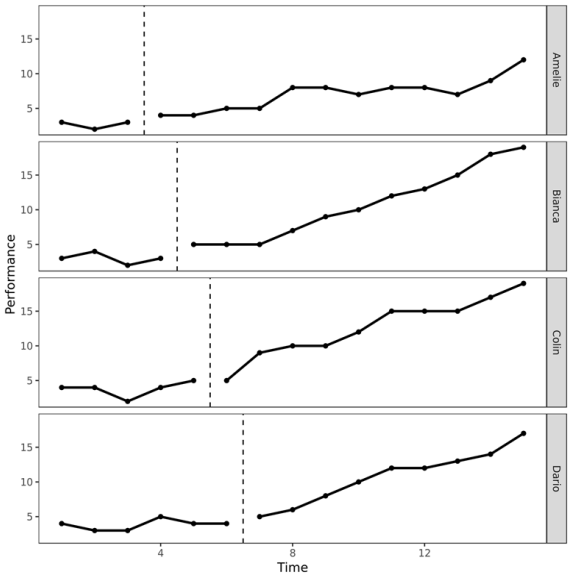

Figure 3. The effects of reading racetracks on the reading fluency of the four participants

Table 2 presents the raw scores of descriptive data across conditions.

All participants demonstrated only very moderate trends under baseline conditions. Their absolute values never exceeded 0.20. Further, the baselines showed rather low variability coefficients (*SD/M* x 100) of 21.72, 27.33, 28.95, and 19.58. At the onset of the intervention, every student improved slowly, but continuously, over time. With one exception (Amelie's seventh intervention probe), no later score fell below a previous one. Although the increased output was evident for all four children, Bianca, Collin, and

Table 2. *Descriptive Scores for Words Read Correctly for Each Participant*

		Baseline	Intervention
Amelie	N (Probes)	3	12
	Raw Scores	3; 2; 3;	4; 4; 5; 5; 8; 8; 7; 8; 8; 7; 9; 12;
	M	2.67	7.08
	SD	0.58	2.31
	Range	2-3	4-12
	Trend	0.00w	0.56
Bianca	N (Probes)	4	11
	Raw Scores	3;4;2;3;	5; 5; 5; 7; 9; 10; 12; 13; 15; 18; 19;
	M	3.00	10.73
	SD	0.82	5.12
	Range	2-4	5-19
	Trend	-0.20	1.52
Collin	N (Probes)	5	10
	Raw Scores	4; 4; 2; 4; 5;	5; 9; 10; 10; 12; 15; 15; 15; 17; 19;
	M	3.80	12.70
	SD	1.10	4.24
	Range	2-5	5-19
	Trend	0.20	1.36
Dario	N (Probes)	6	9
	Raw Scores	4; 3; 3; 5; 4; 4;	5; 6; 8; 10; 12; 12; 13; 14; 17;
	M	3.83	10.78
	SD	0.75	3.90
	Range	3-5	5-17
	Trend	0.14	1.40

Dario clearly demonstrated the most impressive enhancements. Amelie also obviously benefited from the intervention, but her performance curve was not as steep as those of the other three participants.

Table 3 presents the results for some of the most common effect size measures used in single-case research to quantify the magnitude of the improvements: percentage of non-overlapping data (PND), percentage of all non-overlapping data (PAND), improved rate difference (IRD), percentage of data exceeding the median (PEM), percentage of data exceeding the median trend (PEM-T), mean baseline difference (MBD) and (Alresheed, Hott, & Bano, 2013)

Table 3. *Effect Sizes for Words Read Correctly for Each Participant*

	PND	*PAND*	*IRD*	*PEM*	*PEM-T*	*MBD*
Amelie	100	100	1.00	100	100	165.17
Bianca	100	100	1.00	100	100	257.67
Collin	100	93.33	0.90	100	100	234.21
Dario	100	93.33	0.89	100	100	181.46

In all cases, the dimension of the effect sizes was quite impressive, most of the time reaching the maximum value of 100 (or 1.00, respectively). MBD is the only index in Table 2 not quantifying overlap. It represents the percentage of performance increase. As can be seen, Bianca and Collin benefited the most from the intervention, followed by Dario. By contrast, Amelie showed a considerably lower improvement rate, although her mean increase, of about 165%, was still remarkable.

As a supplement, we analyzed the data using inferential statistics. It is becoming a common standard in single-subject research to rely on more than mere visual inspection and effect size measures when drawing inferences from case studies. Multilevel modeling (see Van den Noortgate & Onghena, 2008) was conducted to determine the statistical significance of the intervention effects at the individual level (level 1) and across all four participants (level 2). The level 1 analysis was based on this equation:

$$y_i=\beta_0+\beta_1 Time_i+\beta_2 Treatment_i+\beta_3 (Treatment\ x\ Time)_i+e_i$$

In it, y_i represents the outcome score (in this case, the number of words read correctly within a minute) at measurement i. It is regressed on an intercept, a time variable ($Time_i$) indicating the session number, and a dummy coded variable ($Treatment_i$) to specify which phase it is referring to ("0" stands for the baseline, "1" stands for the intervention). Because we assumed that the time trend in the treatment is different from the time trend in the baseline, we allowed time and treatment to interact: thus, β_0 represents the estimated outcome score at the first point of the intervention, using the baseline regression line; β_1 represents the trend during baseline; β_2 represents the immediate treatment effect of the intervention on the intercept (level); and β_3 represents the intervention effects on the time trend (slope). Finally, e_i indicates a residual (i.e., the error term). Table 4 depicts the results of the level 1 analysis.

The results displayed in Table 4 indicate that – had the baseline continued – the students would have achieved scores of 2.67 (Amelie), 2.50 (Bianca), 4.40 (Collin), and 4.33 (Dario) at the first measurement of their intervention phase. In addition, the indices suggest that their performance would have increased (or decreased) by 0.00 (Amelie), -0.20 (Bianca), 0.20 (Collin), and 0.14 (Dario) words per minute at each probe. Even though the actual outcome gains were higher than those predicted, there was no sudden boost in words read per minute. The scores increased by 1.32 (Amelie), 0.64 (Bianca), 2.16 (Collin), and 0.84 (Dario), from the last baseline to the first intervention measurement. None of these enhancements were statistically significant. However, the interaction between treatment and time came to fall below a significance level of .01 in three out of four cases. Only Amelia's intervention effect on trend failed to reach statistical significance. That is to say that the slope of the performance curve was meaningfully steeper for Bianca, Collin, and Dario during the treatment than it was during the baseline.

To carry out the level 2 analysis, we aggregated the four single cases into one by allowing the participant-specific coefficients β_0 and β_1 to vary across students (represented by the index "j"), using this equation:

Table 4. *Level 1 Analysis for Each Participant*

	Estimate	*SE*	*t*	*p (one-tailed)*
			Amelie	
Baseline level	2.67	1.74	1.53	.077
Trend level	0.00	0.81	0.00	.500
Immediate treatment effect	1.32	1.85	0.72	.245
Treatment effect on trend	0.56	0.81	0.69	.251
			Bianca	
Baseline level	2.50	1.19	2.10	.030*
Trend level	-0.20	0.44	-0.46	.328
Immediate treatment effect	0.64	1.31	0.48	.319
Treatment effect on trend	1.72	0.45	3.86	.002**
			Collin	
Baseline level	4.40	1.14	3.85	.002**
Trend level	0.20	0.35	0.58	.287
Immediate treatment effect	2.16	1.31	1.65	.064
Treatment effect on trend	1.16	0.37	3.19	.005**
			Dario	
Baseline level	4.33	0.71	6.09	>.001***
Trend level	0.14	0.18	0.78	.226
Immediate treatment effect	0.84	0.85	0.99	.172
Treatment effect on trend	1.26	0.21	6.05	>.001***

* significant at the .05 level, ** significant at the .01 level, *** significant at the .001 level

$$y_{ij}=\beta_{0j}+\beta_{1j}Time_{ij}+\beta_{2j}Treatment_{ij}+\beta_{3j}(Treatment\ x\ Time)_{ij}+e_{ij}$$

$$\begin{cases}\beta_{0j}=\gamma_{00}+\upsilon_{0j}\\ \beta_{1j}=\gamma_{10}+\upsilon_{1j}\\ \beta_{2j}=\gamma_{20}+\upsilon_{2j}\\ \beta_{3j}=\gamma_{30}+\upsilon_{3j}\end{cases}$$

The terms β_{0j}, β_{1j}, β_{2j}, and β_{3j} denote the particular sums of a fixed effect *y* and a random subject-specific effect υ. Thus, *y* stands for the overall averages – either for the mean baseline level (y_{00}), the mean trend during baseline (y_{10}), the mean immediate treatment effect of the intervention on the intercept (y_{20}), or the mean intervention effects on the time trend (y_{30}). Table 5 presents the results of the level 2 analysis.

Table 5. *Level 2 Analysis Across All Four Participants*

	Estimate	*SE*	*t*	*p (one-tailed)*
Baseline level	3.44	0.69	5.00	.007**
Trend level	0.02	0.17	0.10	.461
Immediate treatment effect	1.28	0.62	2.06	.038*
Treatment effect on trend	1.19	0.27	4.43	.031*

* significant at the .05 level, ** significant at the .01 level

As the findings indicate, the start of the baseline was significantly different from zero. That said, there was no noteworthy baseline trend. However, other than in the level 1 analysis for the immediate treatment effects, the respective overall averages were ultimately significant. The same was true for the differences in slope between the baseline and intervention phases. Thus, with a probability of error below 5%, the disparities between the gradients of the regression lines in phases A and B cannot be attributed to chance.

Bianca, Collin, and Dario stated that they enjoyed the racetrack game; Amelie liked it a little bit. All participants were under the impression that the training helped them improve at reading the words on the cards and to become better readers in general. However, only Dario remarked that he liked reading now more than he did before. Amelie negated the question; Bianca and Collin stated that they liked reading a little bit better now. Bianca, Collin, and Dario expressly stated that they were fond of the feedback, would be happy to continue with the racetracks, and would recommend the game to other children. Amelie was more critical, indicating that she would neither continue the game, nor suggest it to other students; but she enjoyed receiving the feedback, at least a little bit. None of the participants came up with any remarks that they wanted to add, to supplement what they were asked.

Discussion

This study examined the effects of a reading racetrack game on the word recognition automaticity of four elementary school students with various special needs (learning disabilities, intellectual/developmental delays, speech difficulties, psychomotor problems, oppositional defiant disorders). The results indicated that the treatment can be considered a promising way of supporting learners with diverse challenges to build sight words and improve their reading fluency. All four participants demonstrated remarkable enhancement in their performance. The mean number of words they read during baseline conditions was less than four in every case. As the MBDs indicated, average performance improved by 165.17% for Amelie, 257.67% for Bianca, 234.21% for Collin, and 181.46% for Dario. With the exception of Amelie, the data of all participants demonstrated a slope effect that could not be attributed to coincidence, with an error margin of 1%. However, a level 2 analysis yielded significant trends and slope effects. Overall, the results from the social validity questionnaire reflected a high degree of acceptance of the intervention. Only Amelie commented rather critically on the training. She was the participant with the most severe intellectual limitations and reaped fewer benefits from the treatment than the rest of the group did. There was no way of preventing the children from talking to each other and noticing their improvements, relative to those of the other students. Being the oldest participant and catching on more slowly than the rest of the group was certainly not conducive to making Amelie feel motivated and excited about the intervention.

In any case, overall, the findings of this study were consistent with those from previous studies regarding the effects of reading racetracks on the sight word recognition of students with disabilities (Alexander, McLaughlin, & Derby, 2008; Crowley, McLaughlin, & Kahn, 2013; Erbey, McLaughlin, Derby, & Everson, 2011; Green, McLaughlin, Derby, & Lee, 2010; Hopewell, McLaughlin, & Derby, 2011; Hyde, McLaughlin, & Everson, 2009; Kaufman, McLaughlin, & Derby, 2011; McGrath, McLaughlin, Derby, & Bucknell, 2012; Rinaldi, Sells, & McLaughlin, 1997). It therefore adds to the body of knowledge on this relatively simple and easy-to-implement approach.

However, there were some limitations to this study. First, the number of participants was too small to allow for generalization beyond the context of this experiment. That being said, this single-subject analysis must not be seen in isolation from the already existing empirical basis in support of a causal relationship between racetrack interventions and increased reading performance. One central

purpose of this research was to address the Council of Exceptional Children's claim that case studies on a given topic should be conducted in different geographical locations. However, the findings of this experiment must still be regarded as embedded within the wider context of existing investigations. Another limitation pertains to the fact that I did not collect any follow-up data. Upcoming school holidays made it impossible to continue with the performance measurement, although it certainly would have been beneficial to record some information on the stability of the treatment effects. Finally, using the line diagrams as a way to provide transparent feedback surely helped to keep the participants motivated. However, there is no way to determine the extent to which the increases in achievement were due to the racetrack game or due to the provision of graphical information that showed the children how well they did in previous probes.

On the whole, this single-case analysis provides practitioners with additional arguments supporting the use of the intervention on which this experiment focused, to increase sight word fluency among their students with disabilities. I was able to document a study, not conducted by the working group of Tim F. McLaughlin at Gonzaga University, with results comparable to those presented by McLaughlin and his team. Reading racetracks are a very cost-effective treatment that can easily be implemented into the everyday routine at a given school. Moreover, the content of teaching can be adapted to an individual's learning needs, without difficulty, by changing the words on the cards. Reading racetracks are such a simple technique that one does not even need a teacher to make good use of it. Interns, college student apprentices, parents, or even fellow classmates can function as interventionists. It remains to be seen whether reading racetracks will become more popular in schools, as a mode of effectively increasing sight word fluency in struggling learners, especially those with disabilities, who too frequently fail to receive the individualized care and attention they need.

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The Effectiveness of Google Earth in the Acquisition of Spatial Perception Ability in Social Studies Courses*

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Abstract

The aim of this study is to determine the effectiveness of Google Earth (GE) application in acquiring spatial perception ability in the fourth-grade social studies course. The research was carried out in a fourth grade of a primary school in the Demirci district of Manisa Province in the year 2015-2016 using embedded experimental design. During the five-week implementation process of the research, activities based on the GE practice were performed. A pre-test before the activities and a post-test after the activities were given to the students. In addition, semi-structured interviews were held with the students at the end of the implementation. The Wilcoxon test was used to analyze the data obtained from the achievement test, and the thematic analysis method was used to analyze the qualitative data. The results showed that there was a statistically significant difference between the pre- and post-test scores for the achievement tests. The students also stated that the activities based on the GE implementation increased their success and allowed them to gain spatial skills. In conclusion, the social studies course activities based on GE practice might have an important function for the students to gain spatial perception skills.

Keywords: Primary School, Social Studies Course, Spatial Perception Ability, Google Earth, Mixed Method

Introduction

In parallel with the development of technology in the twenty-first century, many innovations and changes have come up in the world in terms of social and economic aspects. Especially the continuously evolving computer and Internet technology have been used in all areas. This situation has shown its effectiveness in the field of education, and the traditional classroom model has been replaced by new learning environments. In the past, learning needs were met with chalk, blackboard, map, etc.; but today, interactive boards, projections, computers and even tablet computers are used. The integration of technology into education in line with the dynamics and needs of the developing community has become a necessity. Furthermore, with the development of technology, the change in society has also influenced social studies courses whose fundamental aim is socialization. The technology that integrates with the social studies course will help individuals to grow well equipped so that these individuals can supply the needs of the community by using the possibilities of the digital age. The social studies course aims at obtaining new knowledge and skills from the present information, based on a constructivist approach (Özkaral, 2015). In Turkey, the social studies curriculum was renewed in 2005, and the skills needed to be given to the students have been supplied through the new program. In the program, the skills to be given directly for the space perception are integrated with the technology to allow students to gain the skills.

Spatial perception is the process of determining the individual's own location in the space, creating information about the space in their mind, recognizing and understanding the space, finding a place, finding routes and describing places, depending on the route knowledge acquired through the recognition and understanding of the place (Köşker, 2012). It is also the ability to visualize the shapes of objects, to read the drawings related to space, to make various drawings on paper using the observations of spaces and to compare a place with the one drawn on paper (Erdoğan, 2008). Spatial thinking is one of the main forms of intelligence in modern societies; therefore, every individual needs the basic education to develop these necessary skills (Goodchild, 2008). Social studies courses help children to create space-related information and geography consciousness as well as to develop environmental understanding (Öcal, 2007). In parallel with all these explanations, it seems inevitable that, in addition to reflecting spatial perception and spatial thinking skills using the traditional paper and pencil approach, these skills should be used effectively in digital environments by different means and ways. However, it is observed that there is limited research on the acquisition of spatial perception skills of children at primary school age.

In the social studies courses of the primary school, the ability of spatial perception is among the skills to be taught directly. The activities that are prepared in accordance with the learning outcomes are utilized while teaching these skills. These activities are drawing a sketch, finding a route in a map, using a compass and learning the characteristics of weather forecast (Ministry of National Education [MoNE], 2005). It can be said that it is a necessity to take advantage of technology, especially the Internet, in teaching social studies. In addition to the opportunity to gain different perspectives by eliminating distances and boundaries in geographical perception, the Internet offers the opportunity to benefit from primary sources (Friedman & Heafner, 2007). Social studies are taught to young generations to create opportunities to learn about the world in which they live. The information and communication technologies used in these courses enable students to get to know the world more easily (Acun, 2012). Because the social studies courses adopt the constructivist approach, its issues are intertwined with life, and the program's skills aim at enabling students to configure knowledge and to experience it, the social studies course is a program in which educa-

*This study was produced from the PhD dissertation titled "The Effectiveness of Google Earth in the Acquisition of Spatial Perception Ability in Social Studies Courses" submitted to Anadolu University Graduate School of Educational Sciences Program in Primary School Education (2017).

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tional technologies can be applied easily (Ersoy, 2013). The use of technology in social studies courses can increase the interest of students who are afraid of social studies courses (Heafner, 2004). Google Earth (GE), which is an application that shows the Earth on the Internet and can access to all residential areas, is an effective and technological tool in primary school social studies courses. GE also has a critical role in gaining spatial perception skills.

The GE application is a tool that transfers the real world into a three-dimensional web environment and provides the connection between the real and the virtual world by presenting tangible visuals to individuals (Jensen, 2010). Students can easily use GE in social studies courses due to accessibility and ease of use. GE also supports thinking and helps students learn about natural and cultural phenomena, and as an interactive tool, it helps teachers to give information about places. Students are more likely to learn about certain qualities of places and have the opportunity to observe the interaction between places and human relations (Patterson, 2007). Moreover, GE is a tool far beyond the traditional GIS applications as it allows for collecting information instantly from different sources (Goodchild, 2008). Teachers may plan lessons to help students understand the natural and cultural events (Guertin & Neville, 2011). Awada and Diab (2018) have recently put forward that the GE application supports critical thinking and spatial analytical operations, and consequently, increases learner-centered learning and student motivation. Furthermore, focusing on asking students to use technology in order to give meaning to the world around them enable for new searches in the childhood and educational environments (Danby, Davidson, Ekberg, Breathnach, & Thorpe, 2015). Xiang and Liut (2017) also state that the GE application gives students better opportunities to observe and interpret the changes in nature, and thus, it helps them understand the complex structure of changes. In this way, it incerases students' ability to define and analyze the spatial and time changes. An individual who looks at the environment from a cognitive standpoint can learn the places and objects around him/her in a more meaningful and useful way. There is a limited number of researches on the ability of space perception at the primary school level and on the "space perception problems" encountered in daily life, which triggered the present research. The main purpose of the present study, then, is to determine the effectiveness of GE application in acquiring spatial perception skills in social studies courses. For this purpose, the study sought the answers to the following questions:

- What is the level of spatial perception skills of the students before the GE application process?
- How was the training process of GE application carried out in acquiring spatial perception skills?
- What are teachers and students' views on the use of GE application in acquiring spatial perception skills?
- Did the GE application significantly affect the spatial perception skills of the students?

Method

Since both the qualitative and quantitative research methods are used for studying the development of spatial perception skills, the research was designed as a mixed model. In the mixed model, the qualitative and quantitative methods are used together to explain the research question in more detail (Creswell, 2009). The mixed model has four main designs: embedded, explanatory, exploratory, and parallel. There are two types of embedded design: embedded experimental design and embedded correlational design. The embedded experimental design was used in the research. Here, the main research question was answered with the quantitative data using the experimental design. The qualitative data, which were related to the experimental process, were collected during the implementation process (Plano Clark & Creswell, 2015). Plano Clark, Huddleston-Casas, Churchill, Green and Garett (2008) stated that the embedded experimental design is useful for researchers who are willing to expand their quantitative data with qualitative data. The present study, therefore, was designed as a pretest post-test experimental design. The qualitative data, in this respect, were obtained as embedded into the quantitative data. In other words, the primary research tool is quantitative as the the qualitative data present a supporting and secondary point of view throughout this study. In Figure 1, the embedded experimental design used in the study is described schematically.

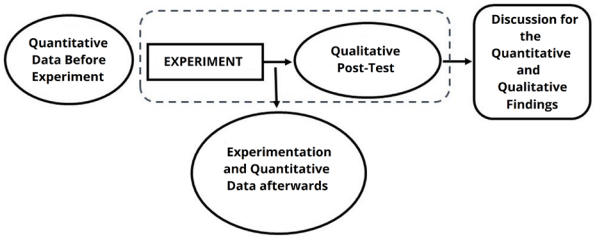

Figure 1. Embedded Experimental Model

As shown in Figure 1, if quantitative data is used to answer the main research question of the experimental design, and if qualitative data is used to search for an answer to the secondary research question in connection with the experimental process before and after the implementation, the design to be selected must be the embedded experimental design (Plano Clark & Creswell, 2015).

Participants and Research Context

The research was conducted in the fourth grade of a primary school in Demirci, Manisa, Turkey during the fall semester of the 2015-2016 academic year. Criterion sampling was used in selecting the class used for this study. Criterion sampling is based on studying all contexts that correspond to a set of predefined criteria. The criteria mentioned here can be determined by the researcher or by a list prepared earlier (Yıldırım & Şimşek, 2013). In the selection of the research school, it was determinative that the school administration and the teachers stated that they would participate voluntarily in the research, that they would allow the camera records and that the teacher had already done academic studies because he was the person to apply the implementation. The classroom organization and the physical appearance where the research was conducted is shown in Figure 2.

Figure 2. The Class Organization and Physical Appearance

The fact that no student had used GE, which was the basic application of the research, was also among the outstanding information. The research was carried out with 14 students in the classroom. Nine of the students in the class were male

and five were girls. Nine students had computers at home, five did not have. Seven of them had an Internet connection, and the other seven did not have one.

Experimental Process

The implementation stage of the research was done by the teacher, and the researcher made the necessary explanations to the teacher. Then, the researcher started the observations in the classroom before the experimental procedure began. Following the observations, the personal information forms were given to the students. After giving the pre-test, the experimental process began.

The experimental process of the study was carried out for a total of five weeks. In social studies courses, the practice of developing spatial perception skills along with GE practices lasted for 10 hours of study in the "Where We Live" unit.

The experimental process started with the preparation of appropriate lesson plans after the researcher determined the learning outcomes and established the GE application to the computers used by the students in the course. While preparing the lesson plans, students' background knowledge was taken into account, and activities that would allow them to participate in the experiment process actively were prepared. In the activities of the lesson plans, the participation of the students as a full practitioner in the process was realized under the management of the teacher in accordance with the constructivist approach. Before the experiment, the class teacher was given the necessary instruction related to employing the lesson plans using the GE and each lesson plan was discussed thoroughly before the lessons were delivered. In this context, the teacher started the course by introducing the GE program to the students and then applied the course plans in accordance with the learning outcomes and activities. During the experimental process, the teacher ensured the full implementation of all plans and enabled all students to participate effectively in the activities. After the activities were completed, the post-test was applied, and finally, the semi-structured interviews were conducted.

Data Collection Tools

In the data collection process of the study, data collection tools for two different types of data were used according to the research questions because both quantitative and qualitative research methods were utilized. A personal data sheet, participant observation, and semi-structured interviews were used as the qualitative data while an achievement test, developed by the researchers, was used as the quantitative data. The achievement tests developed by the researchers were the pre-test and the post-test applied before and after the activities. To find the reliability of the achievement test, the test-retest method was conducted with 138 students in the 2014-2015 academic year. The test-retest score showed that the values of 10 people appeared as extreme values, so they were out of the process. Test-retest correlation was 0.73. This value indicates that the achievement test is sufficiently reliable. The final version of the achievement test has 20 items in four factors: sign knowledge, sketch reading, region knowledge, and concept knowledge. Moreover, activities carried out during the experiment were video recorded. At the end of the application, semi-structured interviews were conducted with both the students and the teacher.

Data Analysis

An achievement test was used as the pre-test and post-test to determine the effectiveness of GE in acquiring spatial perception skills in social studies courses. The obtained data were analyzed using SPSS software. As there were fewer than 30 participants, Nonparametric Wilcoxon test was applied for repeated measurements to determine the difference between the pre-test and post-test scores of the students involved in the study.

The qualitative data were analyzed by the researchers using the thematic analysis. Thematic analysis is a method of detecting and analyzing content patterns in qualitative data. Braun and Clarke (2006) define thematic analysis as a method of analysis rather than a method of science as thematic analysis does not specify theoretical assumptions, appropriate research questions, or appropriate data collection methods. Thematic analysis can be used in a wide range of theoretical frameworks from basic experimental analysis to constructivist, critical analysis (Taylor & Ussher, 2001).

Finding and Results

The quantitative findings obtained from the statistical analyses and the qualitative findings obtained from the participant observations, video recordings, and the interviews are presented below.

Quantitative Findings

In the study, a social studies course was conducted with the 20-item achievement test developed to determine the students' prior knowledge about their "Where We Live" unit.

Table 1. *Pre-test Scores*

Score range	*f*	Mean (*M*)	Standard deviation (*sd*)
0-10	0		
11-20	1		
21-30	2		
31-40	6		
41-50	5		
51-60	0	35.429	8.582
61-70	0		
71-80	0		
81-90	0		
91-100	0		
Total	14		

According to the data given in Table 1, the scores obtained from the achievement test before the courses prepared with activities of GE application were found as follows: *M*= 35.429 (*sd*= 8.582). We observed that the students' prior information about the "Where We Live" unit is very low.

As a result of the experimental study on the acquisition of spatial perception skills of GE application, the achievement test was applied again, and the results are presented in Table 2.

According to Table 2, after the courses with GE activities, the scores obtained from the achievement test were calculated as *M*= 80.429 (*sd*= 3.956). When the scores obtained from the achievement test are examined, it is observed that the teaching and course activities for the students were very successful, and the learning increased. It was clear that almost all of the students increased their level of knowledge on the topics of "Where We Live" unit.

The Wilcoxon test was applied to identify the significance of the changes in the scores before and after the experimental procedure (Table 3).

Table 2. *Post-test Scores*

Score range	*f*	Mean (*M*)	Standard deviation (*sd*)
0-10	0		
11-20	1		
21-30	2		
31-40	6		
41-50	5		
51-60	0	80.429	3.956
61-70	0		
71-80	0		
81-90	0		
91-100	0		
Total	14		

Table 3. *Wilcoxon Test Results*

		N	Mean ranges	Sum of ranges
Post-test Pre-test	Negative Ranges	0[a]	.00	.00
	Positive Ranges	14[b]	7.50	105.00
	Equals	0[c]		
	Total	14		
	Z	3.296[b]		
	p	.001**		

a. post total < pre total
b. post total > pre total
c. post total = pre total

The number of positive ranges of students (14) is higher than the number of negative ranges (0), which can be seen from Wilcoxon test results. The Wilcoxon *Z* value (*Z*= -296), which tests whether this difference is meaningful, is significant at 0.01 level. The post-test scores of the students involved in the study are significantly higher than the pre-test scores. In other words, the experimental process increased students' scores. This change is shown in Figure 3 below.

The results of the analyses of both the pre- and post-test scores for the four sub-factors of the achievement test are presented in Table 4.

As Table 4 shows, the pre-test score average of the sign knowledge factor (question 18, 20, 7, 3, 2) was calculated as (*M*= 3.9286), (*sd*= 3.33891). While students can get 25 points from the pre-test questions, they have a maximum score of 11 and a minimum score of 0. The post-test point average of sign knowledge factor was calculated as (*M*= 19.8571), (*sd*= 2.76954). The students received 25 points from the post-test questions, and they received 15 points as a minimum. The average of pre-test scores of sketch reading knowledge factor (question 15, 1, 19, 17, 6) was calculated as (*M*= 5.3571), (*sd*= 2.89846). While students can get 25 points from the pre-test questions, they have a maximum score of 11 and a minimum score of 0. The post-test score average of sketch reading knowledge factor was calculated as (*M*= 19.1429), (*sd*= 2.76954).

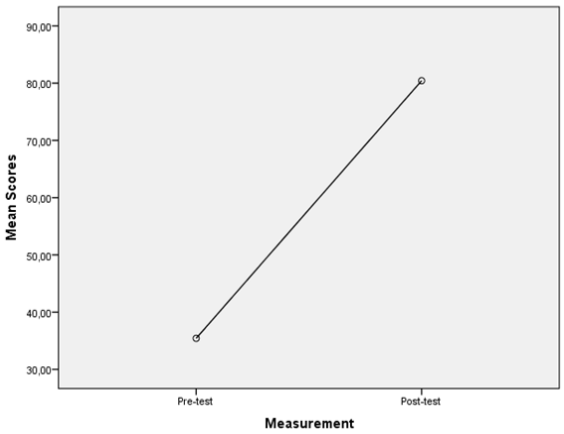

Figure 3. Pre-test and Post-test Measurement Chart of Experimental Process

The students received a total score of 23 and a minimum score of 15 from the post-test questions of sketch reading knowledge factor. The pre-test score average of the concept knowledge factor (questions 9, 14, 5, 11, 8, 12) was calculated as (*M*= 18.2143), (*sd*= 4.64391). While the students can get 30 points from the pre-test questions of the concept knowledge factor, they have a maximum of 25 points and a minimum of 10 points. The post-test score average of concept knowledge factor was calculated as (*M*= 27.1429), (*sd*= 2.56776). The students received 30 points, which is the full score from the post-test questions of a concept-information factor, and the minimum score of 25 points. The region knowledge factor (questions 10, 4, 13, 16) of pre-test score average was calculated as (*M*= 7.5000), (*sd*= 3.25222). While the students can get 20 points from the preliminary test questions, they have a maximum score of 15 points and a minimum of 5 points. The post-test score average of region knowledge factor was calculated as (*M*= 14.2857), (*sd*= 3.31497). The students took the full score of 20 points and the minimum

Table 4. *Descriptive Statistics of Scores at the Level of All Sub-factors*

		Pre-Test				Post-Test			
	N	Mean	*sd*	Min.	Max.	Mean	*sd*	Min.	Max.
Sign Knowledge	14	3.9286	3.339	0	11	19.8571	2.770	15.00	25.00
Sketch Reading Knowledge	14	5.3571	2.899	0	11	19.1429	2.770	15.00	23.00
Concept Knowledge	14	18.2143	4.644	10	25	27.1429	2.568	25.00	30.00
Region Knowledge	14	7.5000	3.252	5	15	14.2857	3.315	10.00	20.00
Total	14	35.429	3.956	15	47	80.429	3.956	74	88

score of 10 points from the post-test questions of region knowledge factor.

The results of the analysis of whether there is a significant difference between the pre-test and the post-test at the total score level displaying the changes of the students' scores belonging to the sub-factors before and after the experimental process are given in Table 5 below.

Table 5. *Table of Range Differences in All Sub-factors*

	Z	*p*		*N*	Mean ranges	Sum of ranges
Sign knowledge Post-test - Sign knowledge Pre-test	-3.301	.001*	Negative Ranges	0	.00	.00
			Positive Ranges	14	7.50	105.00
			Equals	0[c]		
			Total	14		
Sketch Reading Post-test - Sketch Reading Pre-test	-3.309	.001*	Negative Ranges	0	.00	.00
			Positive Ranges	14	7.50	105.00
			Equals	0		
			Total	14		
Concept knowledge Post-test - Concept knowledge Pre-test	-3.228	.001*	Negative Ranges	0	.00	.00
			Positive Ranges	13	7.00	91.00
			Equals	1		
			Total	14		
Region knowledge Post-test - Region knowledge Pre-test	-2.961	.003*	Negative Ranges	1	4.00	4.00
			Positive Ranges	12	7.25	87.00
			Equals	1		
			Total	14		

As a result of the Wilcoxon test (Table 5), the number of positive ranges of students (14) is more than the number of negative ranges of students (0). The Wilcoxon *Z* value (*Z*= -3301), which tests whether this difference is significant, is significant at 0.01 level. The student's post-test scores for the sign knowledge is higher than the pre-test scores. In other words, the experimental process increased the student's sign knowledge sub-score points.

As can be seen in the result of the Wilcoxon test (Table 5), the number of positive ranges of sketch reading sub-factor (14) is higher than the negative ranges (0). The Wilcoxon *Z* value (*Z*= -3.309) is significant 0.01 level. The post-test scores of the students' sketch reading are significantly higher than the pre-test scores. We can say that the experimental process increased the sketch reading sub-factor scores of the students.

The number of positive ranges of concept knowledge sub-factor is higher (13) than the negative ranges (0). The Wilcoxon *Z* value (*Z*= -3.228) is significant at 0.01 level. The post-test scores of concept knowledge are significantly higher than the pre-test scores. In other words, the experimental process increased the students' concept knowledge sub-factor scores.

As can be seen in the result of the Wilcoxon test (table 5), the number of positive ranges of region knowledge sub-factor is higher (12) than the negative ranges (1). The Wilcoxon *Z* value (*Z*= -2.961) is significant at 0.03 level. The post-test scores of region knowledge are significantly higher than the pre-test scores. Thus, experimental processing increased students' region knowledge sub-factor scores.

According to the results of the achievement test, which constitute the quantitative part of the study, the students' spatial perception skills increased significantly with the application of GE-based activities.

Qualitative Findings

The semi-structured interviews were held with the students and teacher in the classroom where GE-based activities were implemented. Through the thematic analysis of the data obtained from the interviews, the main theme of "Google Earth Application in Social Studies Courses" was determined. Within this main theme, "Spatial Perception, Social, Emotional and Technological Dimensions" were classified as four sub-themes. In the interpretation of the themes, direct quotations were made to the teachers' responses, to interview questions, and to video recordings. The themes are given in the form of a puzzle (Figures 4 and 5), and the parts forming the sub-themes are shown in two ways. Regarding the spatial perception dimension, red color was used in the puzzle form, and the yellow color was also used because it was thought that the situations forming the technological, emotional and social dimensions could affect each other. The theme of "Google Earth Application in Social Studies Courses", which is the main theme with orange color, is reached with the integration of all parts. Based on the opinions of teacher and students, the contents of technological, emotional and social dimensions are thought to transmit information to each other.

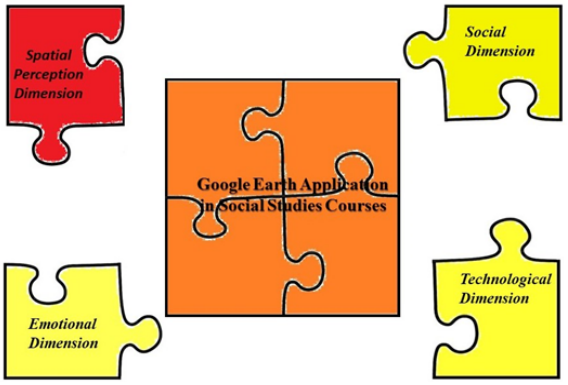

Figure 4. The Dimensions of GE Implementation in Social Studies Courses

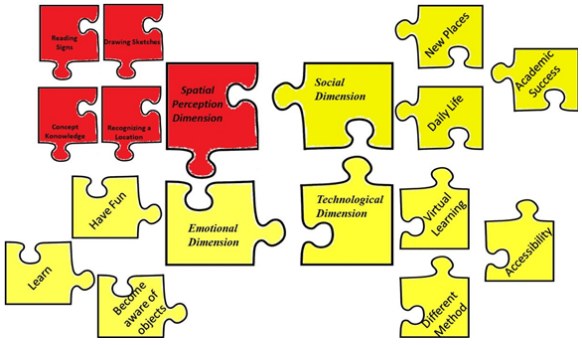

Figure 5. The Lower Dimensions of GE Implementation in Social Studies Courses

Spatial Perception Dimension

The theme of the application of GE in social studies courses detected by the interviews with the teacher and stu-

dents after the implementation and by video recordings of the classroom is the dimension of spatial perception. This dimension is more concerned with the academic skills and competencies that students gained. These are conceptual knowledge of the ability for drawing sketches, reading signs, recognizing a location and perceiving space. They also fit well with the skills used in activities related to spatial perception skills, including the identified factors of the achievement test that form the quantitative part of the study.

The classroom teacher explained that the activities carried out with GE practice directly affected spatial perception skills and that the direction-finding skills, direction-describing skills, shortly, space perception skills increased, and that students were able to find places of interest in the world and that they had a lot of fun in doing these things and developed themselves. In this interview, the teacher made evaluations based on the views given below within the scope of the spatial perception dimension:

> *Space perception remains as a little abstract concept in primary schools. Well! I am now the teacher of the fourth grades, the fourth grades are the highest grade of primary school, and that is, they are in the closest age group to the abstract perception period. But, of course, children's learning by seeing things in three dimensions contributes more to their learning, that is, it is easier for them to perceive something they see and live in, thus they can transform it into behavior, being more effective rather than teaching it abstractly. For example, if they are curious about the Eiffel Tower in Paris, they go immediately. They find the Eiffel Tower and see its photographs, can find important buildings, and can interest in the weather there. I mean, they felt like traveling there, and they had a good time. I can notice that their concepts of direction enhanced very nicely. I think we have seen it in the post-tests. When we talk about direction concepts in routine courses, I can feel that the subject is easily understood. For example, when describing a place, "here you will go, will turn this way from the grocery store" expressions changed, and the children began to use statements such as "You will turn to the south from the mosque, you will turn to the north" (Interview with the teacher, 20 Jan 2016).*

After using GE, the students stated that they could read the signs they encountered in daily life, they learned the concepts that created spatial skills, they could perceive and find the location of their destination, and they could easily sketch the places they knew. Examples of some students' opinions on this subject are given below.

> *I learned directions, I learned weather, and for example, I can learn the weather from meteorology. I knew a little about the directions but began to know much more. I've seen the weather, and I've seen everywhere I wonder. Here it is... In my daily life, for example, when I am lost, I find my ways with the directions, and for example, I can look at the weather when I go out (Interview with Haşim, 13 January 2016).*

> *For example, my painting was bad, I could not draw a sketch, but I was able to draw a sketch with GE. When describing the location of my house I used to have difficulty, I'm doing it right now with GE (Interview with Melike, 14 January 2016).*

Haşim stated that his direction concepts developed with the GE application, his knowledge of locations increased, he can use the direction concept better in daily life and learn weather events easily. Melike shows that they made progress in drawing sketch, but also that they increased their concept knowledge by associating the sketch with a bird's eye view. Melike also stated that her ability to find direction was better than the past and she could describe direction more easily.

When interviews and video recordings are examined, it is found that the use of GE in social studies course contributes to sketching, direction and location skills, conceptual information including knowledge of signs and natural or human-made spaces, and the sign knowledge consisting of weather and symbols. It is supported by the opinions of the teacher that the use of GE directly contributes to the spatial perception skills, and the students showed this with practical examples. It is seen how useful GE practice is from the sketches that students drew before and after by using GE in social studies courses (Figure 6).

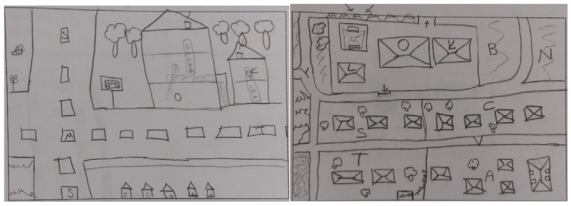

Figure 6. Sketches Before and After the Training

Emotional Dimension

One of the reflections of the GE application emerging after the analysis of the opinions of teachers and students and video recordings of the application is the emotional dimension. After the use of GE in social studies course, students have fun, learn, and become aware of the objects, settlements around them, which constitute the issues of emotional dimension. The teacher and students were very happy and entertained while using GE application, and they also saw images of different assets and places and learned new information. During the interview, the class teacher stated that the application of GE was very comprehensive, that it excited the students and attracted their attention, that it enabled them to access all kinds of information so that the courses were efficient. The teacher's opinion on this subject is given below:

> *When I evaluate the GE software, I can say these. GE software is a very comprehensive software and attracted the attention of children. They were thrilled when I first talked about it. Their using computers, learning how the program works, mastering the program, getting access to any kind of information also excited them. The course was efficient, the program was nice from that point of view (Interview with teacher, 20 January 2016).*

It was observed that the students were very excited to take lessons with an application they had never seen before. This situation has become a state of learning by having fun with new learning as the program is used. Learning while having fun facilitated the teacher's work as well as ensuring that the information became permanent. The statements reflecting the students' thoughts on this subject are as follows:

> *It was a little surprising to me and it was pretty. I think it was a good way to learn the place we live. I learned a lot (Interview with Deniz, 12 Jan 2016).*

> *It was so beautiful, I had a lot of fun. It was so beautiful to look down on the world like this. It was a lot of fun (Interview with Sena, 12 Jan 2016).*

> *It was very beautiful, very excited. It was very educative. Everyone had a lot of fun (Interview with Ilayda, 12 Jan 2016).*

Deniz also said that it was very surprising and fun to learn about GE software and that it was very effective in the learning of the "Where We Live" unit. Sena also stated that GE software is very good and that it is fun to look at the world from the top. Ilayda stated that the GE application was very exciting and enjoyable and that it has educational features.

Students lack information because they can't go to some of the places around them and in nearby cities. For example, Rumeysa, who did not know that Pamukkale was

white [an ancient place in Denizli, Turkey], learned its color when she saw its photograph with the GE application. Through GE application, students improved their ability to learn shape, color, and orientation of important places that they formerly are not aware of, by structuring their old knowledge, this inference can be reached through the interviews or video recordings. The following dialogue was between the teachers and students in the process of the course with the GE application:

> *Rumeysa: Teacher! Is this Pamukkale?*
>
> *The teacher: Let me look, yeah right.*
>
> *Rumeysa: I've never been here before, it's so white.*

The teacher and students mentioned that GE practice was fun and that learning became effective while having fun. With the GE application, students noticed the places that they knew but did not see it. Therefore, the GE application mobilized students' emotional responses.

Technological Dimension

One of the reflections of the GE application emerging after the analysis of the video recordings and the feedback from the teachers and students participating in the application is the technological dimension. After using GE in social studies course, having easy access to the information that students and teachers need, using a computer in addition to classical textbooks, in other words, teaching with a different method, and learning in virtual environment constitutes the subjects of technological dimension. The GE application, which was used as a different method, motivated the students and contributed to their learning. With the use of GE in social studies course, the classroom teacher used technological materials instead of traditional ways of routine teaching. The courses have become more efficient and students have used the application themselves. Thus, the courses became appropriate to the logic of constructivist social studies education. At the same time, the teacher stated the students' acquisitions from the social studies course as follows:

> *We went out of routine. For example, when we follow the textbook, I was giving kids a reading paper the day before, and I was giving them a job so that they came prepared. After that, we were studying. We were solving the necessary questions. They got out of the routine. They used it themselves, so we just guided them. It was very productive and effective in that respect. According to the location of their home or schools, different institutions, as I said, they can express the direction of different places in the form of the south, north etc. They couldn't say it if we'd just follow, you know, the regular textbook. They could only say the directions of the north-south according to the sunrise. But when they state directions to a place from their location, they could not use expressions like the south and the north. But now they are doing it with GE, they are doing it clearly (Interview with the teacher, 20 January 2016).*

For students who met with a new tool in addition to the books used in the lessons, the computer and GE application has become a different method. The ability to go to any place they want and to see there has benefited both the teacher and the students in terms of accessibility. By using the computer, the virtual learning provided by digital images has been realized. Aslı stated that she had developed academically, that after using GE she could solve questions, and that using computers in lessons is a new method. We observed that students were motivated when they were out of classical methods. Melike and Basri expressed their views that GE practice was a new method used in social studies course, and that they were now working on a computer with GE application while they were only working on books and project homework before. The views of these students are given below:

> *The computers came. We've learned everything from GE, for example, we could never see our world, but now we've seen it. I can now answer when the teacher asks questions (Interview with Aslı, 13 January 2016).*
>
> *We used to do it from the Book, but now we can use the computers sometimes (Interview with Izzet, 14 Janary 2016).*
>
> *In the past, our materials were different, now we have used technological products (Interview with Melike, 14 January 2016).*
>
> *In social studies, we used to do books and project homework. Now we are doing it on the computer, I think this is the changed thing (Interview with Basri, 12 Jan 2016).*

The GE application used in social studies course facilitated the accessibility of students to information. Unlike classical classroom tools, a method that follows the latest developments of technology brings the advantages of technological dimension to the students by going beyond routine and learning with the introduction of reality within the virtual environment. Students can access information about routes, directions, different locations and weather more quickly and easily, and it can be concluded that this contributes to the learning process of students.

Social Dimension

The last reflection of the GE application emerging after the analysis of the opinions and video recordings of the teacher and students participating in the application is the social dimension. Following the use of GE in the social studies course, the students and teacher found important historical artifacts in their surroundings and places all over the world. The students got the information they need and succeeded in lessons and exams and completed their own deficiencies compared to the other students.

The teacher mentioned that the students understood about the GE activities and that they were doing activities as from school-to-house and from house-to-school as the orientation activities. The teacher stated that the students found the location of important places, were able to understand and knew about everywhere they interested:

> *The children understood well the subject, and after learning how to handle and where to find them, they were able to find all the centers they wondered about in the world. They found the places, they could find the directions, their homes, and their schools. They were able to find institutions such as governmental institutions in Demirci [The district where the students lived]. Now, when someone is asking for directions, the kids can easily express directions like "go that way to the north or south". Well, it was productive at that point. For example, they were curious about the Great Wall of China. They were wondering about Pamukkale, some saw their photographs the first time, and it was very positive in this respect as if traveling the world. So, we can count many positive aspects (Interview with teacher, 20 January 2016).*

Mehmet and Rumeysa stated that they discovered new places, visited different countries virtually and learned about new places. Rumeysa said she felt like she was driving around the world with GE applications. She mentioned the availability of GE in daily life by stating how realistic it is. Haşim, Semih, and Izzet stated that their success increased with the GE application, that they could draw more easily, knew the ways they used to go home from school and travel to the city.

> *We searched the cities and we tried to find other ways in the city. We traveled with it everywhere and saw the natural and human-made places. It was so nice to find grades, we just could learn better when we looked at it, it would be better to look at these places through the GE instead of looking at it on TV. I think my performance has changed. I used to stir North-East or North-West, now I am not stirring (Interview with Mehmet, 12 January 2016)).*

> *With the aid of the GE application, I've seen things that I had never seen before. I felt like I was driving. GE application has helped us learn more easily. If I ask how the weather is, it shows immediately. I learned easier because it helps in everything (Interview with Rumeysa, 14 January 2016).*
>
> *Some of my answers in the exams were wrong. Wrong answers don't come out anymore even about the weather. In my daily life, for example, I can find directions when I was lost, and for example, I can look at the weather when I am going to go out. We also looked at the bird's-eye sketch in the GE program. Then we can do it with our book without the GE program (Interview with Haşim, 13 January 2016).*

Students have seen and identified new places they see on TV, in books, or hear from others, by GE application and satellite photos. The place each student wants to see changed according to their interests and needs. Especially when boys were searching to see the country of footballers and basketball players, girls wanted to see cities like Paris, Venice. This shows that the desire to learn new places is an important issue within the social dimension. Increasing the students' success in the classes allowed them to acquire a special place among others socially. After the implementation of GE, the students' success in the courses contributed to the development of their self-confidence, as well as to the necessary information in daily life like learning weather, finding location, etc. From here, it can be assumed that the application of GE plays an important role in the class in terms of socialization.

In general, we can conclude that the issues in social dimension have an important place in eliminating the individual needs of the students and that employing the GE in social studies courses can contribute positively to the development of the students.

Results and discussion

In the social studies course, the recruitment of activities based on GE implementation was observed to improve the students' space perception skills. Statistically significant differences were found between the pre-test and post-test scores of the students who participated in the application. This finding is consistent with the results of some research conducted with GE application (Xiang & Liut, 2017; Demirci, Karaburun, & Kılar, 2013; Koçak, 2013; Öğütveren, 2014; Thankachan & Franklin, 2013; Westgrand, 2010; Qiu, 2006). In this context, it can be said that the activities based on the GE application used for improving the spatial perception skills of students in the social studies courses are effective.

In the research, the spatial perception skill, the ability to read the signs, drawing the sketch, the spatial conceptual knowledge skills and the location perception skills of the students were determined to increase. These results were similar to previous research (Blank, Almquist, Estrada & Crews, 2016). In their study, Ratinen and Keinonen (2011) use the GE to improve teacher candidates' geographic thinking levels, despite the development of the geographical level of teacher candidates, map analyzing and geographical data still remain difficult for them. These results include similarities and differences with our results. It can be assumed that the differences arise from the level difference between groups and that issues and learning outcomes occurred as a result of the effects of national differences and the measurement instruments.

Within the scope of GE practices, the teacher and students expressed positive views on the subjects and contents of the activities. The students, who noticed their surroundings, stated to have fun and learn during the activities prepared with GE application. The teacher said that the courses were very different, the students' motivation increased, the students had a lot of fun, they were interested in the course and their learning process was successful. The teacher said that the students noticed the environment and world since GE is a very comprehensive application. Students and teachers expressed views that they have learned new places with GE practice, they have easy access to their places of interest, and that they have developed themselves in sketching and finding directions. Öcal (2007) stated that the students had great difficulties in spatial cognition about their immediate environment and that they had problems in describing their school environment and their place of residence, but they had more information about distant cities and countries. This can help us achieve the conclusion that the GE application is an important tool for the development of spatial perception. Some studies concluded that the GE application is more effective and useful than the traditional maps, and the issues in the social studies curriculum are appropriate for GE use (Demirci & Karaburun, 2011; Edstrom, 2013; Karakuş & Oğuz, 2013, Xiang & Liut, 2017). We observed that the technological materials used in GE application in the classroom were very different from the course materials and methods used in the past, thus increasing the level of motivation and learning of the students. Teaching the concept of spatial perception, an abstract concept, with GE practice made the issue to become more concrete. The teacher who stated that the three-dimensional real images contributed to learning through seeing and practicing by the students reported that the students transformed knowledge into behavior with virtual learning, which was also observed in the video recordings.

Due to the easy accessibility of the GE application, students can use its required aspects such as weather, roads and sketch in daily life and can reach a quick conclusion. Students who are looking for a place they are interested in can easily find that place and see all the features of the GE application and reach the information they need. The fact that GE application, which is an application that can be used with computers, includes information about all over the world, allowed us to think that it will help social studies course not only due to ease of use but also due to the accessibility of information. We observed that the students, who have difficulty finding and describing their directions before using GE practice, could find the directions and their positions easily, and for the questions asked about their directions, they easily and accurately used the concepts of direction that is in the scope of social studies course acquisitions. The teacher also expressed views that the students' development in using the concepts of direction and location after GE implementation increased.

According to the results of the research, the use of GE has enabled students to develop positive attitudes towards social studies course and to increase their participation and motivation. For this reason, the GE application can be used for all learning outcomes that are consistent with the logic of the education program. Teachers' use of GE in classrooms will help students actively demonstrate themselves in the classroom, and it will help to transmit the information directly to the actions. Therefore, teachers and school administrators should give the necessary information and guidance so that technological applications such as GE application can be used in the courses. Problems caused by a lack of technological infrastructure in most schools can lead to difficulties in the use of new applications such as GE. Therefore, teachers hold the main responsibility. They must communicate with the necessary institutions and work for the establishment of the infrastructure; they can also use individual technological materials with students at the school.

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The Inefficiency of Vocabulary Instruction

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Abstract

Several researchers have advocated explicit instruction of vocabulary in order to help students improve their reading comprehension, especially low-achieving readers who need to "catch-up" to their age peers. Very few studies, however, have attempted to compare the time efficiency of direct instruction to its alternatives. In this review, I calculate the efficiency of vocabulary instruction in 14 studies taken from a recent research review (Wright & Cervetti, 2017). I then compare those results with estimates of vocabulary acquisition via a likely alternative source of vocabulary growth, free reading. Free reading was found to be 1.7 times more efficient than direct instruction in building vocabulary in short-term treatments, and 12 times as efficient for long-term treatments.

Keywords: Vocabulary Acquisition, Vocabulary Instruction, Pleasure Reading, Efficiency

Introduction

Success in school rests in significant measure on the ability to understand what one reads. Reading comprehension is in turn strongly influenced by one's vocabulary knowledge (Anderson & Freebody, 1981). Some researchers have concluded that the best way to help students improve both reading comprehension and academic achievement is through some form of direct, systematic vocabulary instruction (Beck, Perfetti, & McKeown, 1982; Biemiller & Boote, 2006; National Reading Panel, 2000; Stahl & Nagy, 2007; Stahl & Fairbanks, 1986). More recently, those emphasizing the importance of acquiring "academic" vocabulary have recommended teaching these words directly to students (Nagy & Townsend, 2012; Snow, Lawrence, & White, 2009).

While vocabulary instruction typically leads to some gains in word knowledge, not all instruction improves reading comprehension. In particular, vocabulary instruction that is limited to giving students the definitions of words – "shallow" instruction – often has little impact on comprehension of texts that contain those words (e.g. Pany & Jenkins, 1978; Pany, Jenkins, & Schreck, 1982). In place of shallow instruction, some researchers have proposed a more time-intensive "rich" instruction that, they claim, will lead not only to greater word knowledge but also increased comprehension. Beck, McKeown, and Omanson (1987), for example, identified several elements of what they considered effective rich vocabulary instruction, including:

> • Providing clear definitions;
>
> • Having students "manipulate" words in "rich and varied ways," describing how words relate to each other;
>
> • Requiring students to discuss words and give "justifications for the relationships" among words they discover;
>
> • Encountering the words frequently and in different contexts;
>
> • Encouraging the use of words outside of the vocabulary lessons (p. 149)

Some words are considered better candidates for this more extensive form of vocabulary instruction than others. Beck et al. (1987) categorized words into three "tiers" in order to determine appropriate targets for instruction. Basic vocabulary ("Tier 1") consists of words that most students will acquire by the early grades (e.g. cat, mother, talk, chocolate), and are therefore not good candidates for instruction. "Tier 3" words are those that are either used rarely or limited to a specific domain, the latter often referred to as technical vocabulary (e.g. photosynthesis, tidal pool, cosine). These again would not be good targets for instruction, since they can be learned "when the specific need arises, such as presenting nebula during a lesson or discussion of the solar system" (Beck et al., 1987, p. 155). Beck et al. recommend that teachers instead focus their vocabulary instruction on "Tier 2" words, those that are "of general utility not limited to a specific domain" (p 155). These are also sometimes called sub-technical words (Cowan, 1974), and can be found in a wide variety of genres and subject matter texts (e.g. influence, ponder, retort, thread).

Most vocabulary interventions have identified these words based on teacher or researcher judgment. A few more recent interventions have used words from the Academic Word List (AWL) (Coxhead, 2000). The list consists of 570 word families thought to be especially important in academic reading. Ming-Tzu and Nation (2004) found that the AWL word meanings were roughly similar across disciplines, meaning that acquiring an AWL word in one domain will be beneficial in other academic disciplines as well.

Studies of the effects of teaching words on reading comprehension have produced mixed results. Stahl and Fairbanks (1986) found a modest effect of instruction on standardized reading tests (d= .30) but a much stronger one for researcher-created passages that contained the words taught in the intervention (d= .97). Elleman, Lindo, Morphy, and Compton (2009), reanalyzing several of the same studies included in Stahl and Fairbank's review, found the effects of vocabulary instruction on comprehension were far lower, with no significant impact on standardized measures (d= .10) and modest but significant effects on researcher-created tests (d= .50).

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Wright and Cervetti's (2017) narrative review of vocabulary instruction studies came to a conclusion similar to Elleman et al.'s (2009). They found that words taught in certain interventions were effective in helping students improve their reading comprehension of a text containing those words, but this effect did not generalize to other texts, such as those found on standardized tests.

Incidental Vocabulary Acquisition via Free Reading

Even if vocabulary instruction can improve reading comprehension, it does not appear to be the main source of word growth for school age children. Nagy and Anderson (1984) observed that "even the most ruthlessly systematic direct vocabulary instruction could [not] account for a significant proportion of all the words the children actually learn" (p. 304). Evidence for the impact of reading on vocabulary acquisition comes from both experimental and correlational studies. In "read-and-test" experiments (discussed further below), subjects are given a text with unknown words in it and asked to read it for comprehension. They are then given a (usually surprise) test on the meanings of the new words. These studies have found that a small but reliable amount of knowledge is gained from even a single exposure to an unknown word (Swanborn & de Glopper, 1999). Nagy, Herman, and Anderson (1985) estimated that with a sufficient amount of reading, a seemingly low "pick-up" rate could account for most of the observed growth in vocabulary knowledge among school-age readers.

Additional experimental evidence comes from sustained silent reading (SSR) and extensive reading studies, in which students are encouraged to read books they select for themselves. These studies have been conducted with children and adults, for both first and second language readers. Krashen's (2004a) narrative review of 54 studies concluded that SSR and extensive reading treatments were as good as or better than traditional language arts and reading instruction in promoting vocabulary and reading comprehension gains. Two meta-analyses of SSR and extensive reading studies have found significant, medium-to-large effects for free reading. Krashen (2007) examined studies for teens and young adults and found a large effect (d= .87) on comprehension tests. Jeon and Day (2016) found medium effect sizes for both vocabulary (d= .47) and comprehension (d= .54) for studies of both adults and children.[1]

Time Efficiency in Instruction

Many vocabulary interventions are aimed at helping low-performing students "catch up" to their age peers in reading, presumably in the most time-efficient way possible. Carlo, August, McLaughlin, Snow, Dressler, Lippman, Lively, and White (2004), for example, argued that "gaining access to the information taught in middle and secondary content area classes requires all students exit elementary school with good reading comprehension," and therefore "closing this gap has a high priority if the U.S. education system is to fulfill its goad of reducing inequalities" (p. 188, 190, emphasis added). Lawrence, Rolland, Branum-Martin, and Snow (2014) claimed that "without proper intervention, lower-skilled students are likely to fall further behind their more skilled peers in academic domains" (p. 77, emphasis added). Faw and Waller (1976) noted that despite the presumed goal of efficiency, most educational intervention studies lack any study or instructional time variable in their analyses. They argued:

> *It is absurd to think that psychologists and educators can be content with improving subjects' learning and retention of textual materials if the altered performance is simply a function of augmented study time. This would be analogous to attributing the increased length of a skier's jump to superior coaching when, in fact, the coach had simply provided a steeper and longer hill from which the jump could be made. (p. 703)*

Faw and Waller proposed that researchers distinguish between absolute performance levels and measures of efficiency. Absolute performance measures look only at the amount of learning that has taken place during the intervention, such as gain scores from pre-test to post-test. An efficiency measure takes these absolute gains and divides them by the study time of the intervention, to yield a gains-per-time estimate. It is then possible to calculate an efficiency index to compare the two approaches by dividing the efficiency score of the experimental group by the efficiency score of the control group. Faw and Waller point out that methods that produce greater absolute gains may in fact be less efficient than the alternatives.

Only handful of studies on vocabulary acquisition have applied the principles laid out by Faw and Waller. Krashen (1989) re-analyzed several vocabulary-teaching studies for word learning efficiency. Several studies by Mason and colleagues also reported the number of words per minute acquired in a second language classrooms in order to compare the efficiency of traditional instruction with comprehension-based language teaching methods (Mason, 2007; Mason & Krashen, 2004; Mason, Vanata, Jander, Borsch, & Krashen, 2008).

Research Questions

My analysis of the relative efficiency of direct instruction and free reading on word knowledge growth is organized around three questions:

1. What is the average efficiency of explicit vocabulary teaching for school-age students as measured in words learned per minute of instruction?

2. What is the average efficiency of free reading in words acquired per minute of reading, based on previous studies of incidental word acquisition rates, the percentage of unknown words in text, and average reading rates for students?

3. What is the relative efficiency of direct instruction compared to free reading, as measured by an efficiency index?

The Efficiency of Direct Instruction

The most recent comprehensive review on vocabulary instruction is Wright and Cervetti (2017), who reviewed the results of 36 studies on the effects of vocabulary instruction on word learning and reading comprehension. They began with the studies selected by two previous meta-analyses of vocabulary teaching interventions (Elleman et al., 2009; Stahl & Fairbanks, 1986), supplementing their pool of studies with those published after the Ellman et al. review. Their inclusion criteria differed somewhat from previous reviews. To be selected for the review, studies had to include PreK-12 students, a treatment involving the direct instruction of words, the teaching of "word-solving" strategies, or both, and a passage comprehension dependent measure.

Their analysis reported estimates of the time spent on vocabulary instruction in each study. These instructional times, however, are for the amount of time devoted to each word taught. For an efficiency measure, we need the time spent per word learned (Faw & Waller, 1976). In this analysis, I took the number of words learned in the intervention divided by the total instructional time (in minutes) of the vocabulary instruction, similar to Krashen (1989) and Mason (2007). For example, if 100 minutes were spent on instruction, and the gain score for vocabulary was 5 words, the efficiency estimate would be .05 words per minute (wpm) (5 words/100 minutes). An efficiency score is calculated for each study.

Gain scores for studies without comparison or control groups were calculated by subtracting the pre-test vocabulary scores from the post-test scores. Studies that had a control group but no information on whether the controls also received vocabulary instruction ("business-as-usual" or "typical practice" groups) were treated the same as those with no control groups. If a study had a reading-only comparison group, the gain scores of the comparison group were subtracted from gain scores of the treatment group, resulting in a "net" gain estimate.

Study Selection

Of the 36 studies included in the Wright and Cervetti review, nine studies included interventions aimed at teaching word learning strategies only, not a specific set of target words. Of the remaining group of 27 studies, I excluded 13 studies that failed to meet one of the following four criteria: (a) included a measure of target word knowledge due to the intervention; (b) included a pre-test or a no-treatment comparison group to control for pre-treatment knowledge of the target words; (c) provided sufficient data on instructional time to calculate efficiency; and/or (d) included subjects who would likely be able to read independently (grade 2 or older). This left 14 studies with sufficient data to calculate an efficiency estimate, listed in Tables 1 and 2.[2]

In cases where there was more than one experimental group and significant differences were found among them, the explicit instruction group that had the highest vocabulary gain scores was used in the calculations in order to provide the "best-case scenario" for explicit instruction. When there were multiple treatments and no significant differences found in their gain scores, I took the average gain for all the experimental conditions. Wright and Cervetti categorized the studies by the length of the intervention, with a "brief" intervention lasting four weeks or less, and a "long-term" intervention lasting more than four weeks (p. 209). Table 1 summarizes the data used to calculate time efficiency from the nine brief interventions. The data from the five long-term studies are found in Table 2.

Time Estimates

I used the "per word" instructional times provided by Wright and Cervetti (2017) in six of the 14 studies, taken from their Tables 2 and 4 (pp. 9, 15). For the other eight experiments, I used a different estimate, justified below. In all cases, my revised estimates were lower than those given by Wright and Cervetti. Total words learned was calculated by multiplying the raw score increase, pre- to post-test, by the quotient of total words divided by total words tested. For example, in Leseaux et al. (2010), there were 72 words taught but only 36 words tested. The raw score was multiplied by two (72/36) to yield the total words gained.
Bos & Anders (1990). Bos and Anders report that each intervention consisted of six 50-minute sessions over a period of seven weeks: three "practice" sessions and three experimental sections. Although Wright and Cervetti (2017) count both the practice and the experimental sessions for their time estimates, I have used only the experimental ones, for a total of 110 minutes of instruction across the three days.

Greene Brabham and Lynch-Brown (2002). Wright and Cervetti (2017) provided an estimate of 180 minutes for the experimental treatments (4.5 minutes per word taught for the 40 words). Greene Brabham and Lynch-Brown reported that the highest scoring group, the interactive group, spent 25 minutes on each of two stories. Since the stories were read three times, I used an estimate of 150 minutes of instruction. I excluded their first-grade subjects since it wasn't clear they were able to read independently.

Hawkins, Musti-Rao, Hale, McGuire, and Hailley (2010). Hawkins and colleagues studied vocabulary acquisition using a within-subjects, post-test-only design with a group of fourth-grade students. The reading-only condition read three 400-word stories. Since no treatment time was reported for this condition, I began with the average 4th grade silent reading rate, which is estimated to be around 150 wpm (Carver, 1989; Spichtig, Hiebert, Vorstius, C., Pascoe, J., Pearson, P. D., & Radach, R., 2016). However, because students knew they were going to be quizzed on the content of the passages, I lowered the reading rate to 100 wpm, as students who know they are to be tested tend to read more slowly (Carver, 1990). I estimated four minutes was spent by the controls on reading the story (400 words/100 wpm).

The listening + vocabulary instruction condition produced the greatest absolute number of words gained. For the listening part of the treatment, I doubled the estimate of the reading-only condition (8 minutes), since students were asked to repeat each sentence after it was read by the teacher. For the added pre-reading vocabulary instruction, I estimated one minute per target word, which is what Coyne et al. (2009) used as a time estimate for giving word definitions in storybook reading treatments. Thus the total listening + vocabulary practice treatment time was 18 minutes (10 minutes instruction plus 8 minutes reading and repeating). Wright and Cervetti's estimate was "less than one minute" on each of the 30 target words.

Pany, Jenkins, and Schreck (1982) (Study 1). Only a range of per-word instructional times (two to ten minutes) was provided by Wright and Cervetti. Students saw two sets of target words in each condition. The highest scoring condition was "meanings practiced," which spent 6.5 minutes per set of words, for a total of 13 minutes.

Seifert and Espin (2012). Wright and Cervetti estimated that the researchers spent 12 minutes on each target word taught, for a total of 120 minutes. But it would appear from the procedures section of the study (p. 241) that students spent 30 minutes in each condition for each set of 10 target words, so the total time by condition was 30 minutes, not 120.

Tuinman and Brady (1974). Wright and Cervetti estimated 10 minutes per word taught (for 660 minutes), although the time reported for the treatment by the researchers was 585 minutes (14 instructional sessions of 45 minutes each, p. 179), so this lower estimate was used.

Beck, Perfetti, & McKeown (1982); McKeown, Beck, Omanson, and Perfetti (1983). An estimate of 15 minutes per word was given by Wright and Cervetti for both of these studies, for a total of 2,288 minutes for 104 target words. I used a slightly lower estimate of 2,250 minutes based upon Beck et al. description's of the intervention as consisting of 75 30-minute lessons.

Summary of Direct Instruction Studies

Tables 1 and 2 summarize the efficiency scores in words learned per minute for the 14 direct instruction studies taken from Wright and Cervetti's (2017) review. Also listed are the grade level, sample size, treatment duration (in minutes), number of words learned, and type of vocabulary test (meaning recall or meaning recognition) for each experiment. For short interventions, the average number of words learned per minute was .07. For long-term interventions, the average number of words gained per minute was much smaller, at .01. There was a large standard deviation for the short-term studies, indicating considerable variability in efficiency scores.

Incidental Word Acquisition from Reading

Several studies of K-12 and adult readers have measured the amount of vocabulary gained incidentally from reading. As noted above, in these "read-and-test" experimental studies, subjects are given texts containing unknown words and told to read the texts for comprehension. They are then given a surprise vocabulary test on the unknown words, either immediately or after some delay. We can use these data to estimate the number of unknown words a typical reader might acquire through reading for pleasure, given a certain percentage of unknown words in the text. Combined with data on reading rate, we can then estimate the number of words per minute that could have been gained through free reading for each of the 14 direct instruction studies.

Table 1. *Efficiency of Direct Instruction of Vocabulary in Long-Term Interventions*

Study	Grade Level (Sample Size)	Duration	Words Learned (Test Type)	Efficiency Score
Bos & Anders (1990)	7, 8 (*N*= 61)	110 minutes	7.86 (Recog.)	.07 wpm
Greene Brabham & Lynch-Brown (2002) (Grade 3)	3 (*N*= 129)	150 minutes	11.9 (Recog.)	.08 wpm
Hawkins et al. (2010)	4 (*N*= 21)	18 minutes	2.67 (Recall)	.15 wpm
McKeown et al. (1985)	4 (*N*= ?)	360 minutes	13.17 (Recog.)	.04 wpm
Nash & Snowling (2006)	2, 3 (*N*= 24)	360 minutes	5.14 (Recog.)	.014 wpm
Pany et al. (1982) (Study 1)	4 (*N*= 12	13 minutes	0.92 (Recall)	.07 wpm
Seifert & Espin (2012)	10 (*N*= 20)	30 minutes	3.1 (Recog.)	.10 wpm
Stahl (1983)	5 (*N*= 28)	75 minutes	8.32 (Recall)	.05 wpm
Tuinman & Brady (1974)	4, 5, 6 (*N*= 210)	585 minutes	12.18 (Recog.)	.02 wpm
Average				.07 wpm
(Std Dev)				(.04)

Recog.= Meaning recognition test.

Table 2. *Efficiency of Direct Instruction of Vocabulary in Long-Term Interventions*

Study	Grade Level (Sample Size)	Duration	Words Learned (Test Type)	Efficiency Score
Beck et al. (1982)	4 (*N*= 27)	2250 minutes	52.75 (Recog.)	.02 wpm
Lesaux et al. (2010)	6 (*N*= 476)	3240 minutes	12.08 (Recog.)	.004 wpm
Lesaux et al. (2014)	6 (*N*= 2082)	4095 minutes	9.62 (Recog.)	.002 wpm
McKeown et al. (1983)	4 (*N*= 82)	2250 minutes	48.59 (Recog.)	.02 wpm
Simmons et al. (2010)	4 (*N*= 903)	1620 minutes	21.98 (Recog.)	.01 wpm
Average				.01 wpm
(Std Dev)				(.009)

Recog.= Meaning recognition test.

I have included in Table 3 the studies from Swanborn and de Glopper's (1999) meta-analysis on incidental word acquisition among school-age readers. I excluded four unpublished dissertations used by Swanborn and de Glopper, but added one published study not in their review (Herman, Anderson, Pearson, & Nagy, 1997). I also excluded studies in which the researchers deliberately choose or manipulated the contexts around the target words in order to make them all either "informative" or "uninformative," since neither extreme is representative of natural texts. Only studies in which words were chosen solely on the basis of whether they were likely to be unknown to the reader regardless of context were used.

The studies include readers at every reading ability level, including less-able readers.3 I report the results by reading achievement level for those studies that provided a breakdown, taken in part from Swanborn and de Glopper's meta-analysis (Table 3, p. 273).4 Table 3 lists grade levels tested, the number of subjects, and the subjects' reading levels for each study. The final column of Table 3 reports the probability of acquiring an unknown word from a single exposure. Nagy et al. (1985) defines this probability as "the increase in the number of words divided by the number of words originally not known" (p. 248). In some studies, students were tested on both the target words that appeared in their assigned text and on words that appeared in a text they did not read. This was done instead of a pretest to control for prior knowledge of the target words. For these studies, I used Nagy et al.'s (1987) formula to calculate probability:

(Proportion of Target Words Correct – Proportion of Control Words Correct) / (1 - Proportion of Control Words Correct)

In those studies where a pretest was used instead of control words, I followed a similar formula, subtracting the proportion of correct pretest words from the proportion of correct post-test words, and then dividing that result by the proportion of incorrect pretest words.

Table 3. *Incidental Acquisition Pickup Rates in 12 Studies*

Study	Grade Level (Sample Size)	Subjects' Reading Level[a]	Acquisition Probability
Herman, Anderson, Pearson, & Nagy (1987) (81st to 99th Percentile)	8 (*N*= 413)	H	0.26
Herman, Anderson, Pearson, & Nagy (1987) (31st to 80th Percentile)	8	A	0.12
Herman, Anderson, Pearson, & Nagy (1987) (3rd to 30th Percentile)	8	L	0.05
Nagy, Anderson, & Herman (1987)	3, 5, 7 (*N*= 352)	H, A, L	0.05
Nagy, Herman, & Anderson (1985)	8 (*N*= 57)	H, A	0.11
Schwanenflugel, Stahl, & McFalls (1997)	4 (*N*= 43)	H, A, L	0.08
Stahl (1989)	6 (*N*= 182)	H, A, L	0.13
Shu, Anderson, & Zhang (1995) (English experiment)	3, 5 (*N*= 170)	H, A, L	0.10

[a] Subjects' Reading Level: H = High, A = Average, L = Low, taken in part from Swanborn & de Glopper (1999). Scores from both meaning recall and meaning recognition measures were averaged to calculate probability if data on both were provided.

The probability of acquiring an unknown word incidentally through reading ranged from .05 to .26. In their meta-analysis, Swanborn and de Glopper (1999) calculated the average probability of acquisition to be .15 for the 15 experiments

they included. The average probability of acquisition for the eight experiments in Table 3 is slightly lower, at .11. What is the appropriate acquisition rate for comparing free reading to direct instruction? Since the goal of direct instruction is often to help low-achieving students, the most conservative approach is to use one of the lower estimates. In Table 3, we find that the lowest probability estimate is .05. This is the figure used for the efficiency scores calculations below

Percentage of Unknown Words in Text

The number of words that a reader can acquire incidentally from reading depends in part on how many unknown words are present in the text. Anderson and Freebody (unpublished, reported in Nagy et al., 1985) estimated the number of unknown words likely to be encountered by a "50th percentile fifth-grader" in text is between three and six percent, depending on the criteria used for "knowing" a word (p. 250). The researchers did not specify the source of the texts analyzed. Stahl (1990) stated that "a reader typically encounters between one and a half and three unknown words per hundred running words" (p. 6), but he gave no source for his estimate.

Carver's (1994) attempted to determine the percentage of unknown words by asking third through sixth grade students to circle words they did not know in a set of passages. Students first were tested to determine their current reading level, and then given passages to read that were below, at, or above their grade level. Passages were taken from both textbooks and library or trade books (p. 416). Carver noted that all of the percentages are likely to be underestimates, however. A large number (40%) of his initial sample failed to underline three embedded low-frequency words and had to be excluded from the study, suggesting that students had a tendency to under-identify unknown words in the texts.

Since Carver's (1994) estimates are the best documented, I have used for my calculations the average number of unknown words he found for library books, from two grade levels above grade level (3.35%), at grade level (1.30%), and two grade levels below reading level (1.35%), giving us an estimate of 2%. This number falls at the lower end of the range given by Stahl (1990), and slightly below the low end of Anderson and Freebody's (cited in Nagy et al., 1985) results.

Reading Rates

Efficiency calculations for incidental vocabulary acquisition depend in part on the reader's reading rate. The most recent large-scale study of reading rates was a partial replication of Taylor (1965) by Spichtig et al. (2016). Like Taylor, Spichtig and colleagues measured reading rate along with comprehension and eye movements for a large sample (*N*= 2,203) of students, but limited their study to grades 2, 4, 5, 8, 10, and 12. Unlike Taylor's study, the researchers attempted to stratify their sample to reflect the current demographics of U.S. schools, but it was not a random sample.

Table 4 (column 2) lists the mean reading rates, controlling for comprehension, reported in Spichtig et al. The researchers also reported rates by quartile, so I have taken the average of the bottom two quartiles in order to provide an approximate "below average" or "slow" reading rate at each level (column 3). Since again vocabulary instruction is often advocated especially for less-able readers, I will use these lower rates in making efficiency estimates when comparing acquisition rates to direct instruction studies in the following section, even when it appears the actual subjects in the study were average or above average readers.

Free Reading Efficiency Scores

Having established a rate of acquisition (.05), a percentage of unknown words typically found in text (2%), and average and low-achieving reading rates for school-age children, we can now estimate the number of unknown words that would likely be acquired from free reading. Table 4 (columns 4 and 5) reports estimates, at various reading rates, of the number of words per minute likely to be acquired from reading under these assumptions

Table 4. *Estimated Incidental Word Acquisition from Free Reading at Average and Slow Reading Rates*

Grade Level	Average Reading Rate (*SD*)	Slow Reading Rate	Efficiency: Average Rate	Efficiency: Slow Rate
2	116.1 (41.7)	87	.12 wpm	.09 wpm
4	147.8 (45.4)	115	.15 wpm	.12 wpm
6	164.2 (54.4)	128	.16 wpm	.13 wpm
8	169.9 (51.8)	130	.17 wpm	.13 wpm
10	186.6 (53.4)	147	.19 wpm	.15 wpm
12	187.5 (55.5)	181	.19 wpm	.18 wpm

Measured in words per minute of reading, students become more efficient in word acquisition as they age, although the trend is not perfectly linear due to the plateauing of reading rates between grades 4 and 8. Students reading at an average rate for their grade level will acquire around .12 words per minute in grade 2, rising to .19 words per minute by grade 10. For low-achieving students, the efficiency of incidental acquisition goes from .09 words per minute at grade 2, up to .18 words per minute in grade 12.

Efficiency Indexes for Direct Instruction and Free Reading

Having calculated the efficiency scores for both direct instruction and free reading, we can now provide efficiency indexes to compare the two approaches for each of the direct instruction studies. Table 5 shows the efficiency scores estimates of direct instruction conditions and our hypothetical reading-only conditions. I took the estimated number of words gained and words per minute for each study in Cervetti and Wright (2017) as reported in Tables 1 and 2 above. For the incidental acquisition estimates, I used the "slow" reading speed for that grade level as found in Table 5. For studies that included odd-numbered grades, I used the estimate from the even-numbered grade below it (e.g. for grade 5, grade 4 reading speeds were used.). Shown also in Table 5 is the estimated number of words one could acquire from reading (an absolute measure), to compare to those gained in the direct instruction experiment (Table 5, column 4, "Reading Words Gained").

As was done in Faw and Waller (1996), the efficiency index for a study was calculated by dividing the efficiency score of experimental condition (direct instruction) by the efficiency score of the control condition (reading-only). An efficiency index score of 1.0 means the two approaches were equally efficient, a number smaller than 1.0 indicates incidental acquisition was more efficient, and a number

Table 5. *Efficiency of Direct Instruction versus Incidental Acquisition in 14 Studies*

Study	Duration	DI Words Gained[a]	Reading Words Gained	DI Efficiency Score	Reading Efficiency Score	Eff. Index[b]
Short-Term Studies:						
Bos & Anders (1990)	110	7.86	14.3	.07 wpm	.13 wpm	0.54
Greene Brabham & Lynch-Brown (2002)	150	11.9	13.5	.08 wpm	.09 wpm	0.89
Hawkins et al. (2010)	18	2.67	2.16	.15 wpm	.12 wpm	1.25
McKeown et al. (1985)	360	13.17	43.2	.04 wpm	.12 wpm	0.33
Nash & Snowling (2006)	360	5.14	32.4	.01 wpm	.09 wpm	0.16
Pany et al. (1982) (Study 1)	13	1.42	1.56	.07 wpm	.12 wpm	0.58
Seifert & Espin (2012)	30	3.1	4.5	.10 wpm	.15 wpm	0.67
Stahl (1983)	75	8.32	9	.05 wpm	.12 wpm	0.42
Tuinman & Brady (1974)	585	12.18	70.2	.02 wpm	.12 wpm	0.17
Average (SD)				.07 wpm (.04)	.12 wpm (.019)	0.56 (.35)
Long-Term Studies:						
Beck et al. (1982)	2250	52.75	270	.02 wpm	.12 wpm	0.17
Lesaux et al. (2010)	3240	12.08	421.2	.004 wpm	.13 wpm	0.03
Lesaux et al. (2014)	4095	9.62	573.3	.002 wpm	.14 wpm	0.01
McKeown et al. (1983)	2250	48.59	270	.02 wpm	.12 wpm	0.17
Simmons et al. (2010)	1620	21.98	145.8	.01 wpm	.09 wpm	0.11
Average (Standard Deviation)				.01 wpm (.009)	.12 wpm (.019)	0.10 (.08)

[a] DI = direct instruction. [b] Eff. Index = efficiency index.

greater than 1.0 means direct instruction was more efficient. Results are reported in Table 5, as in Tables 1 and 2 above, by Wright and Cervetti's classification of "short-term" and "long-term" treatments.

Short-term direct instruction studies had an average rate of word learning of .07 wpm. The average rate of word acquisition for free reading was .12 wpm, resulting in an average efficiency index of .56, favorable to free reading. This difference is statistically significant ($t(16)= 3.36$, $p< .01$), yielding a large effect size ($d= 1.58$). Put another way, reading would be on average 1.7 times (.12 wpm/.07 wpm) more efficient than direct instruction in word acquisition. Direct instruction was found more efficient than reading in only one of the nine short-term comparisons.

For long-term studies, the results favor incidental acquisition to an even greater degree. The average efficiency of long-term direct instruction treatments was .01 wpm, compared to .12 wpm for incidental acquisition, and the average efficiency index was .10. As with the short-terms studies, this difference is statistically significant ($t(8)= 11.83$, $p< .0001$), with a very large effect size ($d= 7.48$). This means free reading would be about 12 times (.12 wpm/.01 wpm) more efficient than direct instruction in helping children acquire new vocabulary in long-term treatments.

There was a moderate negative correlation between the time devoted to instruction and the efficiency estimate ($r= -.67$, $p<.01$), meaning that the more time teachers spent on vocabulary instruction, the fewer number of words per minute their students learned.

Discussion

Our results indicate that neither short-term nor long-term instruction is efficient in teaching new words compared to just reading. Students in short-term direct instruction treatments learned about four words per hour (.07 wpm), compared to our estimate of around seven words per hour (.12 wpm) via free reading. For long-term treatments, students learn only about a .5 words per hour of instruction (.01 wpm).

Greater investments of time into vocabulary instruction appear to have diminishing returns in terms of the number of words students learn. It is clear from the estimates in Table 5 that long-term interventions were considerably less efficient than short-term ones. The least efficient instruction was found in those studies (Leseaux et al., 2010; 2014) that focused on teaching words from the Academic Word List. Students learned only one new AWL word every five and a half hours or so of instruction. At this rate, students would need to spend roughly 1,600 hours of instruction to learn just half of the 570 AWL terms, a feat that would take a decade or more of language arts classes devoted to nothing but vocabulary teaching.

Some Objections

Hypothetical Comparison Groups. Since nearly all of the direct instruction studies we examined lacked a reading-only condition, we do not have a set of "head-to-head" comparisons of incidental acquisition versus direct instruction. But there is no reason to think the subjects in the studies reviewed here, had they been given the opportunity to read, would not also have acquired vocabulary at rates found in previous incidental acquisition studies. Confidence in our findings is bolstered by the results of two reviews of studies that did include direct comparisons between a reading-only and a reading plus explicit instruction condition. McQuillan (2016a) reviewed eight such experiments with adult second-language acquirers, and found that reading-only conditions had the same or greater efficiency than direct instruction in six experiments, and lower efficiency in two treatments. McQuillan (2019) looked at five studies that compared direct instruction and reading-only conditions in storybook reading for young children. The reading-only conditions were found on average to be 66% more efficient than direct instruction conditions for acquiring new words.

Overly Optimistic Estimates. While I have used conservative estimates consistent with previous studies of incidental acquisition rates, percentage of unknown words, and reading

rate, some might argue they should be even lower. To provide an even stricter test for my assumptions, I ran a separate analysis of the efficiency data in Table 5 in which I halved the incidental reading acquisition efficiency estimates in all the comparisons, the equivalent of lowering the estimate of unknown words in a text to 1% or the probability of acquisition to .025. Even under these very pessimistic assumptions for incidental acquisition, free reading was still significantly more efficient than direct instruction for the long-term studies ($t(8)= 8.61$, $p< .0001$). For the short-term studies, the revised average efficiency estimate for free reading was .06 wpm, which was not significantly different from the direct instruction estimate of .07 wpm ($t(16)= 0.46$, $p= .665$). Free reading, then, was as good as or better than direct instruction in promoting word growth regardless of the study length.

In any such "tie" between free reading and direct instruction, the advantage clearly belongs to free reading, since reading is less work for the teacher and more enjoyable for the student. In addition, free reading has important benefits in addition to vocabulary, such as improving reading comprehension, writing, and grammar (Krashen, 2004a). Nagy et al. (1985) also make this point, noting that "[a]ny comparison of approaches ought to take account of the fact that time spent in reading has more benefits than just growth in vocabulary...no doubt the ancillary benefits of vocabulary instruction are less rich" (p. 251).

An argument can be made that the probability estimates such as those provided by the read-and-test studies should not be applied in the way done in this analysis. Our analysis assumes that acquisition is incremental, meaning that we pick up a small percentage of an unknown word's meaning each time we see it in a text. As Stephen Krashen (personal communication) has pointed out to me, read-and-test researchers such as Nagy et al. (1985) seem to assume that a .05 probability means that out of 100 unknown words in a text, a reader acquires the full meaning of five of them. This is not the same as saying that you pick up partial meanings (say, 5%) of 100 words. If the former interpretation accurately represents these researchers' reasoning, then multiplying a probability by the number of word occurrences may in fact be inappropriate and overestimate vocabulary gains.

Still, our finding that free reading is superior to direct instruction for word acquisition is consistent with analyses that used a very different approach to the problem, that of corpus analysis. Nation (2014), for example, looked at a large corpus of classic novels to determine how much one would have to read to have a reasonable chance of acquiring new words. Potentially unknown words that occurred 12 or more times in the text were considered "acquired" in Nation's study. For texts written with 98% vocabulary coverage in the 3,000- through 8,000-word-family levels (the levels at which popular, young adult fiction is written (McQuillan, 2016b)), Nation estimated that on average 6.9 words would be acquired per hour, or 0.12 wpm. This is identical to our overall incidental acquisition estimate for school-age readers. Similarly, McQuillan (in press) examined a corpus of 1.2 million words from young adult popular fiction and, using a similar "cut-off" method as used by Nation, found that reading was between two and six times more efficient than direct instruction in acquiring academic vocabulary.5

Short-Term Benefits of Instruction. Since Wright and Cervetti (2017) concluded that "pre-teaching" vocabulary appears in a text improves comprehension of that text, it could be argued that direct instruction interventions have real benefits when used in this short-term, "text-by-text" approach. The weakness of this argument is that such teaching is by definition only a temporary fix, akin to bailing out a sinking boat with a bucket instead of fixing the hole at the bottom. Stahl (1990) made a similar observation, noting that "[m]ore intensive instruction is going to take away time from other activities, including wide reading that will not only better allow them to solidify their vocabulary gains but also will itself lead to greater vocabulary growth" (p. 11). Allington, McCuiston, and Billen (2015) argued that students need to read texts they can understand independently for real progress in reading to occur, preferably on topics that are compelling and comprehensible to them (Krashen et al., 2018). One solution, proposed by Krashen (2004a) and others, is to give students the opportunity to read extensively by providing a large number of interesting and comprehensible books in the school and classroom library, time to read daily, and a comfortable environment. Such programs have been found to be as good as or better than traditional instruction in promoting both vocabulary growth and reading comprehension (Krashen, 2004a; Krashen & Mason, 2017).

Free Reading as a Bridge to Academic English

I do not claim that free reading alone can give students 100% of the vocabulary or academic language needed for success in school. Some explicit teaching of terms related to new concepts, for example, may be required. More importantly, there are characteristics of academic language that are only found in academic texts (Biber, 1985), and therefore can only be acquired through academic reading (Krashen, 2010). Pleasure reading can, however, provide an important "bridge" to more challenging school reading, including sub-technical vocabulary. Rolls and Rogers (2017) analyzed a large corpus of science fiction and fantasy literature for the presence of sub-technical vocabulary specific to the sciences, based on Coxhead and Hirsh's (2007) list of 318 word families (e.g. degrade, module, uptake). They found that nearly all of the words (92%) occurred at least once in a corpus of one million words, and majority of those words occurred six times of more, giving students a good chance to acquire them.

Krashen (2012a; 2012b) advocates a two-stage approach for helping students advance in both academic vocabulary and content knowledge via free reading. Stage 1 consists of "massive, but not necessarily wide, self-selected voluntary reading" (Krashen, 2012b, p. 9). Reading done at this stage builds general vocabulary and knowledge of the world that will make academic reading more comprehensible. Ideally, students read narrowly in order to take advantage of prior knowledge of a topic or book series (Krashen, 2004b; Kyungho & Nation, 1989; Schmitt & Carter, 2000).

Since general reading will not give students all of the academic language they need, Krashen proposes a second stage called narrow academic reading. This consists of students reading about an academic topic that they themselves are interested in. This sort of reading will give students knowledge of academic conventions and language (such as the words on the AWL) that in turn will help them across disciplines. Krashen (2012b) gives his own case history of narrow reading in linguistics and medicine that gave him sufficient knowledge of the academic language register to read scholarship in other fields. Indeed, it would seem that nearly all of us acquired academic language in this way, and not through direct instruction (Krashen, 2012a). Providing low-achieving students with an opportunity to follow that same path should at least be considered.

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Notes

1. The National Reading Panel (2000) concluded that SSR and extensive reading programs do not help students become better readers, but as Krashen (2001, 2005) pointed out, the Panel omitted several studies of silent reading programs in its review, and misreported the results of some of those they did examine. Lewis and Samuels (2005, reported in Allington, 2014) conducted a review of 49 SSR studies, and reached a similar conclusion to Krashen's (2004a): "No study reported significant negative results; in no instance did allowing students time for independent reading result in a decrease in reading achievement" (p. 17). The eight "true experiment" studies Lewis and Samuels included in a meta-analysis had an effect size favoring free reading (*d*= .42).

2. Apthorp et al. (2012) included a comparison group that received a different, less intensive form of vocabulary instruction. No raw post-test scores on the target words were reported, only the hierarchical linear modeling results (Table 7, p. 174). Apthorp et al. claimed that the significant effects of the intervention held even when taking into account instructional time (p. 173), but this merely indicates that the experimental form of direct instruction was more efficient than the comparison form of vocabulary teaching. No reading-only comparison group was used.

3. I was unable to locate a read-and-test study of incidental acquisition among second language or language minority K-12 students. However, studies of adult L2 vocabulary acquisition have reported similar probability of acquisition estimates as those found in Table 3, ranging from .05 (Zahar, Cobb, & Spada, 2001) to .17 (Pellicer-Sanchez & Schmitt, 2010).

4. Two studies (Nagy, Anderson, & Herman, 1987; Shu, Anderson, & Zhang, 1995) also reported acquisition rates by the "conceptual difficulty" of the target word. The highest difficulty rating ("Level 4") was given to words that required new factual information to be understood. Nagy et al. found that none of the Level 4 words in the passages read by the students in their study were acquired, while Shu et al. found with a similar group of subjects that the probability of acquisition for such words was .07, within the low-end of the range of probabilities reported in Table 3. Nagy et al.'s Level 4 words appear in part to be technical vocabulary, words specific to a given discipline (e.g. divide meaning "boundary between drainage systems" (Nagy et al., 1987, p. 250). These are not the type of words generally included in vocabulary teaching programs such as those reviewed by Wright and Cervetti (2017), most of which used "Tier 2" or sub-technical words.

In Herman et al.'s (1987) study, nearly half of the target words could be classified as conceptually difficult or requiring new factual information to understand, terms such as renal, floodplain, ventricle, oxbow lake, and aorta. Yet the probability of acquisition in Herman et al. (.10) was comparable to the results from Stahl (1989) (.13), which used only "difficult synonyms" for the target words. This is additional reason to suspect that Nagy et al.'s (1987) finding may be an outlier.

5. There is an obvious problem with determining the rates of incidental acquisition during self-selected reading conditions: how do you assess word gains when every subject is reading a different text? Cho and Krashen (1994) attempted in part to do this in their study of a group of adult second language subjects (N = 4). Each of their subjects read texts of her own choosing. Three of the subjects also underlined words they did not know. A fourth subject, Alma, was not part of the original reading study group, and did not underline any words while reading. She instead was given a pretest and post-test on 165 words that the other three subjects had consistently marked as unknown from the reading series all four subjects were using.

Alma was not aware she was going to participate in the reading study when she took the pretest, so there is little chance she would have attempted to study or memorize the words. Applying the formula from Nagy et al. (1987) used above to the data reported by Cho and Krashen (1994, Table 3), we find Alma's rate of acquisition was an impressive .56. Alma reported she did not use a dictionary at all during her reading. These results suggest that self-selected reading may yield much higher rates of acquisition than in the laboratory conditions typically used in other studies, where the texts are chosen by the researchers.

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The Effect of Intercultural Education on the Ethnocentrism Levels of Prospective Teachers*

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Abstract

In this study; the effects on the ethnocentrism levels of prospective teachers have been examined upon providing education under the scope of intercultural education. The study has been designed as a quasi-experimental design with pre-test, final-test control group. The study took place during the spring semester of 2014-2015 academic year. The study group consists of a total of 118 prospective teachers, 74 of whom (trial group) are students at a public university in Ankara and 44 (control group) from a public university in Niğde. At the beginning and end of the study, the ethnocentrism levels of the prospective teachers have been assessed. The 20-item Ethnocentrism Scale has been used as the data collection tool. In order to interpret the points scored in "Ethnocentrism Scale", an independent sample t-test and "One-Way Covariance" analysis have been used. The research findings indicated a positive oriented change in the ethnocentrism points and between both the trial and control group students' pre- and final test grade averages in the in-group comparisons. However, this positive change was in favour of the trial group in the inter-group comparisons. In other words, the project assignment made by the prospective teachers had a positive impact on the students' ethnocentrism levels.

Keywords: Intercultural Education, Ethnocentrism, Teacher Training, Visual Arts Education

Introduction

As in all parts of life, cultural and social alteration has become one of the important societal factors in uncovering new opinions and ideas in the field of education. Intercultural education has become one of the prominent issues in the field of education as a result of this alteration. As well as the historic and political issues, migration at different levels around the world are among the main factors that are making intercultural education a prominent issue. Common living points have been established as individuals with different habits, cultures and social structures need to live and work together (Banks, 2013; Bennett, 2009; Bleszynska, 2008; Gay, 2014). Furthermore, transformation through technology and knowledge lead to an intense communication everywhere from education to business sector (Kartarı, 2001). At this point, intercultural education has maintained its position within national and international levels. According to Bleszynska (2008), intercultural education is the result of educational and social processes in multicultural societies existing in a globalizing world. This outcome is being expressed in three dimensions:

- Social-Global: The variance of civilization and cultures at a global level and the respect towards this variation, solidarity, and the ability to live peacefully with different cultures, being aware of national and international migration,

- Social-National: Existence of cultural differences and varieties, combatting inequalities that are caused by differences, preventing intercultural disputes,

- Social-Individual: Developing the ability to live in harmony with cultural differences at an individual level, dealing with obstructions such as ethnocentrism, prejudice or xenophobia that limit intercultural relations. Developing intercultural competencies at an individual level. In line with these purposes, Bleszynska (2008) describes the education provided in official or unofficial (common) educational environments under the scope of intercultural education for individuals and societies, social and professional groups, adults, children and teenagers, whether they are migrants or hosts.

Intercultural education is a type of education that includes an interdisciplinary approach aiming to minimize or prevent possible tensions, biases, privileges or stereotyped thoughts that can occur between societies and individuals due to cultural differences. It tries to ensure full and effective participation in life of individuals, whether individually or as part of the society, by developing awareness towards different cultures is one of the aims of intercultural education (Chiriac & Panciuc, 2015; Perry & Southwell, 2011; Kartarı, 2001; Üstün, 2011). Intercultural education covers subjects such as examining, learning and understanding different cultures and creating intercultural communication environments. (Kaya & Aydın, 2014; Tay & Baş, 2015). Beyond a passive social life, the targets of intercultural education include creating, developing and sustaining means of social understanding and communication that contains different cultures and dialogue and respect between these different cultures (Holm & Zilliacus, 2009). According to Chiriac & Panciue (2015), intercultural education is a type of education that expresses interaction between people that possess different ideas and perspectives, religion, language and culture. Essentially, this type of education (such as principles, values, traditions) is also expressing cultural differences and (such as gender, social and economic structure) other differences. Intercultural education assumes the role of social meditation by increasing the productivity of intercultural communication and ensuring tolerance and acceptance between different individuals and societies. Intercultural education aims to provide equal education for each individual in the society in order to en-

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sure their active and complete participation in life through their cultural knowledge, attitude and capabilities (UNESCO, 2006). Many areas, subjects and concepts that comprise the structure of intercultural education help to create studies based on interdisciplinary approach, hence it becomes possible to form educational environments decorated with cultural values (Hofstede, 2001; Kırışoğlu, 2009; Portera, 2008; Tertemiz & Aslantaş, 2016).

With regards to the formal aspect of intercultural education, Sikorskaya (2017) believes that class programs must be prepared by taking into consideration the teacher's intercultural competency, level of expertise regarding intercultural education, knowledge, level of class receiving the intercultural education and by performing activities in and outside the class. As stressed by Bennett (2009), the need for intercultural competency required for the application of intercultural education is not applicable only for the teachers serving at primary and secondary level institutions but rather it is important for all levels of education including university. On the other hand, looking from a wider perspective, intercultural education refers to the education of all individuals, including all age groups and levels such as young-old, migrant-host, starting from birth and continuing throughout an individual's life (Bleszynska, 2008).

Ethnocentrism

One of the most important problems affecting communication between individuals, cultures or societies is ethnocentrism (UNESCO, 2008; Üstün, 2011). Defined as the attachment to an ethnical group, the concpt of ethnocentrism is a subjective emotion or attitude where an individual or a group places his/their culture at the centre and interpret the different cultures with their own culture's values (Booth, 2017; De Dreu et al., 2010; Etinson, 2017; Hofstede, 2001; Soydaş Uzunçarşılı, 2010). Ethnocentrism is a behaviour and attitude syndrome that is experienced almost at a universal level and hindering communication between individuals or groups (Hammond & Axelrod, 2006; Miu, 2016). "The concept of ethnocentrism, one of the most important obstacles of a successful communication at individual and social level, consists of two components. One of them is an individual deeming his own culture as natural, and the other is an individual believing in the superiority of his own culture" (Üstün, 2011, p. 26). Booth (2017, p. 14-15) describes ethnocentrism in three ways. "As a term to describe feelings of group centrality and superiority, As a technical term to describe a faculty methodology in the social sciences, As a synonym for being culture-bound." Individuals may consider cultural behaviours, attitudes, eating habits and clothing that do not conform to their own cultural norms as abnormal, invaluable and even immoral. Such an approach contains subjective behaviours and attitudes that are full of common stereotypes and biases and greatly harm intercultural communication at an individual or social scale (Chalmers, 1996; Güvenç, 2016; Kartarı, 2001; Sargut, 2001; Tekinalp, 2005; Üstün, 2011; Zekiyan, 2015). Just as it is not possible to say one culture is right or better than another, it is also not possible to say a culture is bad or wrong. Some values that are welcomed in a community may not be welcomed in another community. But this cannot mean that certain values are wrong or right (Kırışoğlu, 2009; Ügeöz, 2003; Üstün, 2011). As expressed by De Dreu et al., (2010) and Üstün (2011) the style and level of reflection of ethnocentrism on life is important and in some cases it can help an individual to feel like being a part of a group and develop a positive attachment towards the group, as well as trust, cooperation and coordination within the group. Regardless of the geography or their society, individuals and communities cannot live without being completely purified from the sense of ethnocentrism. But they can try to do their best, through education, individual and social efforts and works (Hofstede, 2001).

Individuals learning about their own cultures and developing awareness about their cultures are among the important factors that increase the success of intercultural communication. An individual who knows his own culture and recognizes his cultural norms and behaviours, would be aware that behaviours are reflections of the values related to a culture, that start right from the childhood. Values that are defined as normal, natural in an individual's culture could be perceived differently in other cultures, or they could be totally meaningless in other cultures. This is the basic rule of intercultural communication and individuals need to possess a certain level of sensitivity for the communication process to be held successfully (Soydaş-Uzunçarşılı, 2010; Ügeöz, 2003). As already expressed by Gürkaynak Çuhadar (2013), getting to know each other and establishing communication are important means of breaking biases and stereotype ideas between individuals and societies. This way, the awareness of individuals or societies regarding their culture increases, while at the same time they start recognizing biases and stereotype ideas as they get to know the similarities and common points with other cultures. From another point of view; developing the ability of living with cultural differences will help addressing obstacles such as ethnocentrism that limit intercultural relations.

Purpose

The purpose of this study, conducted on the basis of above given thoughts, has been defined as determining whether the education provided has any effects on the ethnocentrism levels of prospective students. With this in mind, answers have been sought for the below given problems and sub-problems.

Problem

Does the project assignment based on intercultural education have any effect on the ethnocentrism levels of the prospective primary school teachers?

Sub-problems

1. Is there a significant difference between the "Ethnocentrism Scale" pre-test score averages of the trial and control group students?

2. Is there a significant difference between the "Ethnocentrism Scale" final test score averages of the trial and control group students?

3. Is there a significant difference between the "Ethnocentrism Scale" pre-test / final-test score averages of the trial group students?

4. Is there a significant difference between the "Ethnocentrism Scale" pre-test / final-test score averages of the control group students?

Method

This section includes the study pattern, study group, data collection tools used in the experimental actions, experimental action process, data collected in the study and the analysis of those data.

Research Pattern

This study has been designed in accordance to a quasi-experimental design with a pre-test final-test control group. "Quasi-experimental models are preferred in cases where the controls required by true experimental models cannot be met or are insufficient" (Karasar, 2015, p. 104).

Study Group

The study group consists of 118 prospective teachers from public universities in Ankara and Niğde. 74 prospective teachers from the Education Faculty Department of Primary School Teaching at a public university in Ankara comprised the trial group. The 44 prospective teachers from the 3rd grade of Education Faculty Department of Primary School Teaching at the university in Niğde comprised the control group.

Method Observed in Application Study

The application study has been conducted during spring semester of 2014-2015 academic year (14 weeks) with 3rd grade students from the Faculty of Education, Department of Basic Education – Primary School Education of a public university in Ankara. The relevant acquirements of the theme "Power of Visual Culture", selected under the project title "Power of Visual Arts – Intercultural Communication", and the specified classes have been associated under the scope of interdisciplinary approach. Furthermore, the teaching schedule of the project has been established in consideration of the recommendations provided by Banks (2013) and Mahoney & Schamber (2004).

Stages of Project Application Study

Formation and Application of the Project Plans: Project study has been formed on the three pillars given below:

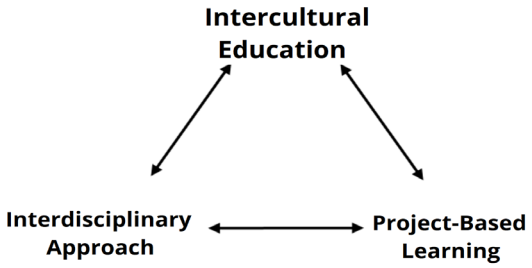

Figure 1. The dimensions used in the study

Under the scope of the project study's theme, the place and relevant acquirements of concepts such as intercultural communication, cultural difference and variety, intercultural awareness, bias, ethnocentrism and stereotype thinking have been examined in relation to the primary school curriculum. It has been observed that the theme is mostly included in the society-related fields of the curriculum such as Visual Arts, Social Sciences, Life Sciences and Turkish Classes. The relevant acquirements of Mathematics Teaching in the curriculum have also been defined as a requirement of the project scope (MoNE, 2014; https://serc.carleton.edu/sp/library/interdisciplinary/how.html). The acquirements of the class subjects given by placing the Visual Arts Class at the centre have been associated as follows, in line with interdisciplinary approach:

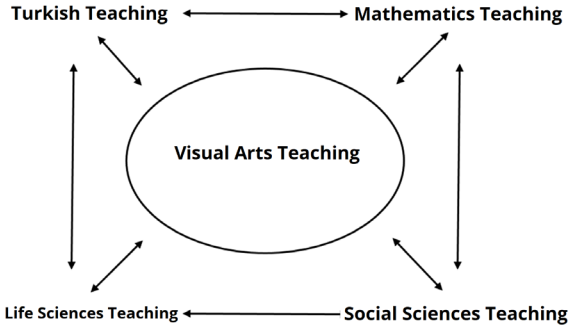

Figure 2. Associating disciplines in the study

At the application stage, the prospective teachers have prepared their presentations indicating the research process and outcomes, forming their project files. In line with the interdisciplinary approach, the acquirements, values and skills have been correlated with the cultural product or art work they were going to work on. During this process, two or three dimensioned products have been created with designs. The project has ended following the exhibition of these products.

Data Collection Tool

"Ethnocentrism Scale", developed by Neuliep and McCroskey (1997) and adopted into Turkish by Üstün (2011:74-77), has been used as data collection tool. The original format of the scale consists of 22 items and is 5 point Likert type but Üstün (2011) adopted it to Turkish by adding 20 items after doing some works on language equivalence, validity and reliability. The maximum points to be scored in the scale is 100 and the lowest is 20. Items 4, 7, 9, 12, 15 and 19 of the scale are being scored in reverse. Cronbach Alfa coefficient has been found to be .82 in the reliability study (Üstün, 2011).

Data Analysis

In order to interpret the points scored in "Ethnocentrism Scale" independent sample t-test and "One-Way Covariance" (One-way ANCOVA) analysis have been used during the pre-test and final test stages of the experimental design of the study (Büyüköztürk, 2010). Analyses have been performed by using SPSS 24.00 package program. Furthermore, Bonferroni correction has been used, which is the preferred correction option in covariance analysis comparisons. The reason behind using the Bonferroni correction is that it is more precise than Sidak (Can, 2014).

Findings

Findings of the study have been presented in line with sub-problems.

Comparing the "Ethnocentrism Scale" Pre-Test Point Averages Score of Trial and Control Group Students

Table 1. *t-Test Results for Independent Groups Related to the Ethnocentrism Scale Pre-Test Points of Trial and Control Group Students*

Groups	*N*	*M*	*sd*	*df*	*t*	*p**
Trial	74	52.43	4.41	116	-3.873	.000
Control	44	55.97	5.40			

*$p < .05$

Table 1 indicates that before the training, the pre-test point average of trial students was $M = 52.43$; and the pre-test point average of control students was $M = 55.97$. This difference between the pre-test points of trial and control group students [$t = (116)$; $p < 0.05$] is significant. This finding is an indication that there is a significant difference between the Ethnocentrism Scale pre-test points of the trial and control group students. In other words, the ethnocentrism level related pre-test points of control group students is much bigger than those of the trial group students. A lower score in ethnocentrism scale indicates a more positive perspective than a higher score. Therefore, the significantly lower pre-test point averages of trial group students at the beginning of the project, when compared to the pre-test point averages of control group students, can be interpreted as trial group students being in a better position in terms of ethnocentrism levels. The formula $d = (MA\text{-}MB)/\sigma$ is being used for the calculation of the effect size of the resulting difference. While MA-MB represents inter-average difference, σ is the standard deviation value of difference points. Furthermore, effect size

values are expressed as .02 small, .05 intermediate and .08 big (Cohen, 1977; Cited by Olkun, Yıldız, Sarı, Uçar, & Turan, 2014). When the obtained values are put in place in the formula, then *d*= (55.97-52.43)/.915 = 3.86.

Comparing the Ethnocentrism Scale Final-Test Point Averages of Groups, Corrected on the Basis of Pre-Test Points

As the pre-test points of the trial and control group students were not on the same level in this study, final-test points have been compared by controlling pre-test points of both groups, with the purpose of ensuring the effectiveness of the experimental procedure. The findings of the covariance analysis (ANCOVA) related to the comparison of "Ethnocentrism Scale" final-test point averages of trail and control group students are given in Table 2.

The averages related to the actual final-test points achieved by the groups in ethnocentrism have been calculated as 51.00 in trial group and 54.68 in control group. The ANCOVA analysis results, conducted to test whether the difference observed between groups on the basis of the corrected average points is meaningful, are given in Table 2:

Table 2. *ANCOVA Results of the Ethnocentrism Scale Final-test Points of the Groups Corrected on the Basis of Pre-test Points*

Variance Source	*Sum of Squares*	*df*	*Sum of Squares*	*F*	*p**	η^2
Pre-test (Regression)	0.007	1	.007	0.000	.987	
Groups (Final-test)	332.242	1	332.242	11.91	.001	.094
Error	3207.538	115	27.892			
Total (Corrected)	3581.593	117				

**p*< .05

ANCOVA results (Table 2) indicate a statistically meaningful difference between the final-test point averages, corrected on the basis of Ethnocentrism Scale pre-test point averages, of the trial group students that are part of the study group of the research (F(1-115) =27.892, p<.05). The η^2 (eta square) value, calculated to reveal the effect of independent variable on the dependent valuable, is .094. Eta square values are interpreted as .10 small, .24 intermediate and .31 large effect (Cohen, 1977; Cited by Sarı & Tertemiz, 2017).

With this purpose of determining in which group's favour the difference between the corrected final-test points of the groups was, Bonferroni multiple comparison test has been conducted. Results of the Bonferroni test are given in Table 3.

Table 3. *Bonferroni Test Results of the Ethnocentrism Scale Final-test Points of the Groups*

Groups	*Groups*	*Difference Between Aver.*	*standard error*	*p*	*Cause of Difference*
Trial	Control	-3.688	1.068	1.000 .001*	Trial>Control

**p*< .05

According to the Bonferroni multiple comparison test results (Table 3) conducted with the purpose of revealing the differences between the corrected "Ethnocentrism Scale" final-test points of the groups, the experience process in trial group (M_{Trial}= 50.99) was positively and meaningfully lower than the experience group in control group ($M_{Control}$= 54.68). This finding indicates that there is a meaningful difference between the "Ethnocentrism Scale" final-test points of the students in trial and control groups. This end-of-the project finding proves that the difference in favour of the trail group in pre-test points continued in the final-test points.

Table 4. *t-Test Results of the Ethnocentrism Scale Pre-test and Final-test Average Points of the Groups*

Groups	*Measure*	*N*	*M*	*sd*	*df*	*t*	*p**
Trial	Pre-test	74	52.43	4.41	73	102.1	.001
	Final-t.	74	51.00	4.83			
Control	Pre-test	44	55.97	5.40	43	68.6	.001
	Final-t.	44	54.68	5.90			

**p*< .05

Table 4 indicates a significant difference between the point averages before (pre-test) and after (son-test) the experimental procedure in the trial group [$t_{(73)}$= 102.1, p< .05]. The same applies to the control group, where there is a significant difference between pre-test and final-test point averages [$t_{(43)}$= 68.6, p< .05]. In other words, there was a positive-oriented reduction in the ethnocentrism points in the trail group at the end of the experimental procedure. And similarly, there was also a positive-oriented reduction in the ethnocentrism points of the control group at the end of the experimental procedure. Despite the fact that there was a positive development in both groups, the changes in the opinions of the trial group students were significantly different than those of the control group students when groups were compared.

Result and Discussion

According to the findings of this study where the effects of the education provided under the scope of intercultural education on the ethnocentrism levels of prospective teachers is examined, there has been a positive-oriented change in the ethnocentrism scores of both trial and control group students in group comparisons between their pre and final test point averages. But this change is significant in favour of the trial group in the group comparison. In other words, this project study had a positive impact on the ethnocentrism levels of prospective teachers.

Considering the findings acquired, the study by Demir and Üstün (2017) examining the intercultural awareness and ethnocentrism levels of students in terms of certain variables in various classes is supportive of this current study. The study reports that the training given to the individuals is important in terms of a positive-oriented change in intercultural awareness and ethnocentrism levels. As expressed by Ross (1994), the change of such beliefs are not only affected by education methods but also by active interventions, diversified application of education methods and techniques or application process. In a manner supporting this idea, the prospective teachers participating in our study have expressed their gratitude for conducting a study, making new designs and products by gaining new information about their own cultures and different cultures (Aslantaş & Tertemiz, 2016). Approaching the matter with a different perspective, Öksüz and Baba Öztürk (2016) reported that the awareness of individuals with regards to cultural differences plays an important role in determining the strategies to be used during the process of overcoming communication disputes. Considering the positive development in the ethnocentrism points of the prospective teachers, it is possible to say that individuals with a high level of awareness about cultural differences would be more constructive when it comes to settling the disputes in the process of intercultural communication, attach importance to strategies that are based on cooperation and distance themselves from behaviour that could lead to insolubility of the issues. Another fact included in the findings was that the prospective teachers generally scored average points in the scale. The findings acquired in

this study are supportive of Hammond and Axelord's (2006) idea that individuals believe it is difficult to understand, attain a meaning or accept the cultures of different communities through a brief education.

In parallel to Sikorskaya (2017) view that intercultural education should not be provided to migrants or individuals with minority cultures only, but rather to the whole of the society, it is possible to say that through the education provided to the prospective teachers the awareness of the individuals has increased and reached a more positive level in terms of ethnocentrism. Furthermore, as suggested by Bennett (2009) and Perry and Southwell (2011), it is also possible to say that when they become teachers in the future, the current students could be performing intercultural education works that include class contents and activities emphasizing the interaction between their own cultures and different cultures. The possibility that the teachers could be providing similar methods of education to their students in the future may prevent or minimize biases, stereotypes and ethnocentrism that could cause tensions between individuals and societies through the knowledge and abilities they will gain. Even though the theme of this project was intercultural education, bias, stereotypes and ethnocentrism are effected many several other factors too. This can be listed as physical and psychological handicaps, age, gender, economic and social status, race, language spoken, type of education received, place they were raised as well as movie and media sector (Banos, 2006; Bayles, 2009; Boyd, 2015; Çayır & Ceyhan Ayan, 2013; De et al., 2015; Fretheim, 2007; Gay, 2014; Ryan et. al, 2007; Spinthourakis et al., 2009; Talib ve Hosoya, 2010; Westrick & Yuen, 2007; Yuen & Grossman, 2009). The positive oriented development in the control group can be given as an example to this. Even though the education provided was not within the scope of intercultural education, the ethnocentrism points of the control group was also positively developed, even if it was not as much as that occurred in the trial group. Therefore, it is recommended that the issue is addressed in a multi-dimensional way through long-term studies. Similar studies can be conducted with foreign countries under international projects on a long-term and international basis to allow prospective teachers to meet a different culture or cultures and experience different communications. This way it would be possible to conduct projects where intercultural education is studied more actively and individuals can be improved in terms of ethnocentrism.

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Appendix

Çatıdaki Kozalaklar

The Pine On The Roof

İlişkilendirilen Disiplinler ve Öğrenme Alanları/ Disciplines Associated and Fields of Learning

MATEMATİK DERSİ/MATHS
- Geometry
  -Geometrik cisimler / geometric objects
  -Örüntü ve süslemeler /patterns and decorations
  -Simetri / symmetry
  Üçgen, kare, dikdörtgen / triangle, square, rectangle
- Ölçme / Measurement

SOSYAL BİLGİLER DERSİ/SOCIAL STUDİES
- Birey ve Toplum / Individual and Society
- Kültür ve Miras / Culture and Heritage
- İnsanlar, Yerler ve Çevreler / People Places and Environment

BİLİŞİM TEKNOLOJİLERİ DERSİ/ INFORMATION TECHNOLOGY
- Bilişim Teknolojilerinin Kullanımı / Usage of Information Technology

GÖRSEL SANATLAR DERSİ/ VISUAL ARTS
- Kültürel Miras / Cultural Heritage

TÜRKÇE DERSİ/TURKISH
- Görsel Okuma / Visual Reading
- Görsel Sunu / Visual Presentation

Öğrenci-1 /Gazi Eğitim Fakültesi Sınıf Öğretmenliği 3.Sınıf

Kastamonu'nun İnebolu ilçesine ait olan İnebolu Konaklarının çatılarında doğal bir malzeme olan Marla taşı kullanılır. Bu taşlar Karadeniz'in sert rüzgarlarına dayanıklı, büyük ve geçmişi çok eskilere dayanan taşlardır. Bu çalışmada Marla taşının yapısını ve çatılara döşeniş şeklini, tıpkı bir kozalağın yapısına benzettim ve insanların bu taşı çatılara döşerken, kozalağı incelemiş olabileceklerinden esinlendim. Marla taşını ve kozalağı göz önünde bulundurduğumda tıpkı avizeye benzeyen, dalından sarkmış kozalağı andıran ve Marla taşının şeklini barındıran bu özel çalışmayı ortaya çıkardım.

A natural building material, Marla stone is used on the roof of İnebolu Mansions which belong to İnebolu, province of Kastamonu. These Stones are big and windproof when considered harsh winds in the Black sea region.They date back to very old times.In this study,I assimilated the structure of Marla stone and its way of being floored to just like the structure of a pine cone and I thought that people might be inspired of pine cones when covering their roofs with Marla Stones. When I take Marla stone and pine cone into consideration, I've come up with this special study which looks exactly like a chandelier, resembles a pine cone hanging from the branches and containing the shape of Marla Stones.

İlişkilendirilen Beceri ve Değerler / Attainments and Merits Associated

BECERİLER / ATTAINMENTS
- Eleştirel düşünme becerisi / Attainment of critical thinking
- Yaratıcı düşünme becerisi / Attainment of creative thinking
- Öz yönetim / Self management
- İletişim becerisi / Attainment of communication
- Araştırma becerisi / Attainment of survey
- Problem çözme becerisi / Attainment of problem solving
- Karar verme becerisi / Attainment of dercisin making
- Bilgi teknolojilerini kullanma becerisi / Attainment of using information technology
- Zaman ve kronolojiyi algılama becerisi /

DEĞERLER / MERITS
- Barış/ Peace
- Sorumluluk / responsibility
- Estetik / Aesthetics
- Çalışkanlık / Industriousness
- Kültürel Duyarlılık / Sensitivity

Öğrenme Alanları 2014-2015 İlköğretim Programından Alınmış Olup 1-5.sınıf konularına dayalıdır.

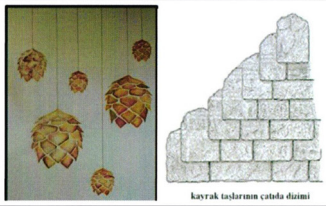

Figure 3. Student 1-Class Flow Chart

AĞLAYAN SÜTUN

CRYING COLUMN

İlişkilendirilen Disiplinler ve Öğrenme Alanları/ Disciplines Associated and Fields of Learning

GÖRSEL SANATLAR DERSİ/VISUAL ARTS
- Görsel İletişim ve Biçimlendirme/Visual Communication and Formalization
- Kültürel Miras / Cultural Heritage
- Sanat Eleştirisi ve Estetik/Art Criticism and Aesthetics

SOSYAL BİLGİLER/SOCIAL STUDİES
- Kültür ve Miras / Culture and Heritage
- İnsanlar Yerler Çevreler / People Places and Environment

MATEMATİK/MATHS
- Ölçme/Quantification
- Geometri/Geometry
- Simetri/Symmetry

Ağlayan sütun İstanbul'da bulunan 542 yılında Bizans İmparatoru tarafından yapılan Yerebatan sarnıcında ki en dikkat çekici sütundur. Sütunun üzerindeki şekiller oyma ve kabartma halinde tavus gözü, sarkık dal ve gözyaşı şekillerinin tekrarından oluşmuştur. Sütun üzerindeki gözyaşına benzer şekillerin bulunmasının nedeni, Yerebatan sarnıcının yapımında yüzlerce kölenin ölmesidir. Ağlayan sütun da ölen kölelerin anısına dikilmiştir.

Crying Column located on İstanbul. Yerebatan Sarnıcı is the most attractive. Columnth at built by Byzantine Emperor. Figures on the column from repetition of peacock, flab by branch and teard rop figure in the shape of intaglio and relief. There as on why there are shapeslike in tears on columnis that the death of hundreds of Yerebatan Sarnıcı. Crying column is consructed in memory of the slaves.

İlişkilendirilen Beceri ve Değerler / Attainments and Merits Associated

BECERİLER / ATTAINMENTS
- Yaratıcı Düşünme Becerisi/Attainment of Critical Thinking
- Araştırma Becerisi / Attainment of Survey
- Gözlem Becerisi/Attainment of Observation
- Karar Verme Becerisi / Attainmentof Decision Making

DEĞERLER / MERITS
- Estetik /Aesthetics
- Bilimsellik /Scienfication
- Çalışkanlık /Industriousness

Öğrenme alanları 2014-2015 İlköğretim Programından Alınmış Olup 1-5.sınıf Konularına Dayalıdır.

Öğrenci -2-Gazi Eğitim Fakültesi, İlköğretim-Sınıf Öğretmenliği A.B.D

Figure 4. Student 2 - Class Flow Chart

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Varying Opportunities to Respond to Improve Behavior of Elementary Students with Developmental Disabilities

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Abstract

This study investigated the effects of varying opportunities to respond when using a behavior management program with three elementary school students with developmental disabilities in a small group special education setting. These students exhibited both academic and behavioral difficulties. With the implementation of Class-Wide Function-Related Intervention Teams (CW-FIT) with low opportunities to respond (OTR), students increased their active engagement and correct responses, as well as decreased their disruptive behaviors. When CW-FIT with high OTR was implemented, students showed an even greater improvement than CW-FIT with low OTR. Higher rates of OTR resulted in higher levels of active engagement and correct responses and decreases in disruptive behavior for all three students. These results indicate that CW-FIT in combination with high OTR can help elementary school teachers manage students' behavior and increase students' correct responding when implemented in a small group special education setting.

Keywords: Elementary School, Special Education, Opportunities To Respond, Positive Reinforcement

Introduction

Challenging behavior and academic failure often co-occur in elementary school, especially for students with developmental disabilities (Desrochers & Fallon, 2014). Specifically, students with autism spectrum disorders (ASD) and attention deficit/hyperactivity disorder (ADHD) often have difficulties with behavior. Such students demonstrate significantly higher levels of behavioral and emotional difficulties across areas such as attention problems and internalizing and externalizing behaviors than typically developing peers (Ashburner, Ziviani, & Rodger, 2010).

Problem behavior does not only affect students, but also impacts teachers. There is an inverse relationship between the rate of challenging behavior and the rate of teacher instruction (Sutherland & Wehby, 2001): Teachers provide more instruction to students without disruptive behavior than to students with disruptive behavior (Carr, Taylor, & Robinson, 1991). This can be extremely detrimental to elementary students with developmental disabilities who already struggle with the academic instruction they receive. Due to the complicated relationship of problem behavior, academic success, and teacher instruction it is important for students with developmental disabilities to receive both academic and behavioral intervention.

In a meta-analysis of behavioral interventions used to decrease disruptive behavior, on average across studies, group contingencies were ranked the most effective (Stage & Quiroz, 1997). Elementary school teachers use group contingencies to reward students based on the behavior of all the members of a group, thus motivating them to exhibit appropriate behavior. Additionally, several evidence-based practices to increase the academic success of students with challenging behavior were found to include direct social skill instruction, teacher praise and reinforcement, and increasing students' opportunities to respond (OTR) during instruction (Lewis, Hudson, Richter, & Johnson, 2004).

Opportunities to Respond

OTR refers to the number of chances students are given to respond individually or as a group to questions from the teacher (Sutherland, Alder, & Gunter, 2003). Increasing OTR has been found to be an effective practice for teachers (MacSuga-Gage & Simonsen, 2015), as each student builds fluency with increased accuracy for correct responses. Studies have demonstrated a high correlation between high OTR and increased on-task behavior and decreased disruptive behavior for students with challenging behaviors (Conroy, Sutherland, Haydon, Stormont, & Harmon, 2009). Carnine (1976) determined that increasing OTR in an elementary school classroom resulted in increased on-task behavior, increased correct response, and decreased rates of disruptive behaviors. West and Sloane (1986) examined the relationship between slow and fast presentation of OTR implemented with elementary school students who displayed behavioral problems and found high rates of OTR resulted in lower rates of disruptive behavior. Skinner and Shapiro (1989) found that high rates of OTR led to increased words read correctly and fewer words read incorrectly. Sutherland et al. (2003) examined the effects of OTR on correct academic responses and disruptive behavior for elementary students with emotional and behavioral disorders. They found that when OTR increased, time on task, teacher praise, and correct responses from students increased, while disruptive behavior decreased. Sutherland, Wehby, and Yoder (2002) found a positive correlation between high OTR, academic talk, and teacher praise in kindergarten thru 8th grade self-contained classrooms for students with behavior and learning problems. Increased OTR resulted in higher use of many other

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evidence-based practices: for example, praise, error correction, and feedback. As students respond more frequently, teachers have more opportunities to provide feedback and praise. Students are able to gauge their own learning based on this feedback. These studies showed that increasing OTR increased on-task behavior as well as academic success of students with challenging behavior.

Class-Wide Function-Related Intervention Teams

One intervention that incorporates many evidence-based practices is Class-Wide Function-Related Intervention Teams (CW-FIT; Wills et al., 2010). CW-FIT is a group contingency behavior management program used to increase elementary students' on-task behavior and decrease disruptive behavior for the whole class, as well as individual students who may display problem behaviors. Students are taught specific social skills and earn group rewards for exhibiting the skills. CW-FIT integrates direct instruction on social skills, group contingencies, and behavior specific praise.

CW-FIT is designed based on a theory of change in which evidence-based classroom management procedures, and training thereof, leads to change in teacher practice that translates into improved outcomes for students. For example, direct instruction of functional social-communication skills has proven to be highly effective (Nelson et al., 1998; Lien-Thorne & Kamps, 2005). Combined social skill teaching and delivery of reinforcers promotes improved behavioral outcomes (Kamps, Tankersley, & Ellis, 2000). Group contingency programs, including reinforcers for appropriate rule following behavior, and mild, consistent consequences for inappropriate behavior, while focusing attention on appropriate behaviors, are especially effective with high risk students (Coogan, Kehle, Bray, & Chafouleas, 2007; Thorne & Kamps, 2008). The empirical evidence, as briefly described, support the conceptual logic linking CW-FIT components to the amelioration of disruptive behaviors and improved student on task behavior.

Kamps and colleagues (2015) conducted a randomized trial of CW-FIT with 17 elementary schools over a 4-year time period. Results showed classrooms that used CW-FIT had a significant increase of on-task behavior (52% to 83%) during the intervention phase, compared to the comparison group (50% to 56%). Average praise during intervention increased from 4 to 40 praises per 20 min interval, while the comparison teachers showed little change (4.46 to 4.62 praises). Average reprimands by CW-FIT teachers decreased from 7.48 to 4.45 per 20 min interval, while reprimands increased in the comparison group (8.42 to 9.49).

There is strong evidence across multiple studies supporting the effectiveness of CW-FIT in elementary general education classrooms (Caldarella, Williams, Hansen, & Wills, 2015; Kamps et al., 2015; Kamps et al., 2011; Wills, Iwaszuk, Kamps, & Shumate, 2014). These studies showed similar outcomes with increased on-task behavior, decreased disruptive behavior, and increased teacher praise in general education classrooms. This study extends these results by implementing the method in a special education small-group setting and additionally examining the effects of varied OTR, which may influence the effectiveness of the intervention (MacSuga-Gage & Simonsen, 2015).

Purpose and Research Questions

Considerable evidence supports the effectiveness CW-FIT and of high rates of OTR used in elementary classes that include students who exhibit challenging behavior. However, none of the CW-FIT studies were performed with small groups in special education classrooms, nor were OTR examined. The purpose of this research was to determine whether CW-FIT would be effective when used with elementary students with academic and behavioral difficulties in a small group special education class and whether varying OTR would affect outcomes. To examine these practices in this context, the study sought to answer the following specific questions:

1. What are the comparative effects of low OTR versus high OTR with CW-FIT on active engagement, disruptive behaviors, and correct responses for elementary students with developmental disabilities in a small group special education setting?

2. What are the comparative effects of low OTR versus high OTR with CW-FIT on teacher praise and reprimands delivered to elementary students with developmental disabilities in a small group special education setting?

Method

Setting and Participants

This study took place in a six-week summer practicum conducted by special education teacher candidates for elementary students with developmental disabilities. The study was conducted in the western United States. The participating students received academic and behavioral instruction in a small class with a licensed special education teacher. The students then joined a class of approximately 15 students with three teacher candidates for specialties—physical education, music, and art. The female special education teacher with English as her first language had two years of experience teaching students with mild/moderate disabilities and prior to the study had completed training to implement CW-FIT. Students participated in 25 min of reading instruction and 25 min of math instruction.

Participants included three elementary school students identified as having academic and behavioral difficulties. All three were classified under IDEA as having a developmental disability, and all had an Individualized Education Program (IEP) with behavioral goals. Students were nominated by staff of the participating school district to participate in the study due to behavioral challenges and academic needs. Students were enrolled in the study when parents provided signed consent before the practicum began.

Derek. Derek was an 8-year-old third grade boy with English as his first language. Derek received services in a self-contained special education classroom and resource classroom for 180 min per day under the classification of autism. Previous testing showed Derek performed in the low average range in math and reading according to the Woodcock-Johnson III Tests of Achievement (WJ-III; Woodcock, McGrew, & Mather, 2001). Derek's cognitive assessment showed his abilities in the average range (full scale IQ= 102) as measured by the Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV; Wechsler et al., 2003). The Behavioral Assessment System for Children, Second Edition (BASC-2; Reynolds, & Kamphaus, 2006) showed Derek exhibited atypical behaviors and hyperactive behaviors in the clinically significant range. Though Derek had a behavioral intervention plan prior to this study to address non-compliance and independently entering the classroom, it was not used during the study.

Joshua. Joshua was an 11-year-old sixth grade boy with English as his first language. He received services in a self-contained special education classroom for 360 min per day under the classification of autism. Joshua had average basic reading skills (WJ-III standard score [SS] = 90) and below average math skills (WJ-III SS = 62). His cognitive abilities were

below average (nonverbal IQ = 76) as measured by the Comprehensive Test of Nonverbal Intelligence (CTONI; Hammill, Pearson, & Weiderholt, 1996). Joshua's behavior was considered clinically significant as measured by the BASC-2 (Behavior Symptom Index = 77). Prior to the study his behavior challenges involved frequent off-task behavior characterized by staring away from the teacher and neither responding to or engaging in the lesson.

Trent. Trent was a 10-year-old Caucasian male in fifth grade. Trent received services in a self-contained special education classroom and resource classroom for 180 min per day under the classification of other health impairment for ADHD. According to the WJ-III, Trent performed in the low average range in math (*SS*= 84), writing (*SS*= 84), and oral language (*SS*= 84). He had average cognitive abilities as measured by the WISC-IV (General Ability Index= 93). According to the BASC-2, his atypical behavior and attention problems were clinically significant. Trent had difficulty interacting with peers appropriately: He struggled to engage in appropriate conversation and often told peers what to do. He frequently called out during instruction.

Data Collection

Sessions were videotaped, and observers collected data from the recordings. Trained observers measured all dependent and independent variables using Multi-Option Observation System for Experimental Studies (MOOSES; Tapp, Wehby, & Ellis, 1995), recording frequency and duration behaviors. Frequency behaviors included correct responses and disruptive behaviors of the students, along with OTR, praise rates, and reprimand rates of the teacher. Duration behaviors included active and passive engagement and disengagement. Behaviors were measured for the first 15 min of the reading lesson.

Observer training. Three observers, each with undergraduate degrees in special education, communication disorders, or English education, were trained to calculate all variables. These participants memorized the definitions of all variables in order to effectively and efficiently collect data. During training, which included practice videos and live sessions, they reached 85% interobserver agreement (IOA) before beginning to code study data.

Treatment fidelity. A procedural fidelity checklist was completed by an observer following each session to ensure that CW-FIT was implemented as outlined. This checklist included procedures such as rules displayed, point goal displayed, and timer used. CW-FIT was implemented with 95% accuracy over all sessions with a range of 72%-100%. Interobserver agreement. IOA for direct observations was calculated by researchers during 41% of the sessions using the MOOSES program which divided the number of agreements by the number of agreements plus disagreements, then multiplied by 100. Observers had to code the same behavior within a five second window to count as an agreement. The IOA for frequency behaviors was 85.23%. IOA for duration behaviors was 96.23%.

Social validity. Social validity was assessed by a student questionnaire that included three open-ended questions and two yes/no questions regarding their participation in CW-FIT. These questions were used to assess what the students liked or did not like about CW-FIT and whether they would recommend CW-FIT for their peers.

Data analysis. Data were gathered, graphed in Microsoft Excel 2013, and analyzed daily. This visual representation was used for phase change decisions, as well as overall analysis of intervention effectiveness. Graphed data were analyzed for changes in levels and trends, which helped in discerning variability within phases (Kennedy, 2005). Excessive data variability indicated a lack of experimental control, which caused difficulty in drawing conclusions from the data. When the data were stable, the study moved to the next phase. As the study continued through phases, the separation of phases was also examined. Data that distinctly separated between phases showed a stronger functional relationship between the dependent and independent variables. Overlap that prevented a clear separation between phases reflected another lack of experimental control, and minimal to no conclusions could be drawn from these data. Visual analysis was used to demonstrate experimental control as well as the effectiveness of the interventions.

Student Measures

Active engagement. Active engagement was defined as the student appropriately working on the assigned or approved activity (e.g., reading orally, writing words, answering questions). With MOOSES, the observers calculated the duration of active engagement, passive engagement (e.g., listening), and disengagement (e.g., not working appropriately). Active engagement was graphed as the percentage of time that the student was actively engaged. We focused on active engagement (versus passive engagement) as we expected the students to be actively participating in reading and responding.

Correct responses. During instruction observers used a frequency count to track the correct responses for individual students. A correct response was defined as when, within 5 seconds, the answer to academic instruction or academic behavior matched, or closely approximated, the answer on the teacher's worksheet or desired by the teacher. For example, if a teacher gave an OTR such as "What is the first word on the reading list?" and the student responded correctly within 5 seconds, a correct response was recorded. If the student responded incorrectly within 5 seconds, the observer marked the response incorrect. If the student didn't respond within 5 seconds, this was marked as a non-response. Correct responses also included behaviors such as writing spelling words or opening a book to the correct page after a teacher prompt. Percentage of correct responses was calculated as number of correct responses divided by number of correct responses plus incorrect responses plus non-responses.

Disruptive behavior. Disruptive behavior was defined as any physical or verbal behavior by a student that disrupts or distracts from instruction. Examples of disruptive behavior included talking out without raising a hand, arguing, name calling, being out of seat without permission, and using materials inappropriately (e.g., throwing, hitting, or tearing materials). Observers used a frequency count to track the occurrences of disruptive behaviors, coding each incidence as a single occurrence unless the topography changed (e.g., the student rocked in his chair and then began tapping a pencil) or the behavior ceased for at least three seconds and then resumed. In these instances, multiple disruptive behaviors were coded.

Teacher Measures

Opportunities to respond. OTR was defined as an instructional question or statement from the teacher to the group of students or an individual student requesting an academic response orally or publicly: "What is the first word on the reading list?" "What is the first step to solve the problem?" "Please tell us your answer for Problem 2." In this study, all OTR were given orally due to the program used (described in the Intervention Procedures). Observers measured OTR using a frequency count.

Praise. Praise was defined as a verbal comment showing approval of a student's behavior over or above a simple acknowledgement of a correct response, this included behavior specific praise as well as general praise statements. Praise included verbal responses such as "Great job raising your hand!" or "Your handwriting is improving!" Non-examples included "Thank you." or "Alright." Observers used a frequency count to measure praise throughout each session. They tracked praise to an individual ("Billy, I like the way you did that sum!") separately from praise to a group ("Everyone is sitting quietly, great!").

Reprimands. Interactions scored as reprimands included admonishing a student, making negative statements about a student's social behavior, mention of negative consequences, or using comments intended to stop a student from misbehaving. Examples included, "I told you to be quiet." or "John, you need to stay in your seat." Observers used a frequency count to measure reprimands to individuals as well as reprimands to the group.

Procedures

The teacher used Level 4 of the Reading Mastery Signature Edition (RMSE; Engelmann, & Hanner, 2008) program during the reading instruction. The RMSE program is research based and includes direct instruction with scripted OTR. The students engaged in tasks to accurately read words using specific phonics skills and to define vocabulary that would be included in the text. Observation during the program ensured that the students performed similar tasks throughout the phases of the intervention. Although the RMSE program had scripted OTR for the teacher to use, she controlled the rate of delivery with a MotivAider (Levinson, Kopari, & Fredstrong, 2002), an electronic cueing device she wore which was set to vibrate at specific time intervals according to the intervention phase.

Baseline. During the baseline phase, the teacher did not have a specific behavior management system in place, allowing the dependent variables to be measured in an environment with little to no positive or negative reinforcement. The teacher did set a MotivAider to one-min intervals at which she gave an OTR. These baseline procedures measured the academic and behavioral performance of students without the CW-FIT intervention. During this phase the teacher gave an average of 1.16 OTR to the group per min.

Intervention phases. In this study two separate intervention conditions were compared: CW-FIT with low OTR and CW-FIT with high OTR.

CW-FIT with low OTR. The teacher directly taught the CW-FIT social skills (a) get the teacher's attention appropriately (b) follow directions the first time, and (c) ignore inappropriate behaviors (Wills et al., 2010). These skills were taught in three 10-min lessons using direct instruction with teacher modeling, teacher-student and student-student role-plays, practice, and review. The social skills, with corresponding steps, were posted on the board. The teacher reviewed the skills at the beginning of class during the intervention phases.

Because of the small number of students in the class, each student was his own team (independent group contingency), as done by Trevino-Maack, Kamps, and Wills (2015), rather than participating on a team of two to five students, which is the general practice for CW-FIT. All of the one-student teams were working for the same reward. During CW-FIT the teacher determined a criterion or set number of points a student must earn during the lesson to receive a reward. During the CW-FIT session the teacher set a timer to ring every two to three min. At each beep of the timer, the teacher gave praise and awarded points to each student who was engaged in appropriate behaviors as outlined by the posted social skills. At the end of the lesson each student who had met the previously determined criterion was given the reward (e.g., 2-min free time, painting, music, games, stickers, prizes).

During this intervention the MotivAider was set at one-min intervals to signal the teacher to give an OTR, as during baseline. This allowed for the effects of CW-FIT with low OTR to be measured and ensured that the OTR rates were not a conflicting variable in comparison to baseline. The teacher gave on average 1.11 OTR per min during this phase of the study.

CW-FIT with high OTR. The teacher used CW-FIT in this phase as outlined in the previous section but with high rather than low OTR. The MotivAider signaled the teacher to give an OTR at 15-sec intervals. The teacher gave on average 6.22 OTR per min during this phase of the study.

Research Design

This study used an alternating treatment design, enabling comparison of two treatments within a single subject (Cooper, Heron, & Heward, 2007). This began with a baseline phase to show the rates of the dependent variables without intervention. During the second phase, the study alternated between conditions (CW-FIT with low or CW-FIT with high OTR) in the form of a multi-element design. The intervention shown to be most effective was used in the final phase.

Results

Derek

Active engagement. As seen in Figure 1, some variability was apparent in Derek's active engagement within phases; however, no overlap occurred between the baseline and CW-FIT with high OTR phases. During CW-FIT with low OTR Derek's active engagement trended downward; in the high OTR phase the active engagement had an upward trend. Thus, CW-FIT with high OTR resulted in the highest levels of active engagement. Derek's active engagement increased significantly from an average of 28.60% during baseline to 50.53% during CW-FIT with low OTR, and ultimately to 78.08% during CW-FIT with high OTR.

Disruptive behavior. During baseline, Derek had significantly higher levels of disruptive behavior than during either intervention phase. There was some overlap between intervention phases, but ultimately CW-FIT with high OTR seemed to result in a greater decrease in disruptive behaviors: from a baseline average rate per min of 3.13 instances to 1.78 instances in the CW-FIT with low OTR phase and 0.75 in the CW-FIT with high OTR phase.

Correct responses. Similarly, Derek showed a lower level of correct responses during the baseline phase in comparison to intervention phases. CW-FIT with high OTR showed a stable level of performance, resulting in the highest percentage of correct responses. Derek's correct responses increased from an average baseline rate of 76.79% to 88.70% during the CW-FIT with low OTR phase and 96.65% during the CW-FIT with high OTR phase.

Joshua

Active engagement. Joshua's active engagement rates showed distinct differences in levels, as shown in Figure 2. CW-FIT with high OTR resulted in the highest rates of active engagement in comparison to baseline and CW-FIT with low OTR. Joshua's active engagement increased substantially from an average of 21.17% during baseline and 34.75% during the CW-FIT with low OTR phase to 79.17% during the CW-FIT with high OTR phase.

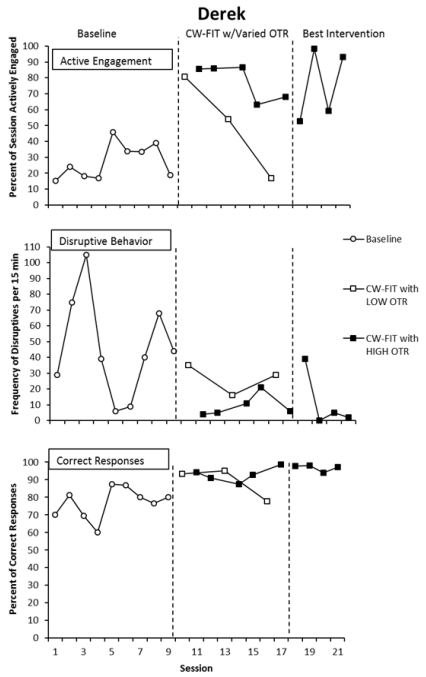

Figure 1. Derek's active engagement, disruptive behavior, and correct responses. Active engagement was calculated by minutes actively engaged/minutes of session x 100 graphed as the percentage of the observation that the student was actively engaged. Disruptive behaviors are graphed as the number of occurrences during the 15 min session. Correct responses were calculated as correct responses/(correct responses +incorrect responses + non-responses) x 100 graphed as a percentage.

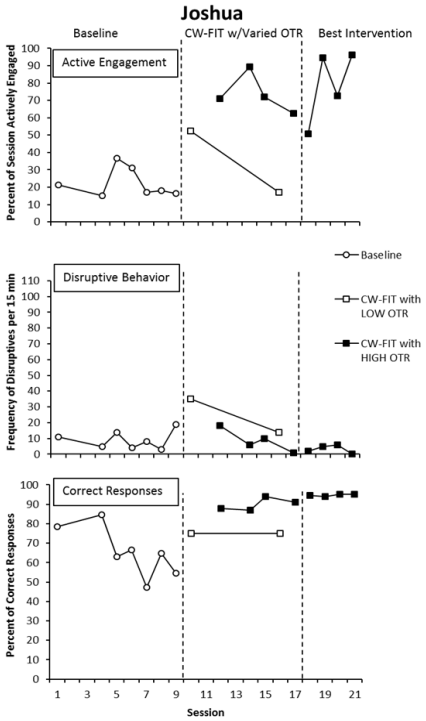

Figure 2. Joshua's active engagement, disruptive behaviors, and correct response. Active engagement was calculated by minutes actively engaged/minutes of session x 100 graphed as the percentage of the observation that the student was actively engaged. Disruptive behaviors are graphed as the number of occurrences during the 15 min session. Correct responses were calculated as correct responses/(correct responses +incorrect responses + non-responses) x 100 graphed as a percentage.

Disruptive behaviors. Some overlap was noted between phases for Joshua's disruptive behaviors. These behaviors appeared to increase with the initial implementation of the intervention phases, which created most of the overlap. Despite this initial increase (0.72 instances per min during baseline to 1.63 in the low OTR phase), rates stabilized over sessions, showing a greater decrease with the use of CW-FIT with high OTR (0.35 instances per min).

Correct responses. Throughout baseline Joshua's correct responses appeared to trend downward. With the implementation of the intervention phases, Joshua's percentage of correct responses increased and remained at stable levels. CW-FIT with high OTR yielded the highest number of correct responses, which had increased from a baseline average rate of 76.79% to 88.70% during the CW-FIT with low OTR phase and 96.65% during the CW-FIT with high OTR phase.

Trent

Active engagement. Trent's active engagement appeared to overlap during the initial implementation of the interventions, as seen in Figure 3. This continued until Trent's third session of the CW-FIT with low OTR phase, which showed a dramatic decrease. Despite this outlier, the effects on engagement appeared to separate over sessions, with the CW-FIT with high OTR phase showing the highest levels of active engagement. There was an increase from an average of 32.70% during baseline to 54.77% during the low OTR phase and 83.60% during the high OTR phase.

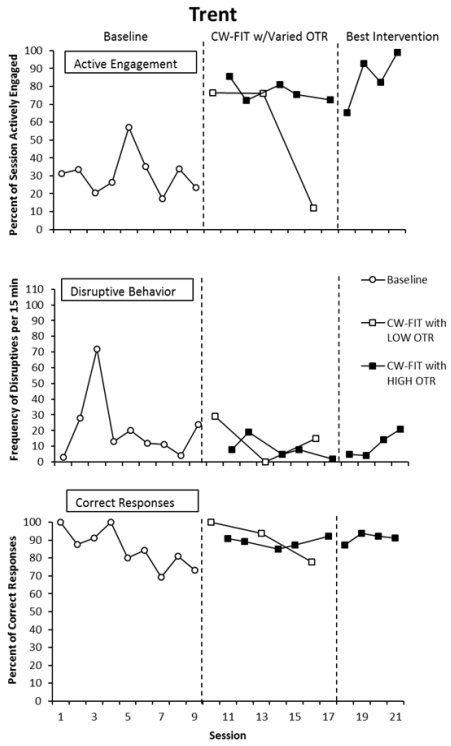

Figure 3. Trent's active engagement, disruptive behaviors, and correct response. Active engagement was calculated by minutes actively engaged/minutes of session x 100 graphed as the percentage of the observation that the student was actively engaged. Disruptive behaviors are graphed as the number of occurrences during the 15 min session. Correct responses were calculated as correct responses/(correct responses +incorrect responses + non-responses) x 100 graphed as a percentage.

Disruptive behaviors. Trent's disruptive behaviors showed more overlap between phases, though his levels were higher during baseline than during the intervention phases. The overlap between intervention phases created difficulty in visually determining which intervention was most effective. Based on averages, CW-FIT with high OTR was most effective in decreasing Trent's disruptive behaviors, which decreased from an average per min rate of 1.45 in-

stances during baseline to 0.98 in the CW-FIT with low OTR phase and 0.61 with the CW-FIT with high OTR intervention.

Correct responses. During baseline Trent's number of correct responses was initially at a very high level, but trended downward over time. Both interventions showed high levels of correct responses. But similar to baseline, Trent's pattern of correct responses trended downward over sessions during the CW-FIT with low OTR phase, becoming most stable during CW-FIT with high OTR. Trent's baseline rate for correct responses was 85.07%, increasing to 90.51% during the CW-FIT with low OTR phase and 92.37% during the CW-FIT with high OTR phase.

Teacher Behaviors

Praise. Patterns of increase with praise were very similar to patterns of increase with OTR. Higher levels of individual praise occurred during CW-FIT with high OTR than during baseline or CW-FIT with low OTR. Teacher praise rates for individuals increased from a baseline average of 0.07 praise statements per min to 0.17 during the CW-FIT with low OTR phase and 0.91 in the high OTR phase. Also group praise rates continuously trended upward, increasing from an average of 0.29 praise statements per min during baseline to 0.57 during CW-FIT with low OTR and 3.34 following the increase to high OTR.

Reprimands. The teacher's individual reprimands decreased with CW-FIT with low OTR for Derek and Joshua and decreased further with the use of CW-FIT with high OTR. Individual reprimand rates to Trent increased with both phases of CW-FIT. Overall, teacher reprimand rates to individuals decreased from 0.39 reprimands per min during baseline to 0.26 during low OTR and eventually to 0.12 during the high OTR phase. Teacher reprimand rates to the group decreased slightly from 0.19 per min during baseline to 0.10 during CW-FIT with low OTR and 0.15 during CW-FIT with high OTR.

Overall Effects

The implementation of CW-FIT increased active engagement for all three students, as seen in Figures 1, 2, and 3. Additionally, Derek and Trent decreased their disruptive behaviors, although Joshua's disruptive behaviors increased. All students increased their number of correct responses when CW-FIT was in use. Greater improvement was seen in all areas with CW-FIT with high OTR: All three students increased their active engagement and correct responses and decreased their disruptive behaviors during this phase.

Social Validity

All students communicated on the social validity questionnaire that they liked playing CW-FIT because they had the opportunity to "earn prizes" and they thought the "game was fun." All students reported other students should get to play CW-FIT "because it's fun." When asked what they didn't like about CW-FIT, two students reported "nothing." The third reported, "I'm very busy." His comment seemed to be referring to the fact that CW-FIT was keeping him academically engaged.

Discussion

With the implementation of the CW-FIT there was an immediate improvement in active engagement and correct responses for three elementary students with developmental disabilities in this special education small group setting. However, these levels showed a descending trend over time. In the phase of CW-FIT with low OTR, levels were similar to those during baseline, indicating that CW-FIT alone may not maintain high enough levels of active engagement and correct responses for students with disabilities. CW-FIT may create initial change in behavior for students with disabilities, but academic interventions may need to be added to maintain high levels of active engagement and correct responses over time.

During baseline, students' disruptive behaviors were variable. CW-FIT with low OTR showed lower disruptive behavior levels with less variability than baseline. These data support previous studies conducted in elementary general education classrooms, which also showed decreases in disruptive behaviors with CW-FIT (Caldarella et al., 2015; Kamps et al., 2015; Kamps et al., 2011; Wills et al., 2014).

The combination of CW-FIT and high OTR resulted in higher levels of active engagement, fewer disruptive behaviors, and higher levels of correct responses in comparison to baseline and to CW-FIT with low OTR, supporting the effectiveness of high OTR on academics and behavior (Carnine, 1976; Conroy et al., 2009; Skinner & Shapiro, 1989; Sutherland et al., 2003; West & Sloane, 1986). This intervention also resulted in the highest levels of teacher praise, supporting the correlation of OTR and praise (Sutherland et al., 2002).

This study demonstrates that CW-FIT can be used in a small group setting with elementary students with developmental disabilities to support instruction and behavior management. With CW-FIT and high OTR, students were actively engaged, effectively responsive, and appropriately behaved. Students with developmental disabilities need a behavior management program like CW-FIT, in combination with solid academic instruction with high OTR, to experience optimal behavioral and academic outcomes.

Limitations and Areas for Future Research

Some limitations must be considered when interpreting the results of this study. The number of participants and types of disabilities were limited, while their ages and academic ability varied. Further, CW-FIT traditionally uses an interdependent group contingency with two to five students on a team. In this study, we used an independent group contingency with one student on each team. Further research is needed to determine if individual teams are more appropriate for students with developmental disabilities or if interdependent group contingencies further improve behavior. Though IOA was calculated using MOOSES, it was not collected for the treatment fidelity checklist.

Another limitation is that Joshua had missing data points due to absences, which limits the ability to draw conclusions from his data. There also was minimal data points for all participants in the low OTR condition. The researchers moved to the most effective phase due to the negative behaviors observed in this condition. Additionally, this study was conducted during a summer program of only six weeks. Due to the time constraints, there was no return to baseline. Likewise, CW-FIT was not removed in order to measure the effects of high OTR with no formal behavioral management system, bringing into question whether the same positive results would occur with high OTR as the only intervention. The challenging behavior of the students and their high motivation to earn the rewards from CW-FIT seem to predict that the students would lack motivation to respond and follow rules without CW-FIT. However, this aspect was not investigated in this study. These limitations may impact the generalization of its findings.

Future research should include replication of this intervention with more participants with additional disability classifications (e.g., EBD, specific learning disabilities) in small group special education settings in elementary and secondary schools, as well as across academic subjects (e.g., math,

writing). Horner et al. (2005) suggested that interventions supported by single-case studies should be conducted in five separate settings with 20 different subjects in order to demonstrate to be considered an evidence-based practice. Additional research may include removing CW-FIT and using only high OTR to better understand the limitations of CW-FIT with students with disabilities. Future research should address the impact of CW-FIT on academic performance of students with and without disabilities by using curriculum-based measures or state testing.

Conclusions and Implications for Practice

Students with developmental disabilities need behavior management systems to decrease disruptive behavior and increase engagement. These students also need engaging instruction that gives them OTR to improve academic performance. This study demonstrated the effectiveness of CW-FIT, a behavior management program, delivered in combination with high OTR to help improve behavior and academic performance of elementary students with developmental disabilities. CW-FIT with high OTR resulted in higher levels of active engagement and correct responses as well as fewer disruptive behaviors in comparison to CW-FIT with low OTR. Results suggest that teachers in special education classrooms can use CW-FIT with high OTR to manage elementary students' disruptive behavior and to increase their ability to respond correctly.

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The Application of the Dynamic Teacher Professional Development Through Experimental Action Research*

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Abstract

In this study, it is aimed to provide professional development of teachers by improving their classroom teaching based on dynamic professional development approach. The research was conducted as experimental action research. In the first step of the action research, interview technique was used to determine the opinions of teachers and school administrators about the teachers' professional development problems. In the second step, data were collected from the students who volunteered in the school where the action research will be carried out to determine the professional development levels of teachers. In the third step, teachers were given feedback about the answers. In the fourth step, teachers prepared action plans by reflecting on feedback. In the fifth step, the teachers were taught to teach according to the action plans they prepared. In the last step, in order to determine whether the plans are effective, the procedures in the first step were repeated and the professional development levels of teachers were re-determined, and the final results were compared with the first results. As a result of the research, it was determined that the teachers' professional development could be provided when they implement the action plans that they prepare by reflecting on the student evaluations. It was determined that teachers faced obstacles in their professional development and existing professional development activities were carried out with unplanned and mere information transfer without considering the needs of teachers. It is suggested that teachers should be provided according to the needs of their professional development, to make use of the observations of the students in order to determine the needs and to plan the development activities to respond to the teachers' practices in the classroom and to solve the teacher's problems.

Keywords: Professional Development, In-Service Training, Reflective Thinking, Action Research

Introduction

There are rapid changes in every area. The changes in the economy, transportation, communication, politics, health, and social fields force people to adapt to them. The way to adapt to change is through education. Education is seen as a process of adapting one to the existing order (Akın & Arslan, 2014). As the current order is constantly changing, there are changes in the field of education as in other fields.

Education cannot remain indifferent to the changes of people. Especially the rapid changes after 1965 have created differences between X, Y and Z generations which were born in consecutive periods which lasted 15-20 years. Education has been reshaped according to these differences and has taken new approaches such as lifelong learning, distance education, and constructivist learning. The role of the teacher as the practitioner of these approaches has also changed.

It is suggested that the teachers in the Turkish Education System do not have sufficient qualifications and therefore the students do not get a qualified education (Abazaoğlu & Taşar, 2016). Turkey, in international tests such as PISA and TIMSS, is located in the last row (OECD, 2016; Polat et al., 2016). It is suggested that qualified teachers are needed to provide quality in education (Çelikten, Şanal, & Yeni, 2005). Because the quality education provided by the teacher significantly affects the success of the students (Kyriakides, Campbell, & Gagatsis, 2000; Muijs & Reynolds, 2000). There is a significant relationship between student learning and country development (Cingi & Güran, 2003; Çalışkan, Karabacak & Meçik, 2013). For these reasons, it is considered necessary to increase the qualifications of teachers (Bümen et al., 2012; MoNE, 2016). This may be through professional development activities (Katz, İnan, Tyson, Dixson, & Kang, 2017; Seferoğlu, 2004; Yetim & Göktaş, 2004).

Teacher professional development with the dynamic approach focuses on the teacher behaviors that affect student learning. It is essential that teachers develop action plans by reflecting on their practice. It is necessary to meet the personal development needs of teachers. Because teachers may be in different stages of development. The approach has eight factors that are effective at the classroom level. These are orientation, structuring, questioning, teaching modeling, application, the classroom as a learning environment, management of time and assessment (See appendix for more detailed explanation) (Creemers, Kyriakides, & Antoniou, 2013).

School administrators play a vital role in the professional development of teachers (Glanz & Neville 1997; Hallinger & Heck 1996; Sheppard, 1996). The creation of a professional learning culture for teachers was listed among the duties of administrators (Fullan, 2006). Administrators should develop the appropriate school culture to develop teachers' knowledge and skills (Elmore, 2000) and support teachers' professional development (Usdan, 2000). In this respect, the role of administrators is to align organizational features with professional development (Clement & Vandenberghe, 2001). Teachers should consider their administrators as professional development experts, and the necessary support, information, and resources should be expected from them (Payne & Wolson, 2000). However, school administrators cannot support teachers' professional development with their guidance (Çalık & Şehitoğlu, 2006; Ekinci, 2010). Because the concrete steps and training are not given to them. The dynamic ap-

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proach can provide concrete steps and tools that administrators can implement. These steps and tools can be introduced to them by short-term training. Thus, the barriers to the contribution of school administrators to teacher professional development can be removed. Therefore, there is a need to determine that the classroom teaching of teachers can be improved with the dynamic professional development approach.

Purpose

In this study, it is aimed to improve the classroom teaching of teachers based on the dynamic professional development approach. For this purpose, the following questions were asked during the research:

1. What are the opinions of teachers and school administrators about the problems of professional development of teachers?

2. How do the students evaluate their teachers' professional development levels?

3. Can teachers' in-class teaching be improved with the dynamic professional development approach?

Significance

In this study, it can be contributed to the success of the students by determining that the classroom teaching of teachers can be improved with the dynamic professional development approach. This is because the dynamic approach focuses on teacher behavior with proven effectiveness. An increase in the quality of classroom teaching behaviors of teachers may also increase student achievement.

Professionally developed teachers can contribute to the development of the country by improving the learning of the students. Because the success of students and the development of the country has been positively correlated. Countries that are successful in international examinations such as PISA and TIMSS are generally developed countries.

The dynamic approach can contribute to pre-service teacher education with its theoretical background. The increase in the quality achieved through the implementation of the approach can provide an understanding of the importance of the role of teacher behavior in student achievement. During the training of teachers, the factors determined by the dynamic approach can be provided and the quality of teachers can be improved.

In-service teacher training can be improved through the implementation of the dynamic approach. The approach is to determine the professional development needs of teachers and to ensure their professional development according to the determined needs. The content can be arranged according to the needs determined in the in-service training which are a part of professional development. Therefore, in-service training oriented toward needs may be more useful for teachers.

The dynamic approach may make it easier for school administrators to guide teacher professional development. The approach provides concrete steps and tools that administrators can implement. Thanks to the training, school administrators can use these steps and use the tools. Thus, the barriers to the contribution of school administrators to teacher professional development can be removed.

This research can contribute to research on teacher professional development. Researches that should be aimed at improving teacher professional development cannot go beyond identifying problems in professional development. This research can be an example in terms of demonstrating that teacher professional development can be achieved through the dynamic approach. The results of the research can be confirmed by new research.

Method

This study is action research. The frequent use of action research in the professional development of teachers and the contribution of action research to the practitioners rather than the theory were effective in the selection of this method. Action research is a research design conducted by educators to solve the problems encountered in a school. The most distinctive aspect of this study is that it can be carried out by the problem solvers (Greenwood & Levin, 2007). When an external researcher participates, he/she takes the role of facilitator for defining and solving the problem (Marshall & Rossmann, 2006). Although it is considered as qualitative research design, it can also include quantitative data collection and analysis. The reason for being considered as a qualitative research design is that it works with small groups in a school or classroom. Those in the group define the problem, act to solve the problem, evaluate how effective the action is, and repeat these steps if the problem is not solved (O'Brien, 2001). Action research is close to learning by doing through this aspect (O'Brien, 2001). Action research enables teachers to collect convincing data and authorize them to implement the results (Gay, Mills & Airasian, 2012). The main purpose of the action research is the improvement of educational practices (Köklü, 2001), and it is frequently used to ensure the professional development of teachers (Cohen, Manion & Morrison, 2007; Norton, 2009). In many countries, teachers are supported to conduct action research (Ekiz, 2009).

This study can be considered as action research, for it includes the teachers who encounter problems and solve their problems by employing action plans. Conventional educational research generally gathers data on related problem then offers actions to solve the problem and leave the problem unsolved. Instead, this study actually solves the professional development problems of teachers.

Action research can be done by teachers alone or with the help of other teachers, students, and academics (Yıldırım & Şimşek, 2008). Techniques such as interviews, observations, experiments, case studies, and surveys can be used in action research (Köklü, 2001). The aspect of action research that differs from other research is that the researcher himself uses the data collection tools which he has developed himself (Fraenkel, Wallen & Hyun, 2012). Teachers who are directly involved in the research are stated to apply the developed action plan without any resistance (Aksoy, 2003). Teachers were found to have a direct and measurable increase in student achievement when they were involved in action research (Reeves, 2008).

The research was conducted as experimental action research. The experimental action research follows in the footsteps of Popper (1945), who argued that all social research should be conducted as experiments. Kurt Lewin, who is considered to be the founder of the action research, also designed action research in the form of social experiments (Trist, 1976). Lewin's research was mostly in the form of quasi-experimental and field experiments (Adelman, 1993). Some studies in the literature also include the phrase 'action research experiment' (Burgoyne, 1973). There have also been some people who have stated that action research is actually quasi-experimental research (Krishnaswamy, Sivakumar & Mathirajan, 2009). Therefore, it can be said that there is an experiment in the center of action research (Clark, 1976). However, the aim of using the experimental method in action research is not to reveal cause and effect relations as in purely experimental research, but to deter-

mine actions that lead to positive change (Gray, 2004). The basis of this is the reflection theory, which includes testing the hypotheses about the action of Schön. The action research carried out for this purpose reveals the experimental process with the conscious reflections made to learn the actions that lead to positive change (Friedman & Rogers, 2008).

The steps proposed by Fraser (2007) were followed to ensure teacher professional development. What the researcher has done in the framework of these steps is explained below:

1. Determination of teachers 'professional development problems: In the first step of the action research, interview technique was used to determine the opinions of teachers and school administrators about the problems of teachers' professional development.

2. Gathering data for the identification of the professional development levels of teachers: In this step, the teacher Professional Development Student Assessment Scale has been applied to the students who volunteered. The researcher completed the observation form of the researcher by observing the teacher's lesson.

3. Providing feedback to teachers about the answers: The data obtained with the forms were analyzed within a day or two. One-to-one and face-to-face interviews were held with the teachers at a time appropriate to their schedule. The researcher introduced the individual action plan draft to each teacher and explained the dynamic approach factors to the teachers. After the teachers understood the factors, the results of the analysis of the data obtained in the first step were shared with the teachers.

4. Reflective thinking on feedback: Teachers were asked to express their views on the results. The researcher discussed the results with the teachers based on their observations and the opinions of the teachers. The researcher introduced the reflective thinking steps (evaluation, reflection, solution) to the teachers and told the teachers how the action plan should be prepared according to these steps. Teachers were asked to prepare their action plans, but the teachers stated that they wanted to prepare the plans when they were alone. Teachers were given a few days of their time, and they were given an appointment to discuss them again at a suitable time. When they were re-interviewed, it was checked by the researcher whether the teachers completed their action plans in accordance with the reflective thinking steps. It is explained to the teachers how they should behave in the next process.

5. Intervention to improve the professional development levels of teachers: Teachers are given a two-week period to teach their lessons according to the action plans they prepare.

6. Re-determination of the professional development levels of teachers to determine whether the intervention is effective: The procedures in the first step were repeated after two weeks. However, the students were asked to evaluate their teachers in the last two weeks. In addition, students who are not in the first step of the class are not allowed to evaluate.

Setting

The research was carried out in a middle school in the city center of Artvin in the Black Sea Region of Turkey. The reason why this school is preferred is that the level of professional development of teachers in the school is not sufficient during the development of the teacher professional development student assessment scale. The criteria to determine whether the level of professional development of teachers is sufficient or not were the five-point Likert ranges (1:1.00 – 1.79, 2:1.80 – 2.59, 3:2.60 – 3.39, 4:3.40 – 4.19, 5:4.20 – 5.00). Therefore, the schools in which teachers were below the highest range were considered insufficient. The school is a middle school located in a busy location of the city center, with sufficient physical conditions, and mostly from the middle and middle-lower socioeconomic levels of the children of families. The school has 30 classrooms, 52 teachers, 682 students, science lab, computer class, a conference room, and a library. Class sizes range from 18 to 27. The action research was conducted in the 5E, 6B and 7E classes in the 2016-2017 academic year. The classes were selected randomly as the basis that they are from different grades.

Participants

In this section, information about the teachers, students, administrators, and researcher is presented.

Teachers, students, and administrators

In order to answer the first question of the study, teachers and administrators working in high schools and middle schools in Artvin city center were selected according to the purposeful sampling method. According to the maximum diversity technique, the teachers had as many different branches as possible. In these schools, 16 teachers and school administrators working in the 2015-2016 academic year took part. The types of the schools where the interviews were conducted, and number of participants are presented in Table 1.

Two of the schools are middle schools, one is science high school and the other two are Anatolian high schools. A total of 1508 students were studying, 108 teachers and 18 administrators were working in the schools. The interviews were conducted with 11 teachers and 5 administrators. Table 2 shows the features of the participants.

Table 1. *The schools and the participants*

School Type	Students	Teachers	Teachers Interviewed	Administrators	Administrators Interviewed
Middle School	124	8	1	2	1
Middle School	300	23	3	2	1
Science High School	340	26	4	4	2
Anatolian High School	385	26	1	4	1
Anatolian High School	359	25	2	4	0
Total	1508	108	11	18	5

Table 2. *Features of the participants*

	Duty	Gender	School Type	Total Seniority	Administration Seniority	Branch
1	Teacher	Female	Middle School	8	0	Mathematics
2	Teacher	Female	Anatolian High School	3	0	Foreign Language
3	Teacher	Female	Middle School	16	0	Guidance
4	Teacher	Female	Middle School	5	0	Foreign Language
5	Teacher	Female	Anatolian High School	6	0	Mathematics
6	Teacher	Female	Middle School	4	0	Turkish
7	Teacher	Female	Anatolian High School	5	0	IT
8	Teacher	Female	Science High School	5	0	IT
9	Teacher	Female	Science High School	4	0	Foreign Language
10	Teacher	Male	Science High School	2	0	Biology
11	Teacher	Male	Science High School	4	0	Guidance
12	Principal Asst.	Male	Science High School	5	2	Physics
13	Principal	Male	Middle School	10	4	Classroom
14	Principal	Male	Middle School	10	2	Sports
15	Principal	Male	Anatolian High School	21	11	History
16	Principal	Male	Science High School	20	13	Literature

5 of the participants were school heads and 11 were teachers. 7 of the participants were male and 9 were female. Six of the participants worked in middle school, 4 in Anatolian high schools and 6 in science high schools.

In the action research, it is necessary to work with different participants to reach different data sources and to diversify data (Phillips & Carr, 2014). For this reason, teachers, students, and the researcher were among the participants. Since the researcher had experience in teaching science and technology, the aim of the research was discussed with six science and technology teachers working in the middle school where the research was conducted. Three teachers who wanted to participate voluntarily at this stage were among the participants of the study (Table 3). It is important that participants voluntarily participate because of the nature of action research based on cooperation (Somekh, 2006). The reason for working with a small number of teachers is to raise the concern of solving problems in a narrow context instead of generalization (Fraenkel, Wallen, & Hyun, 2012).

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Three of the classes taught by the volunteer teachers were selected randomly by the researcher and students studying in these classes participated in the study. Classes are selected from different grade levels (such as 5, 6, 7).

Table 3. *Characteristics of participants of the action research*

	Code Name	Gender	Grade	Classroom Population	Seniority
1	Ayla	Female	5	20	10
2	Fahriye	Female	6	18	22
3	Zeliha	Female	7	21	19

Researcher

It is important that teachers cooperate with academicians (Korkmaz, Şahin, & Yeşil, 2011; Newman, 1994). For this purpose, it is not possible for the researcher who participates in the action research to collect data in a short period of time. The researcher must experience the same environment with the participants, become partners in the problems and become an internal stakeholder of the school. Therefore, it is important to explain the experiences, competencies and the role of the researcher.

The researcher involved in action research has a bachelor's in science teaching. He worked as a teacher in the Ministry of National Education for two years. During his postgraduate studies, the researcher has taken courses on research methods and scientific ethics. The researcher, who has taken part in various research which is designed with quantitative, qualitative and mixed methods, has a special interest in teacher professional development and intensifies his studies in this field. The researcher, who conducted qualitative and quantitative research in the middle school where the research was conducted, had the opportunity to recognize the physical and social environment, culture and employees of the school. The researcher, who observes the teacher candidates in the teaching practice classes, has guided them in effective teaching.

The main roles undertaken by the researcher in the action research process can be summarized as the observation of the teachers' lessons and the evaluation of the students about their teachers. In addition to these roles, the role of the researcher in explaining the school and classroom environment, motivating and directing the teachers and informing the administrators about the research process at regular intervals. In addition, the researcher undertook roles such as storing the data obtained, hiding the names and special information of the participants and obtaining permissions for the research.

Data Collection Tools

In this sub-section, information about interview forms, teacher professional development student assessment scale and researcher observation form are included.

Interview forms

Semi-structured interview forms were created by the researcher to answer the first research question. The form was finalized by the evaluation of five experts in the field of educational administration. The interview forms include 9 open-ended questions for teachers and 7 open-ended questions for school administrators. These questions are presented in the results section.

Teacher professional development student assessment scale

The aim of the scale is to determine the perceptions of middle school and high school students about the teaching activities in the classroom. It was developed by Bayrak and Bozkuş (2016). During its development, data were collected from 832 students who are 340 males and 492 females from grades 5 to 12 in Artvin province. Teacher professional development student assessment scale is a data collection tool consisting of 27 items under 7 factors and can explain 62.90% of total variance. The Items are scaled in five-degree Likert type. Cronbach alpha reliability coefficients of the factors ranged from 0.66 to 0.83. Factor loadings of the items vary between 0.47 and 0.82. The construct validity of the scale was confirmed by confirmatory factor analysis. The form measures the teaching-related characteristics that can determine the professional development level of the teachers from all branches.

Researcher observation form

The observation form developed by Creemers and Kyriakides (2012) was used to determine the professional development needs of teachers according to the researcher's opinion. The form allows teachers to observe classroom instruction according to the factors of the dynamic approach. The form allows the researcher to determine the qualifications that the students cannot distinguish. There are 55 items in the form. These were answered by the researcher in their original English form.

Data Collection

For all stages of the study, permissions were obtained from Artvin Provincial Directorate of National Education. Semi-structured interviews were conducted in order to get the opinions of teachers and school administrators. The deep and comprehensive data from the participants with semi-structured interviews could be collected without adhering to specific patterns (Seidman, 2013). Semi-structured interviews are extremely useful in revealing details about a case (Esterberg, 2002). When the participants simply express their views about the case, the researcher can reveal the details of the opinions by asking them new questions. The interviews were recorded with a voice recorder, then typed on the computer and checked to the participants. The total duration of interviews with school administrators lasted 141 minutes and 42 seconds. The total duration of interviews with teachers is 174 minutes and 3 seconds.

The principle of volunteerism was observed in the application of forms to students. The administrators of the applied schools were informed about the research, explained the details of the research steps to them, and preliminary interviews were conducted in order to reveal the most appropriate time for the research. The students were guided by one-to-one guidance when filling the forms in their classes. The researcher observed the teachers' lessons for 6 hours and answered the researcher observation form.

Analysis of Data

The length of the records of the interviews that were transferred to the computer was 42 pages. Inductive-based content analysis has led to extensive analysis units of meaningful analysis of important expressions and detailed explanations of what people experience. Similar explanations were put together to create themes. The means of the students' and the researcher's responses to items and factors were calculated. Dependent groups *t*-test was used to revealed statistically significant differences between first and last test means.

Validity and Reliability

In conducting the action research, the principles stated in the literature were taken into account for the validity and reliability (Merriam, 1998; Shenton, 2004). As in qualitative research, non-generalizable results for a particular context are obtained through action studies, and the measures taken for validity and reliability are similar to qualitative research. Therefore, it is considered important to ensure that credibility, transferability, trustworthiness, and verifiability are met in action research (Lincoln & Guba, 1985). Credibility is the response to internal validity in quantitative research. Collecting data from different sources, benefiting from different evaluators and having a long time in the research environment provide credibility (Lincoln & Guba, 1985). The researcher fulfilled the condition of providing credibility by collecting the data based on the student, the teacher, and his own observations, providing the evaluation of the data by different people and observing for many days in the classroom. The transferability, which is the external validity in the quantitative research, is to allow similar conclusions to be reached in studies conducted under similar conditions with a detailed explanation of what has been done (Lincoln & Guba, 1985). For this purpose, the researcher reported every step taken in the process in detail and made detailed descriptions of the environment of the school and the classes in which the research was conducted. The qualitative counterpart of reliability is trustworthiness and the fact that the data obtained due to the constant change of the context reflects the truth to be consistent with change (Lincoln & Guba, 1985). To achieve this, the researcher used reliable data collection tools and recorded the interviews with a voice recorder. Reflection of objectivity on qualitative research, when expressed as verifiability, means that the researcher has expressed his personal judgment that may affect objectivity and that the data collected from different sources validate each other (Lincoln & Guba, 1985). Therefore, the researcher compared whether the data based on students, teachers and their perceptions were consistent with each other. In order to ensure internal validity, the data were reviewed, and the breakdown of the interviews was read to the participants and the accuracy of the data was confirmed. The real names of the participants were kept secret and the code names were used.

Results

The findings obtained in this part of the research are presented in the sub-headings according to the order of collection of data and research questions.

Findings Related to Professional Development Problems According to the Views of Teachers and Administrators

The findings of the interviews with teachers and school administrators are presented under the themes.

1. Theme: Evaluation of current professional development activities according to the opinions of teachers and school administrators

Teachers and school administrators were asked the question: "How would you evaluate existing professional development activities?" The points that teachers and school administrators consider as a problem in their current professional development activities are presented in sub-themes.

1. Sub-theme: Mere information transformation. School administrators expressed that information transfer was frequently used in professional development (*f*= 2). As a matter of fact, a school administrator thinks that those who conduct activities only transfer information and do not consider teachers. He suggests that teachers should be valued, not imposed and that their needs should be taken into consideration:

> *"So, the person who came from the ministry, came from the university, to make a transfer to the teachers, should not be in this effort: I'm going to read the text, and I'm going to finish lessons. It must be a share because they are not students. He's a teacher. He makes himself a place. So, he thinks that he has just been there to learn to share at the same time. We must take these people into consideration teachers want a freer environment and wants to have a wider time. In particular, he expects his ideas to come to their attention in one place. That's when he starts making contributions. Or someone from above will say, the teacher must do it. The system works in this way" (Osman, Administrator).*

In the opinion of the administrator, since teachers are passive in professional development, it can be said that the activities do not affect the theoretical level and practice. It was also implied that the teachers thought that the activities were organized in order not to leave them empty instead of providing their professional development. Therefore, it can be argued that the main purpose in existing professional development is not development.

2. Sub-theme: Lack of application. School administrators stated that in professional development, activities should be done in a practical way (*f*= 2). A school administrator stated that the training was not relevant because they were not practical and that the same subjects were mentioned in the training:

,

> *"Not in the form of a person getting out and lecturing. Because they're not very effective for me. From what I can see, teachers are getting out of the conference right away. Some even sleep. There is a need for practice-oriented seminars, which are a little more interesting, appealing to the eye, directly in the work. By living in person, the teacher needs to be trained in that way. The same things are spoken. I'm not an old teacher, but as I've been following for 5 years, I've been coming back and talking about the same things. Some things are being solved, but I don't see much of what is said every year. It is a bit better for new teachers, but old teachers can pass on the same things every year" (Murat, Administrator).*

According to the statement of the administrator, keeping the teachers in a passive position in the activities and explaining the subjects that did not interest them reveals that the principles of adult education are not followed. This suggests that professional development is based on necessity rather than needs.

3. Sub-theme: Efficient activities. Teachers stated that their professional development activities were full of inefficient processes (*f*= 9). For example, a teacher expressed his opinion as follows:

> *"Absolutely useless. Because nothing is done. And now something happened; everyone's going to be in his home city, for example. Here I am from Trabzon. I went on a ride. I went to my previous school. We sat with my teachers, drank tea, drank coffee. That's it. There's nothing! There's nothing to tell. National Education has some issues identified. We need to develop ourselves in those matters... I can clearly say; we ate cake, burrito, tea. So that's it. Nothing else was done. Formalities have been filled in, but the formality. Completely formalism!" (Sude, Teacher).*

It is understood from the opinions of teachers and administrators that professional development activities are done because they must be done. For this reason, activities are not organized according to teachers' development needs and teachers are not interested in activities. Moreover, it is worrisome that a teacher has not even performed an activity and that the time has been spent in conversation.

4. Sub-theme: Lack of planning. A school administrator complained about the lack of planning in the current practice and stated that the activities should be given by experts:

> *"Is it useful? It's not useful when we look back. Maybe because it's not a very good plan. It is efficient if it is started with good planning. Not efficient. The Ministry is sending out general frameworks. School bureaucracy cannot be efficient in this respect, as the school administrations do not clarify the boundaries and do not clarify the issues. The reality of the work needs to be concretized in terms of a planning condition and issues. Three days this subject or 4 hours to be processed in this thread. And in the format of the seminar, people need to have some academic knowledge. In this sense, we think that cooperation with universities is a must." (Fatih, Administrator).*

It is understood from the opinion of the school administrator that the content of professional development activities is not clearly stated. This may be because teacher needs are not taken into account. In addition, it is a contradiction that the people who will tell about the activities are not experts. Because it is seen that teachers who need professional development are accepted as experts.

5. Sub-theme: Lack of effectiveness in distance education and professional development. The development of professional development activities through distance education was criticized by the administrators (*f*= 4) and the teachers (*f*= 8). A school head claimed that face-to-face communication needs of teachers were dominant, and thus distance education was ineffective:

"Our Ministry has tried a period of distance education. The program came in last week. A large part of the service is distance learning. Distance learning is, of course, useful if they are sincere. Because there are specialized people. There is a little looseness in our education community and teachers in this regard. He will see the living person in front of him, maybe a little more effective. So, in distance education, the goal is good but the result doesn't match the goals or objectives" (Fatih, Administrator). It is understood from the interpretations of teachers and administrators that distance education applied in professional development is a one-way transfer and therefore does not include two-way communication. The necessity of bidirectional communication in education is expressed. It can be understood that distance education is done only by teleconference. However, there are methods and techniques that provide two-way communication which can make teachers active in distance education. One of these methods and techniques is to propose a teacher to discuss a sample lesson by referring to microteaching.

6. Sub-theme: Non-consideration of professional development needs. One teacher stated that they were asked about their needs in preparing their professional development activities, but then their needs were not taken into consideration:

> *"A survey is conducted at the end of the year. But they do it on their own. For example, at the end of the year, we had to criticize the books, for example, they want things. We say that in this book, these are ..... the words we have. But they never consider them" (Funda, Teacher).*

The training which can affect the teaching of teachers in the professional sense is named as the seminar. However, participation in these seminars is not according to need but according to seniority.

According to the teachers and the administrators, professional development is imposed as a right rather than need. The most important reason why the problems mentioned in the previous comments, the indifference of the teachers and, consequently, the inability of professional development to be effective, maybe the lack of consideration of teacher needs.

If the findings obtained in this theme are summarized, the needs of the teachers are not taken into consideration as the professional development is not seen as a need, and therefore the real purpose in the professional development is not development. As a result, it can be understood that professional development must be done and teachers' participation in professional development is seen as a right offered to them. It can be argued that the content of professional development activities is not clearly stated, the activities are carried out by non-experts and the lack of bidirectional communication of distance education applied in professional development is not compatible with the dynamic professional development approach.

Theme 2: The barriers that teachers face when providing professional development

Teachers are asked the question "What barriers do you encounter while providing your professional development?". The obstacles that teachers face while providing their professional development are presented in subthemes. It was determined that the opinions about the obstacles that teachers encountered while providing their professional development were concentrated on personal barriers (f = 4), family obstacles (*f*= 2) and obstacles related to city facilities (*f*= 2).

1. Sub-theme: Personal barriers. A teacher because of the intensity of his life commented as:

> *"But because I'm very busy at school this time, I can't follow because of the intensity. I've been following Primary Education Online magazine very often. I was reading new articles especially about my field" (Sude, Teacher).*

Some teachers also stated that they did not take time for professional development because of their personal indifference. For example, a teacher; I can't follow academic journals in the last year. It's obviously me. I'm not really getting along. I can spare time if I want" (Sevim, Teacher) has expressed their views. Another teacher; "I don't follow any education-related journal. But I wish. I do not follow the new books about the profession. I cannot say that I read a book about teaching specifically" (Buket, Teacher) stated that this issue remained indifferent.

One of the teachers explained that she did not attend the training because she was prejudiced against in-service training. "I don't think they're addressing me. I didn't go, but I don't think it's very efficient. Smartboard discusses. There's this one down here, that's it, okay. Since it is not efficient, I do not go to the in-service training" (Aslı, Teacher). It can be understood from the teachers' comments that they are not willing to participate in professional development and therefore produce excuses. Teachers' lack of willingness may be due to the problems mentioned in the previous theme. Because of these problems, professional development is not helpful to teachers, it may have prevented teachers from motivating to participate in professional development and provided them to behave in a prejudiced way.

2. Sub-theme: Family obstacles. Female teachers stated that they could not improve themselves due to their family obligations. For example, a female teacher; "I was able to keep up with the latest publications when I first started. But I cannot really follow up with the marriage of being a woman over time. To be honest" (Funda, Teacher) stated that the change in marital status was an obstacle.

Responsibilities of marriage and having children in Turkey are mostly undertaken by women. Therefore, female teachers have difficulty in allocating time for their professional development.

3. Sub-theme: Obstacles related to city facilities. Some teachers have expressed the limitations of their city. A teacher on this subject;

> *"In order to improve my profession, for example, only if I were in a metropolitan city, I cannot develop myself in Artvin. There are symposiums of universities. Special courses are open, for example, there is a study about different activities and new topics. But we can't participate... I want to improve myself. But I cannot participate because the circumstances are not available" (Tuba, Teacher).*

A teacher explained that his effort to participate in a symposium in his field was prevented by the provincial national education directorate as follows:

> *"I joined a symposium. But the National Education did not let me join. I had a symposium on children's literature with my wife, and we wrote a paper on it. They didn't let us directly. We could go through the health report. In this respect, I am complaining about National Education. They won't let me. Just because it's international, they're not allowed. If they were at a university level, they would've written. I mean, if it's national and if it's close. Ours was in Istanbul. That's why they didn't let me. They told me to get a health report directly. So, I got a report." (Funda, Teacher).*

Since it is difficult to get around in Artvin, teachers have difficulty in participating in professional development opportunities in the city. For this reason, the provincial national education directorate did not want to send the teacher to the event outside the city. However, the directorate should have been more understanding to overcome this obstacle. Moreover, the ministry has a legislative arrangement for the participation of teachers in extra-urban activities.

According to this theme, it can be said that teachers are not interested in professional development, female teachers are forced to participate in professional development and that the possibilities of the city where teachers work can hinder their professional development. But these barriers are not obstacles that cannot be overcome. Measures to overcome the obstacles in the title of the recommendations of the research are indicated.

3. Theme: School administrators 'efforts to support teachers' professional development

The school administrators were asked the question "What are you doing to ensure the professional development of teachers?" The efforts of administrators to support teachers' professional development are presented in subthemes.

1. Sub-theme: Make an announcement. School administrators stated that they could not go beyond the announcement of the existing training (*f*= 5). A school administrator stated that they have no other choice but to announce the existing training as they are not educated about teachers' professional development:

> *"We, as I said, are making the announcements. There's that training down there. The training is not only in other provinces. There are courses offered by National Education. For example, there is an occupational safety course. Recently, all the teachers joined him. Then the seminars in the province, sometimes in schools in the form of in-service training. We are not specially trained managers, specially trained people. We are not going to say a certain lesson to the teacher in professional subjects. Courses in this field bring experts and open courses in the school. It opens in the Directorate of National Education. We're going to the halls. That way we are trying to help" (Murat, Administrator).*

The training, which the administrators describe as vocational development courses, are more like the courses offered by the public education centers within the scope of lifelong learning. It is understood from the statements that administrators did not receive training on teacher professional development. While the first administrator accepted this, according to the statement of the other administrator, it is seen that professional development is not fully known. Therefore, administrators cannot contribute to the professional development of teachers.

2. Sub-theme: Sharing experience. A school head stated that he could not go beyond sharing experiences with teachers and assisting them when necessary;

> *"The teachers' board is an educational institution for everyone. There is very broad information is shared, experiences are spoken. The biggest contribution of the board is that we have friends from different schools. Our friends who want to come as much as they want from the school or school about the applications related to the subject, we take notes. This is an education, but as a more systematic education, we are constantly trying to send our friends to in-service training. From the Ministry of National Education, we demand that our teachers be systematically trained as much as possible. In fact, the ministry is not sufficient in this regard but has an effort and work" (Osman, Administrator).*

He stated that professional development activities for teachers consist of knowledge and experience sharing within the school and in-service training outside the school. In addition, the same school administrator said that they would not be able to go beyond assisting teachers and give teachers one-on-one training because they are in the same position as them.

It is important to share experience among teachers as the administrator states. Thus, the solution of problems related to practice can be learned from peers. However, professional development is a wider concept than sharing experience. According to the findings obtained from this theme, it can be said that school administrators did not receive training on professional development and could not go beyond teaching and sharing experiences with teachers. Therefore, it is very limited that administrators contribute to the professional development of teachers.

4. Theme: Teachers' views on how professional development activities should be done

The teachers were asked the question "How would you like the professional development activities to be done? The opinions of teachers about how professional development activities should be done are presented in sub-themes.

1. Sub-theme: Must be application oriented. A significant number of teachers (f = 8) stated that professional development activities should be practical. An example of a teacher's response to this situation is the following:

> *"It needs to be practiced. Not in the style of a seminar, not like a course at a university, but at the university, we learned a lot about it, but it would be better if we were taught something different than what we saw at the university. For example, we participated in things here, we attended seminars at the time we were interns. For example, the seminars there were not very useful. Because we have not been told anything other than what we know. The information was given theoretically but there was nothing based on practice. So, it was no different from the information we saw at the university" (Nurcan, Teacher).*

Teachers do not want to be passive in professional development. They do not find it useful only to transfer theoretical knowledge to themselves. Because the theoretical knowledge that they already know and have no value in practice may not arouse a desire to learn in teachers who are in practice. Unlike pre-service training, where theoretical knowledge is intense, practice-oriented training in service may attract more teachers' attention.

2. Sub-theme: Should be directed toward problems. A teacher has argued that professional development activities should be prepared according to the problems faced by teachers:

> *"Everyone has a lot of problems in school, in a year, and it's time for everyone to sit through the problems and tell everyone the problem, and the opposite has to be well equipped so that I suggest you do that, I think we can start the next year better. So, I think the problem should go through. Take any subject. I may or may not meet him in a year. If the problems go through, if there is a very equipped person in front of me, I think it will be that way" (Aslı, Öğretmen).*

The emphasis of the education on the problem is consistent with the emphasis on approaching the practice and moving away from the theoretical and professional development in the previous sub-theme. Because emphasis on the teacher in the classroom needs information that works.

According to the views in this theme, it can be said that teachers think that the gap between theory and practice should be closed through professional development. In order to close this gap, reflective thinking can be used in professional development. With the reflective thinking technique used by the dynamic approach, solutions can be produced for the problems faced by the teachers in practice. Thus, professional development can be provided as stated by teachers in this theme.

5. Theme: Teachers' views on what areas they need professional development

The teachers were asked the question "In which areas do you need professional development? Findings of teachers' needs for professional development are presented in sub-themes.

1. Sub-theme: Classroom management. Some of the teachers (*f*= 3) found themselves inadequate in class management. For example, a teacher stated that she needs professional development in the field of classroom management: "In classroom management, of course, like every teacher. Because every method is clogged. Sometimes the child's world is different, even if you behave well. There may be a problem at home. You can't communicate (Buket, Teacher).
Similarly, another teacher stated that she experienced problems in the field of classroom management: "I need it in terms of classroom management. The behavior of children in classes is changing day by day. In other words, 5-6 years ago, there are fewer problems in terms of classroom management" (Funda, Teacher).

The rapid change in the world reveals new generations every 5-10 years. As a result, the behaviors of students in the classroom vary from year to year. Teachers have to keep up with this change. The way to this is also through professional development. The dynamic approach that focuses on the teacher's classroom behavior can be a solution to this problem.

2. Sub-theme: Measurement and evaluation. A teacher needs support in the field of measurement and evaluation;

> *"We are preparing the exam, yes, but we prepare with our information in KPSS [teacher selection exam]. For example, we saw a measurement course. In the exam, there should be a multiple-choice question and we should have an open-ended question. But I don't know if we can do that. But it would be great if there was any support in this regard. But there isn't" (Metin, Teacher).*

Metin states that new information has not been put on the pre-service information in the field of teacher measurement and evaluation. The importance of professional development is better understood here. Teachers may not be sure of the correctness of their practice when they do not have effective professional development.

In this theme, teachers stated that they need professional development in important areas such as classroom management and assessment. In addition, it can be said that teachers need practical information in these areas. This is consistent with the previous findings. Therefore, it can be said that teachers need professional development for classroom practices.

6. Theme: Teachers' and administrators' views on how teachers should be evaluated

The following questions were asked to teachers and administrators: 1) Who do you think is appropriate for the evaluation of teacher performance within the class? Why? 2) How do you find the observation of the classes by the school administrators? 3) What are your opinions about the evaluation of the teachers by an observation form? Teachers 'and administrators' opinions about who should be evaluated by teachers are presented in sub-themes.

1. Sub-theme: Evaluation by students. A significant number of teachers (*f*= 9) argued that students could evaluate themselves. A teacher has found it appropriate to evaluate students who are primarily affected by their work:

> *"If I do my job to whom, whom I am telling: Students. Students need to criticize, of course. Because they see me first. I don't think it's efficient for someone to do that by listening to how I teach. That's why I think the student's direct criticism will be improved more. Surveys, of course. We were doing it in college. Not a problem for me. I would like to see this: frankly, the student was there with points, for example. If I see that I'm missing in there, what do I try to do there myself? In the future or at another time, I try to improve myself, and I'm even better interested" (Banu, Teacher).*

The administrators considered the teachers' evaluation by an observation form as positive but with some reservations (*f*= 3). A school administrator stated that the assessment could be successful, provided that the assessment was carried out professionally:

> *"I think it would be nice. However, these surveys will, in the midst of the teachers, travel around the school and be implemented. In other words, the mechanisms that will prepare these surveys should act very professionally. Very skillfully, preparations must be made in accordance with the spirit, purpose and purpose of the work in" (Osman, Administrator).*

Teachers and administrators were positive about students' evaluation of teachers. However, it is understood that administrators approach this issue from a different perspective. This may be the result of a broader view of administrators by their position. As a matter of fact, the administrators stated that the hierarchical structure in the school should not be spoiled.

2. Sub-theme: Evaluation according to the results of the central exam. A school administrator to evaluate the professional development of teachers stated that the YGS and LYS examinations by which students are assessed should be taken into consideration:

> *"The written results of that class are not a criterion but certainly an outcome. Let's consider that, if a student's mathematics goes over 90 for over four years, and over 80, and our student is doing 2-3 questions in math's at YGS, there is definitely a mistake in one place. This is the basic criterion! Perhaps, as I said, feedback from our parents or students is not effective in the success of a teacher. The administrative convictions are not enough. The only formal criteria are the results of YGS and LYS" (Fatih, Administrator).*

The school director only advocates the evaluation of teachers according to the results of the central examinations. In the evaluation, the process may be neglected and only drawbacks may be the focus. Because the process is the result. The mistakes identified during the training process can be corrected immediately. However, if the assessment is made according to the results of the exam, the correction of the mistakes will be delayed and the students who failed in the examination may have been dismissed.

3. Sub-theme: Multidimensional assessment. Another school administrator argued that the success of the student was not the only criterion;

> *"At the end of the school year, in the middle of the year, some such performance indicators should be developed, and the system should be evaluated first. So, we have to look at the resulting product. As a matter of fact, if the good teacher has caused the positive behaviors of the students, if the discipline of the class is instrumental to the class, the children of the class, so if the school is reflected in the academic success of teachers. Of course, we cannot evaluate everything with academic achievement or indicators related to education. We need to look very versatile. The teaching of a teacher is the classroom management, the discipline that he gives to his students, the moral values, the dialogue he has developed with them, the progress in the academic success of the children, the warm relationship that the school establishes with the environment on the occasion of the teacher" (Osman, Administrator).*

The school administrator argues that teaching cannot be evaluated merely in terms of teaching academic success and that the outcomes of education should also be evaluated. While many such assessments may be useful, they have not gained prevalence since they have difficulties in practice.

4. Sub-theme: Evaluation by school administrators. It can be said that school administrators are aware of the fact that course observation is already a part of their duties, but they do not consider it appropriate. A school head expressed this situation as follows:

> *"This is in the regulation. We have to do it at least once a year. But so far, 10 years in the past, and this has been my work once in my teaching life. I also followed the courses of our trainee teachers for two years. In this sense, I do not find too ethical a manager to go and listen to the teacher's lesson there to draw conclusions about the teacher" (Fatih, Administrator).*

Most of the teachers (*f*= 7) opposed to being observed by the administrators in the classroom. A teacher described the observation as disturbing in the following words:

> *"The principal has already observed me in the first year of my profession. I was very upset. I mean, even though one of my parents walked into my class and watched, it bothers me. I can't be comfortable. I can't handle the lesson as I said. Okay, let him come or watch the camera. It doesn't matter, but something won't change. Let him come, but worse than normal, we can handle more stress. I think it makes me uneasy to have a person, that's all!" (Aslı, Teacher).*

Another teacher emphasized that the observer should be more experienced than herself:

> *"I don't like it. Because I ask him how many years he spent in class. How many years did you spend in class? How many times have you gone through the stages I've been through? I mean, a person needs you to be able to evaluate you. From the student's point of view, it is separate. The student understands or does not understand the course. Because criticism is something that comes from experience. Can I get up now and criticize the teacher of 20 years? I consider this to be rude" (Buket, Teacher).*

Another teacher preferred an inspector to make observations in the classroom because the principal might be biased:

> *"I prefer the inspectors to come. Let them come. Because if you clash with the manager, there is a situation. But the inspector doesn't know you. He must be neutral. But if you're in conflict with the administration, I'm not saying that in the name of myself, but I'm trying to think of multidimensionally, then it doesn't evaluate you! Evaluates with prejudice. That's exactly what you do, and you'd be surprised. Because if he wants to find a fault, he will find it. The important thing is how to turn off the defect" (Sude, Teacher).*

School administrators stated that they had neglected the lesson observation because they did not find observing as right. They argued that it was unethical to observe senior teachers as a rationale. A teacher's evaluator has to be more senior than him that his opinion may be adopted by teachers. Although the teaching experience is important, the fact that the administrators did not receive training on course observation may have played a role in this finding.

Teachers stated that they do not want to be evaluated by the school administrator. They presented as the reason that administrators are not senior enough, they can act with bias and may make teachers anxious. The views of teachers and administrators are consistent with each other.

According to the opinions in this theme, it can be said that teachers and school administrators have positive attitudes towards students' evaluation of their teachers. The fact that student assessment is a form of assessment applied in the world contributes to the validity of opinions. According to the dynamic approach, student evaluation can be used in teacher professional development.

Findings Related to Teachers' Professional Development Level According to Students

In this section, data collected from 832 students using teacher professional development student assessment scale are analyzed. The averages of the teachers who work in the schools where the scale is applied according to the students' perceptions of the dynamic approach are presented in Table 4.

Orientation (*M*= 3.92, *sd*= .92), structuring (*M*= 3.78, *sd*= .84), questioning (*M*= 4.13, *sd*= .78), teaching modeling (*M*= 3.94, *sd*= .95), application (*M*= 3.68, *sd*= .95), the classroom as a learning environment (*M*= 3.87, *sd*= .81) and assessment (*M*= 3.37, *sd*= .91) behaviors are frequently performed. In addition, questioning behaviors are almost always done. According to the findings, it can be said that teachers are generally less than 4.20 in all factors. Therefore, it can be claimed that teachers need professional development in all factors. In addition, it can be said that the most need for development is in the sixth school.

Findings on improving teachers' classroom instruction according to students and researcher
In this title, the data collected by teacher professional development student assessment scale and the data collected by the researcher were analyzed (first test). Then the findings of the analysis of the forms answered by the students and the researcher (final test) are given.

The findings regarding the evaluation of the teachers' professional development levels according to the factors of the dynamic approach by the students and the researcher are examined in Table 5.

Table 4. *Evaluations of students about professional development levels of teachers*

School	Orientation	Structuring	Questioning	Teaching Modelling	Application	The Classroom as a Learning Environment	Assessment
1	3.64	3.49	3.88	3.67	3.54	3.37	3.18
2	4.30	3.99	4.33	4.18	3.95	3.83	3.70
3	3.90	3.85	4.16	4.08	3.66	4.16	3.21
4	4.04	3.88	4.24	3.92	3.89	3.98	3.58
5	4.61	4.29	4.64	4.53	4.44	4.51	4.14
6	3.50	3.50	3.87	3.56	3.11	3.70	2.99
Total	3.92	3.78	4.13	3.94	3.68	3.87	3.37

Table 5. *Initial test findings*

	Ayla (5th Grade)		Fahriye (6th Grade)		Zeliha (7th Grade)	
Factors	Students (*n*=20)	Researcher	Students (*n*=20)	Researcher	Students (*n*=20)	Researcher
Orientation	4.30	4.21	3.61	3.51	3.76	3.78
Structuring	4.23	4.13	3.33	3.48	3.61	3.69
Questioning	3.67	3.68	3.41	3.65	3.50	3.62
Teaching Modelling	3.91	3.21	2.35	2.57	3.49	3.64
Application	4.40	4.63	3.05	3.40	3.38	3.58
The Classroom as a Learning Environment	3.19	3.26	2.85	2.23	3.09	3.48
Assessment	3.92	3.45	3.43	3.40	3.04	3.52

According to the findings, two teachers (Fahriye and Zeliha) were found to be low on all factors, while the other teacher (Ayla) was low on four factors.

After evaluating the findings related to their teaching, teachers reported their ways to meet professional development needs and developed their action plans as:

> *"I will relate the necessity of subjects to everyday life by giving more concrete examples,*
> *I will begin by saying what we will do at the entrance of the course, paying more attention to finishing by learning what we learned at the end of the lesson,*
> *I'm going to try to ask my questions in plain language,*
> *I will encourage my students to solve more problems and encourage them to find individual solutions,*
> *In the classroom, I will try to get more time for individual and group work,*
> *I will review my class rules and look for ways to improve myself,*
> *I will try to give more feedback to my students" (Ayla).*

> *"I will emphasize the objectives of the course more*
> *I will spend more time starting with the course review and summarizing the main points at the end of the lesson,*
> *I'm going to try to ask my questions in plain language,*
> *By encouraging my students to solve more problems, I will direct them to find new solutions,*
> *I will try to give more feedback to my students" (Fahriye).*

> *"I think it is important to inform my students about the objectives of the course when coming to the next lesson,*
> *After the course, I will give the students a brief, concise, understandable way, especially in science.*
> *After learning the subjects, I should aim to get feedback from students by asking questions,*
> *In the course, I will help students to find different solutions,*
> *I'm going to make sure that homework isn't in a boring way, but for research.*
> *I will make the course more enjoyable and I will prevent the class from boiling.*
> *I will ensure that the students will not be disturbed by the evaluations and make the evaluations enjoyable" (Zeliha).*

When the professional development levels of teachers are determined after the courses have been taught according to Ayla's action plan, the findings are compared with the previous findings and presented in Table 6.

According to the findings, it can be said that the teachers, in general, have progressed in all factors. Dependent groups t-test revealed that there are statistically significant differences in the factors of questioning ($t_{(19)}$= 4.49, p<.001, Cohen's d=1.00) and the classroom as a learning environment ($t_{(19)}$= 6.67, p<.001, Cohen's d=1.49). The effect sizes (Cohen's d) indicate that the two tests' means differ by one standard deviation for the questioning factor and by 1.49 standard deviation for the classroom as a learning environment factor. Since the effect sizes are above 0.80, they can be considered as large in size.

Similarly, the professional development levels of teachers are determined after the courses have been taught according to the Fahriye's action plan. The findings are compared with the previous findings and presented in Table 7.

It can be understood from the findings that progress has been made in all factors. Dependent groups t-test results indicate that orientation ($t_{(17)}$= 2.66, p< .05, Cohen's d= 0.65), structuring ($t_{(17)}$= 2.76, p< .05, Cohen's d= 0.67), questioning ($t_{(17)}$= 3.12, p< .05, Cohen's d= 0.76), teaching modeling ($t_{(17)}$= 7.75, p< .001, Cohen's d= 1.88), application ($t_{(17)}$= 3.60, p< .05, Cohen's d= 0.87), the classroom as a learning environment ($t_{(17)}$= 2.85, p< .05, Cohen's d= 0.69) and assessment ($t_{(17)}$ = 2.47, p< .05, Cohen's d=0.60) factors differed significantly. The effect sizes (Cohen's d) indicate that the two tests' means differ by 0.65 standard deviation for the orientation factor, by 0.67 standard deviation for the structuring factor, 0.76 standard deviation for the questioning factor, 1.88 standard deviation for the teaching modeling, 0.87 standard deviation for the application, 0.69 standard deviation for the classroom as a learning environment and by 0.60 standard deviation for the assessment factor. The effect sizes that are above 0.50 can be considered as medium and that are above 0.80 can be considered as large in size.

Finally, the professional development levels of teachers are determined after the courses have been taught according to the Zeliha's action plan. The findings are compared with the previous findings and presented in Table 8.

Table 6. *First and last test findings of Ayla*

	Ayla (5th Grade)			
	First Test		Last Test	
Factors	Student	Researcher	Student	Researcher
Orientation	4.30	4.21	4.33	4.26
Structuring	4.23	4.13	4.27	4.19
Questioning	3.67	3.68	4.18	4.25
Teaching Modelling	3.91	3.21	4.31	4.19
Application	4.40	4.63	4.45	4.70
The Classroom as a Learning Environment	3.19	3.26	3.85	3.77
Assessment	3.92	3.45	4.07	3.92

Table 7. *First and last test findings of Fahriye*

	Fahriye (6th Grade)			
	First Test		Last Test	
Factors	Student	Researcher	Student	Researcher
Orientation	3.61	3.51	4.01	3.96
Structuring	3.33	3.48	3.90	4.07
Questioning	3.41	3.65	3.88	3.99
Teaching Modelling	2.35	2.57	3.45	3.64
Application	3.05	3.40	3.88	4.04
The Classroom as a Learning Environment	2.85	2.23	3.66	3.51
Assessment	3.43	3.40	3.95	4.09

Table 8. *First and last test findings of Zeliha*

	Zeliha (7th Grade)			
	First Test		Last Test	
Factors	Student	Researcher	Student	Researcher
Orientation	3.76	3.78	4.12	4.18
Structuring	3.61	3.69	4.08	4.15
Questioning	3.50	3.62	4.11	4.05
Teaching Modelling	3.49	3.64	3.98	4.03
Application	3.38	3.58	3.99	3.86
The Classroom as a Learning Environment	3.09	3.48	3.78	3.96
Assessment	3.04	3.52	3.57	3.88

According to dependent groups t-test results there are statistically significant differences in the factors of application ($t_{(20)}$= 2.35, p< .05, Cohen's d= 0.54), the classroom as a learning environment ($t_{(20)}$= 4.34, p< .001, Cohen's d= 1.00) and assessment ($t_{(20)}$= 3.83, p< .05, Cohen's d= 0.88). The effect sizes (Cohen's d) indicate that the two tests' means differ by 0.54 standard deviation for the application, one standard deviation for the classroom as a learning environment and by 0.88 standard deviation for the assessment factor. The effect sizes that are above 0.50 can be considered as medium and that are above 0.80 can be considered as large in size.

Conclusion and Discussion

The results of this research are presented and discussed according to research questions.

The results and discussion of the findings related to professional development problems according to the views of teachers and administrators

Teachers and school administrators stated that professional development activities were not tailored to the needs. Determining teachers' participation in professional development activities based on quota rather than need may mean that teachers' needs are ignored. It is stated that professional development activities are not determined according to teacher needs in the literature (Bümen et al., 2012). In order for teachers to participate in their professional development activities and to be interested in activities, the activities should be directed towards their needs (Özan, Şener, & Polat, 2014). Activities can only attract teachers' attention and be effective if they are intended to meet teacher needs. Professional development of teachers is carried out through activities such as workshops and seminars imposed on them in western countries without considering the needs of teachers (Choy, Chen, & Bugarin, 2006; Colbert et al., 2008). Thus, activities are far from teachers' classroom practices and teachers are not interested in activities (Duffield, Wageman & Hodge, 2013). In this way, pre-determined professional development activities prevent teachers from taking steps to improve their teaching (Colbert et al., 2008; Fullan, 1995). In addition, teachers find such activities boring because they forget 90% of what they learn (Miller, 1998). If teachers are allowed to design professional development activities, teachers make efforts to improve classroom practices (Choy, Chen, & Bugarin, 2006; Gregson & Sturko, 2007; Klein & Riordan, 2009).

It was expressed during the interviews that there was no planning in the current professional development activities and only information transfer was made. It is suggested that professional development activities should be planned in advance (Balkar, 2010) and done by experts in their field (Özan, Şener, & Polat, 2014; Tonbul & Altunay, 2011). The fact that professional development activities are carried out in a way that is purely informative does not correspond to the principles of adult education (Knowles, Holton, & Swanson, 2005).

Teachers and school administrators stated that professional development activities were not practical. Teachers want their professional development to be practical because they are in practice (Özan, Şener, & Polat, 2014; Tonbul, 2006). It is emphasized that professional development activities given to teachers are based on theory, but teachers want to learn the information that can be applied in the classroom (Gregson & Sturko, 2007).

Teachers and school administrators opposed professional development by distance learning. Distance education has some advantages and disadvantages (Gündüz & Bozkuş, 2013). It is understood from the comments that the advantages of distance education cannot be exploited, and the disadvantages cannot be minimized. In addition, the activities described in the comments can be said to be made by teleconference. It is stated that distance education is a concept that cannot be done with teleconference only (Moore, 2013). In a previous study, it was determined that very few of the teachers (6.5%) wanted to participate in professional development activities through distance education (Kaçan, 2004).

Female teachers stated that they could not devote time to professional development because of their family responsibilities. The fact that women teachers cannot find time for professional development due to their family responsibilities is criticized in the literature (İnandı et al., 2009; İnandı & Tunç, 2012; Köstek, 2007). In a study in the literature, family responsibilities may have played a role in determining that female teachers' expectations for professional development are higher than male teachers (Bozkuş, Taştan & Turhan, 2015). In a previous study which supported the findings of this study, it was determined that teachers did not give enough importance to professional development (Bozkuş & Taştan, 2016). School administrators also argue that teachers do not give importance to professional development (Turan, Yıldırım, & Aydoğdu, 2012). Teachers do not show interest in professional development because they see themselves sufficient (Karacaoğlu, 2008) and do not love their profession enough (Çam & Üstün, 2016).

Teachers stated that they had limited city facilities for their professional development. Despite the support of the Ministry, a teacher stated that he could not attend a congress. It is stated in the literature that obstacles that hinder the professional development of teachers should be removed by the Ministry of National Education (Bümen et al., 2012; Gündüz, 2010). It is known that teachers' professional development needs differ according to geographical regions (Akar, 2010). School administrators stated that professional development activities consisted of sharing information and experience within the school. It is stated that the scope of professional development cannot be so narrow (Can, 2004). In addition,

according to a study, it was determined that administrators did not encourage teachers to participate in educational activities except for seminar periods (Bozkuş, 2016). The administrators stated that they could not provide close support to the teachers because they were in the same position as the teachers. The obstacles of the peer coaching approach mentioned by the school administrators are mentioned in the literature (Bozak, Yıldırım & Demirtaş, 2011). Professional development activities for teachers should give the teacher the possibility of reflective thinking as well as his / her own development plan (Darling-Hammond & McLaughlin, 2011; NAEYC, 1993). Reflective thinking becomes important in professional development as adults understand their knowledge according to their interactions with the world (Billington, 2000; Göker & Bozkuş, 2017; Williams, 2001). Professional development activities focusing on specific teaching practices increase the level of classroom practice of teachers (Desimone et al., 2002). Teachers working in schools are prone to learn by participating in socially related activities (Jenlick & Kinnucan-Welsch, 1999). Professional development can only bring about a profound change in the teaching of teachers if they are related to classroom practices and in collaboration with other teachers (Gregson & Sturko, 2007). For this reason, the teacher should plan his own professional development to learn what he needs to learn (Billington, 2000; Gregson & Sturko, 2007). Because adults are themselves responsible for their own learning (Knowles, Holton & Swanson, 2005). Therefore, it is inevitable for teachers to learn what they need to learn and if they try to teach them, it is inevitable that such a professional development approach will fail (Gregson & Sturko, 2007). In addition, teachers' having a learner-centered professional development experience can provide their students with learning-centered learning experiences (Daley, 2003). For these reasons, an ideal professional development model should be able to provide teachers with the opportunity to receive support and feedback from their colleagues through meaningful learning experiences that they can apply in the classroom (Wadlington, 1995; Wlodkowski, 2003).

The teachers stated that the professional development activities should be oriented towards the practical problems they face. It can be said that these views of the teachers are appropriate. Because, according to the literature, professional development activities can be effective when it comes to classroom teaching and the needs of teachers (Creemers, Kyriakides, & Antoniou, 2013). These views are the principles adopted by the dynamic approach. Therefore, teacher professional development can be effective when it is done in accordance with the dynamic approach. As a matter of fact, when the dynamic approach was applied in this study, the improvement of the professional development needs determined according to the factors of the approach has been achieved.

It was determined that some teachers who participated in the study found themselves insufficient in the fields of classroom management, measurement and evaluation. The classroom management needs (Akar, Erden, Tor, & Şahin, 2010; Gültekin, Çubukçu, & Dal, 2010) and assessment-evaluation needs (Küçüktepe, 2013) of teachers are indicated in the literature. According to the teachers' perceptions in a quantitative study, it was determined that the most important qualifications that an effective teacher should have are the qualifications in the field of classroom management (Bozkuş & Taştan, 2016). In addition, it was found that the level of adherence to the principles of classroom management (Gündüz & Bozkuş, 2016) and assessment-evaluation competencies of teachers working in high schools (Çakan, 2004) were lower than those of primary and middle school teachers.

The administrator observations of the teachers in the classroom were not positively interpreted by both teachers and administrators. The participants approached positively to the evaluation of teachers by students. The evaluation of teachers by students is recommended in the literature (Kane, Kerri & Pianta, 2014; Shavelson, Webb, & Rowley, 1989). Teachers do not want to be observed in the classroom by their administrators because they may be afraid of administrators to evaluate their performance (Acheson & Gall, 2003). However, one-to-one engagement with teachers is expected to stimulate professional development (Zepeda, 2003).

Teachers have preferred to be evaluated by their students. Student assessment is a common practice in the world. In western countries such as Mexico, Slovakia, Spain, and Sweden, students evaluate their teachers (Isore, 2009). It has been determined that students can effectively evaluate their teachers in research conducted in Middle East countries such as Jordan, Lebanon, and Palestine (Awartani, Whitman, & Gordon, 2007).

The results and discussion of the findings related to the teachers' professional development level according to the students

It was determined that the teachers working in the schools where the teacher professional development student assessment scale was applied were not at the desired level in the dynamic approach factors. Therefore, it can be said that teachers do not teach courses according to the dynamic approach. This may be due to teachers do not receive training on the approach. It is determined experimentally that when teachers teach according to the dynamic approach, students learn more (Antoniou & Kyriakides, 2011). In this study, the teachers were evaluated more positively by the students when they teach according to the dynamic approach. For this reason, it can be said that by adopting the dynamic approach, the quality of teaching will increase, and the students will learn better.

The results and discussion of the findings related to the improvement of classroom teaching of teachers according to the students and the researcher

It was determined that two of the teachers participating in the action research were found to be below sufficient levels in all factors, while the other teacher was found to be below sufficient levels in factors other than orientation, structuring, and application factors. It was determined that the teachers could correct the needs when they implement the action plans that they prepared by reflecting on the professional development needs to be determined according to the factors of the dynamic approach.

Some difficulties were encountered during the conduct of the action research. Video recording permission could not be obtained from the Ministry of National Education. Participant teachers did not want to record their voice with the hesitation from the state of emergency. Therefore, courses could not be recorded and structured interviews with teachers could not be realized. The data from the teachers were limited to the action plans. In order to increase the data sources to ensure credibility, the researcher made observations in the classrooms of the teachers. This situation contradicts the finding that teachers do not want to be observed in the classroom. Because of these reasons, the validity committee could not be formed with different evaluators as the qualitative data could not be collected. Participants were restricted by the researcher's teaching branch. The absence of assistants to accompany the researcher prevented the professional development of teachers from other branches. Progress has been made in the professional development of teachers despite the

difficulties. However, how the progress was achieved was limited to the solutions that teachers indicated in their action plans.

Increasing the quality of teachers takes place in a few stages. First of all, the level of qualifications of teachers in the classroom is determined. Classroom teaching factors determined by the dynamic approach according to the research results specified in the literature are determined by the students with the teacher professional development student assessment scale. According to both the teachers and the administrators participating in the research and the literature, the students can effectively determine their teachers' competencies. Because there is no stakeholder who observes teachers more than students in the classroom. The scale can be answered by middle and high school students at certain times of the academic year. According to the averages of the factors determined by the dynamic approach, points can be interpreted. Thus, teachers can be motivated by the sincerity in order to meet their professional development needs by realizing their competencies.

Teachers can take measures to determine the cause of their deficiencies by adopting the dynamic approach and through reflective thinking. Theoretical knowledge may not always be practical. There may be gaps between the theory and the application. A teacher may not be able to determine what to do in the class by just looking at a theory. It may be necessary to produce the application-oriented information that is not in theory. Reflective thinking comes into play at this point. It is called reflective thinking when a person draws a conclusion from the applications and obtains new information according to that result (Dewey, 1910; Schon, 1983). Reflective thinking is important in the professional development of teachers. Because teachers do not always find solutions to problems they encounter during the application (Sergiovanni, 1989). Since professional development activities in the traditional sense are more based on theory, it should not be considered that teachers should be provided professional development only with these activities. Because it is often expressed that such activities are disconnected from practice and cannot meet the needs of teachers (Budak & Demirel, 2003; Bümen et al., 2012). Therefore, in the professional development of teachers, teachers need to be able to produce practical information with reflective thinking method where the theory is insufficient (Gustafsson & Fagerberg, 2004; Darling-Hammond & McLaughlin, 1995; Day, 1993). In this way, teachers, by evaluating themselves and produce the information they need, to be removed from the passive situation in professional development and take an active role (Maaranen, 2009; Moon, 2013; Yu-le & Li, 2015). Teachers' use of reflective thinking is a necessity of a dynamic approach.

After the action plan has been developed, the teacher should be expected to teach according to the measures he has taken in the plan and to be given enough time. In an academic year, there are two semesters, which usually last 18 weeks. Each time, every six weeks, in a total of three times during the year will be repeated six applications. In this way, adequate monitoring and evaluation can be done during the professional development of teachers. After the implementation of the action plans, the cycle turns back to the beginning and whether the development needs of the teachers are met is determined by the student responses. This cycle repeats throughout the professional life of teachers.

There may be difficulties in implementing the dynamic approach. For example, it may take time to collect and analyze data with the teacher professional development student assessment scale. This can be overcome if the scale can be answered in a computer environment. Thus, the analysis of the data is done by the computer. Educators can take students to the computer lab to provide students with answers to the form. Similarly, if the data can be collected with tablets, students may be able to respond to the scale within the class. Another challenge is that teachers should be trained in the implementation of the approach. During the first time of the approach, teachers should be guided as in this study. In cases where one-to-one guidance is not possible, teachers can be trained in small groups. Thus, teachers may be able to apply the approach on their own.

The implementation of the dynamic approach in professional development has similar aspects to the previously developed auditing models. In the simplest form of the application, it can be said that the control loop, which consists of the steps of assessment, evaluation, and development, is more detailed. There are similarities between the observation of the teacher to improve the quality of teaching and the application of a clinical audit approach including planning and face-to-face interviews with the teacher. However, based on student assessment based on the dynamic professional development approach, the implementation differentiates it from other applications. The separation of qualified teaching into factors and the measurement of these factors through standardized data collection tools allow the evaluation to be based on objective and scientific foundations. Also, the use of reflective thinking can fill the gap between theory and practice. Therefore, it can be said that the application has its own characteristics.

The aim of the dynamic approach and the application according to this approach is to improve the teaching in the classroom. As the students are the best to know the teaching in the classroom, the student assessment is at the core. Considering that the teachers want to be evaluated by their students, student assessment is recommended in the literature and applied in the world, the practicality of this practice can be understood. Therefore, it may not make sense to evaluate the teaching of teachers by parents and administrators who are not in the classroom.

Suggestions

Professional development of teachers should be provided according to their needs. Students' observations should be used to determine the needs. Teachers should be sincerely motivated to realize their professional development needs and to ensure their professional development. Planning should be done in professional development activities. Professional development can be more effective if the scope of the activities is planned in advance according to the needs of the teachers. Activities should be planned not only based on theory but also teachers' answers to the problems. While teacher professional development is provided by distance learning, the use of teleconferencing which holds teachers in the passive role should be limited. Distance learning methods and techniques should be used to ensure effective participation of teachers.

Measures should be taken to ensure that family responsibilities do not prevent women teachers from taking time for professional development. Various attempts should be made to reduce the workload of women teachers, including reducing school hours. Teachers should be prevented from being indifferent to professional development. For this purpose, the importance of professional development to teachers should be understood and guided. Teachers should be told about the need for improvement and the benefits to be provided by development in order to be motivated for professional development. Teachers with professional development should be rewarded in schools, districts, and provinces.

Measures should be taken to ensure that restricted city facilities do not interfere with the professional development of teachers. Teachers who work in cities where transportation

is difficult should be provided with financial support so that they can participate in activities outside the city and their class hours should be arranged in such a way that they do not interfere with the activities. Increasing professional development activities in these cities may also be recommended. In addition, it may be a solution to the cooperation between institutions in order to contribute to teacher professional development of education faculties. For this purpose, although formal arrangements have been made to ensure that teachers participate in activities such as congresses and symposiums, in practice, the disadvantages that prevent each teacher from being allowed to participate should be overcome.

It may be advisable for school administrators to go beyond the sharing of knowledge and experience with teachers so that they can fully contribute to teacher professional development. If the school administrators are trained in the dynamic approach and the researcher's role in this research can be ensured, administrators may be able to contribute more to the professional development of teachers. Because administrators see themselves in the same position as teachers, they should not be prevented from being effective in teacher professional development. For this purpose, the duties of administrators to contribute to teacher professional development should be emphasized and the powers of administrators should be increased.

The competencies of teachers in classroom management and assessment and evaluation should be increased. It should be determined which teachers feel the need to develop in these areas and they should be encouraged to participate in professional development.

Observation of teachers by the administrators in the classroom should be limited. On the other hand, teachers should be evaluated by the students. By using the views of the students who are already observing in the classroom, external intervention in the classroom environment can be prevented and thus education is not hampered for evaluation.

In this research, since the teachers make progress in professional development when they teach according to the dynamic approach, the practice in the research should be re-applied with all branch teachers in middle and high schools. The difficulties encountered during the research should be overcome and the application should be made possible in the professional development of teachers from all branches in middle schools and high schools. In the new application, the student professional development student assessment scale may be made answerable with a tablet computer.

In-service training should be provided to the school administrators and teachers who will make the application. Training should not be based solely on theoretical knowledge transfer. It should be ensured that teachers take an active role with practical activities. If distance learning is to be applied, the teleconferencing method with one-way communication should not be used. Practical training should be organized for teachers to develop an action plan by reflective thinking. The aim of the training should be to improve the classroom teaching activities of the teacher who plays a decisive role in student achievement. School administrators should take an active role in the implementation. Administrators should take measures to eliminate the barriers of professional development that teachers face. It is advisable for administrators to guide teachers to develop an action plan.

The impact of the application on student achievement should be examined by experimental research. If the causal link, which cannot be obtained within the scope of this study, is proved experimentally, the effectiveness of the application can be better understood. It can also be determined whether the effect to be determined varies according to the demographic characteristics of schools, branches, students and teachers. If differences are found, measures can be taken for adverse effects by investigating the causes.

The dynamic approach to pre-service teacher education should be included. The importance of the subject can be understood by adding the dynamic approach to the content of the vocational courses in the teacher training program. If the approach is introduced, teachers' facilitation of the approach can be achieved.

The Ministry of National Education should implement legislative arrangements for the implementation of the dynamic approach. Measures should be taken at the ministerial level in order to remove teachers' professional development barriers. School administrators and teachers should be encouraged to implement the approach.

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Investigating the Psychological Resilience of Fathers with Mentally Handicapped Children

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Abstract

The purpose of this study was to examine the psychological resilience of fathers with mentally handicapped children. The study utilized the relational survey model, which is one of the quantitative research models. The unit of analysis of the study was the fathers of children with special educational needs. "The Resilience Scale for Adults" was implemented to construct survey questionnaire and measure the psychological resilience of fathers, as the data collection tool. The study findings depict that the fathers with mentally handicapped children have the highest social competence among the 26-35 age group. The results provide that the group with the highest level of psychological resilience is the group having college or vocational school graduation grade in terms of the educational status of the participants. As for the variable of the job status of fathers, the findings postulate that the future perception level of the employed group is higher than the non-employed group. As a result of the analysis, no statistically significant relationship was found between the psychological resilience levels of total and other sub-dimensions and the total number of children in the family.

Keywords: Mentally Handicapped Children, Fatherhood, Psychological Resilience

Introduction

Psychological resilience is a concept of the process of adaptation to important stress sources such as trauma, familial and relational problems, significant health problems, and financial problems (Tusaie & Dyer, 2004).

It is not possible to explain psychological resilience in a single dimension. Psychological resilience is a dynamic process and it can be improved. It must be exposed to harsh living conditions and includes effective coping strategies, adaptation, and competence processes. Correspondingly, the individual should be exposed to risk or difficulty, able to leave the situation by adapting to it, and should show a number of personality characteristics that are protective factors of psychological resilience in order to develop the psychological resilience (Gizir, 2007; Gürgan, 2006).

Vulnerability or weakness is completely related to the ability to resist the negative effects of distressing experiences. Hence, weakness or vulnerability is inversely correlated to the psychological resilience. Vulnerability or weakness should be evaluated with emotional, cognitive, and social areas (Truffino, 2010). The mental toughness is another concept that is associated with the concept of the psychological resilience. Four dimensions of mental toughness determined by Jones et al. (2007) are as follows: attitude/mindset (beliefs and adaptation), training, competition management pressure, belief, emotional regulation, awareness, control of emotions and thoughts, managing the situation, and post-competition (managing success and failure) (as cited in Truffino, 2010).
It is vital to be exposed to risk and difficulty in life to develop the psychological resilience. Protective factors must be found to reduce and eliminate the negative effects of the risky living conditions. In other words, it must be risky to talk about the psychological resilience (Yılmaz, 2009). Protective factors are an important mechanism for the psychological resilience. The protective factors facilitate the constructive effect of an individual against negative life experiences (Karaırmak, 2006).

Masten and Powell (2003) classified the protective factors into three categories which are individual factors, family-related protective factors, and non-family-related protective factors. Individual factors are defined as self-efficacy, self-esteem, intellectual capacity, establishing good environmental relations, adaptability, and self-confidence. Family-related protective factors are described as high-income family, exhibiting good parental characteristics of parents, healthy relationship between parents, and strong family bonds. Non-family-related protective factors are defined as establishing a positive and intimate relationship with an adult from outside the family, studying in a high-ranking school, and having an effective and high-level environment.

Studies on psychological resilience explore the relationship between the factors that are important for early childhood development, such as self-protection and safety, effective learning opportunities, family-provided social support, and the development of self-ordering skills (Masten & Gewietz, 2006).

One of the protective factors of caregiving families is that they have the ability to think positively when faced with a difficult situation. Both protective and risk factors directly affect the psychological resilience of caregiving families (Bekhet, Zauszniewski, & Nakhla, 2008).

The risk factors for the psychological resilience are as follows: negative life experiences that an individual may encounter, environmental disasters that the individual is exposed to, all events that affect the individual's wellbeing in terms of his/her psychological conditions (Karaırmak, 2006). The ways individuals perceive events under the pressure of stress and in times of crisis, attitudes towards these events and methods they use to cope with these situations may vary. Psychologi-

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cal resilience is the personality trait, which is a sign for a positive performance, health, and mood of the individual under the pressure of the stress (Maddi et al., 2006). Many studies have found the relationship between the psychological resilience and emotional intelligence. Martins et al. (2010) found a statistically significant relationship between emotional intelligence and psychological health.

Family plays a significant role in the development of the psychological resilience capacity. Black and Lobo (2008) identified important factors that play a role in the development of the psychological resilience: positive point of view, spiritual values, communication and agreement among family members, flexibility, family time, sharing happiness, and rules of existence and routines (as cited in Truffino, 2010).

Parents of children with disabilities have different emotional behaviors in the face of an unexpected new situation and the challenges posed by this new situation. These behaviors may differ depending on the personalities of the parents, the way they perceive the incident and the quality of their relations. When the reactions of the parents to this situation were examined, it was observed that the first reactions showed the stages of shock, denial, and disbelief. These initial reactions were followed by anger, guilt, shame, sadness, depression, low self, and denial of the child, which consist of irregular emotions. The last point that parents can reach is the acceptance stage of their child that involves recognizing the difficulty of the situation. All parents experiencing these stages differ from each other. Some parents never embrace the situation that their child has a special situation, while some experience these traumatic stages all over again in reaching the child's developmental stages (Ataman, 2005).

Parents of children with disabilities have a higher risk for experiencing higher level of stress in comparison with parents of typically developing children (Mujkanovic, Mujkanovic, Pasalic & Memisevic, 2017). There is a significant difference between the fathers of children with disabilities and fathers of non-disabled children in terms of their life satisfaction level. In other words, the life satisfaction level of fathers having children with disabilities is lower than fathers of non-disabled children (Aysan & Özben, 2007).

Parents obliged to prepare their children for life tend to participate more in their children's care responsibilities and education. Especially if the child is disabled, the burden of the family increases exponentially. Even though mothers are generally accepted as the key person directly responsible of the child's care, it is hard to disregard the importance of fathers in care and education of the children with disabilities. Preparing a child with a disability for life is a major challenge for parents in terms of social, economic, and psychological situations. Determining the factors that affect 'psychological resilience levels in fathers' coping processes with this difficulty constitutes the problem of this research.

Purpose of the Study

The purpose of this study is to examine the level of the psychological resilience of the fathers with mentally handicapped children according to the variables of the study. The research questions of the study are as follows:

Research Questions of the Study:

1. Whether and to what extent is the level of psychological resilience of fathers with mentally handicapped children associated with the age variable?

2. Whether and to what extent is the level of psychological resilience of fathers with mentally handicapped children associated with the educational status?

3. Whether and to what extent is the level of psychological resilience of fathers with mentally handicapped children associated with the employment status of the fathers?

4. Whether and to what extent is the level of psychological resilience of fathers with mentally handicapped children associated with the number of students?

Methodology

Research Model of the Study

Relational survey model, one of the quantitative research models, was implemented to construct a survey questionnaire in the study. Relational survey models are defined as research models aiming to determine the existence and/or degree of coexistence between two or more variables (Karasar, 2011).

Study Group

The unit of analysis and the population of the study was fathers with mentally handicapped children and benefited from special educational services. The sample consisted of 50 fathers. Table 1 depicts the descriptive frequency and percentage values of the study group.

Table1. *The descriptive frequency and percentage values of the study group*

Demographic Features	*f*	%
Age		
18-25	4	8.0
26-35	15	30.0
36-45	15	30.0
46 and over	16	32.0
Educational Status		
Illiterate	3	6.0
Primary school graduate	19	38.0
Secondary school graduate	6	12.0
High-school graduate	18	36.0
Bachelor's/Associate's Degree graduate	4	8.0
Job Status		
Employed	19	38.0
Unemployed	31	62.0
Total	50	100

Descriptive analysis was used to see the main features of the dataset. Descriptive statistics of SPSS provided frequency tables and the distribution of the variables. A frequency table of each study variable was provided independently to show how the responses were distributed. Table1 depicts the details.

Data Collection Instruments

A survey scale consisting 2 parts was used to construct a survey questionnaire. "The Personal Information Form" was a self-structured questionnaire asking participants demographic features such as father's age, educational status, employment status, and total number of children in the family. "The Resilience Scale for Adults" (Friborg et al., 2003) was implemented to collect data on the psychological resilience of the fathers.

The resilience scale for adults

The Resilience Scale for Adults developed by Friborg et al. (2003) focusing on protective resources for the protection of psychological resilience consists of 33 items (as cited in Basım & Çetin, 2011).

In the scale, the response set was designed in accordance with the five-point Likert Scale, in which the positive and negative characteristics were on different sides in order to keep away from the prejudiced assessments (Basım & Çetin, 2011).

The validity and reliability of the study of the Psychological Resilience Scale for Adults was conducted by Basım and Çetin (2011) and consisted of 33 items and 6 sub-dimensions. The sub-dimensions and items of the scale were determined as follows: structured style (3, 9, 15, 21), planned future (2, 8, 14, 20), family cohesion (5, 11, 17, 23, 26, 32), self-perception (1, 7, 13, 19, 28, 31), social competence (4, 10, 16, 22, 25, 29), and social resources (6, 12, 18, 24, 27, 30, 33). In the scale, the questions of 1, 3, 4, 8, 11, 12, 13, 14, 15, 16, 23, 24, 25, 27, 31, 33 were reverse-scored items. Basım and Çetin (2011) conducted the validity of factor structure of the scale with a sample group of 350 students. As a result of the analysis, the calculated values of the Root Mean Square Error of Approximation (RMSEA) was .053, Tucker Lewis Index (TLI) was .91, while Comparative Fit Index (CFI) was .92. The CFI and TLI must be bigger than .9 and RMSEA must be smaller than .05 to establish the model as reasonably fit.

The results showed that the six-dimensional factor structure had adequate compliance values.

In order to calculate the internal consistency of the scale, Cronbach's Alpha values of the sub-dimensions and the item total correlations were calculated for two different sample groups. Item total correlation coefficients ranged from .20 to .52 for the two sample groups. Total Cronbach's Alpha coefficients were calculated as .86 for each sample (Basım & Çetin, 2011). A Cronbach's Alpha score greater than .70 provides a satisfactory internal consistency for the study.

The test-retest method was carried out with a total of 350 participants. As a result of the analysis, the Pearson correlation coefficients of the sub-dimensions between the two test applications were as follows: .72 (p< .01) for the self-perception, .75 (p< .01) for the planned future, .68 (p< .01) for the structured style, .78 (p< .01) for the social competence, .81 (p< .01) for the family cohesion and .77 (p< .01) for the social resources (Basım & Çetin, 2011)

Findings

This section presents the data analyses and findings of the study with a set of recommendations.

Findings on the Differentiation of the Psychological Resilience of the Fathers with Mentally Disabled Children by Their Ages

Kruskal Wallis-H Test was implemented to determine whether the total mean ranks of the Resilience Scale for Adults and mean ranks of its sub-dimensions differ from each other in terms of the age of the fathers. Table 2 provides the results.

As Table 2 depicts, the difference between the mean ranks of fathers having children with special educational needs and the mean ranks of groups were not statistically significant in terms of the age variable, except for social competence sub-dimension. As the findings indicate, the social competence sub-test mean ranks of the groups are statistically significant at the .05 level (χ2= 9.656; sd= 3; p< .05) by the age variable. As for the mean ranks of the groups, the 26-35 age group has the highest level of social competence, and it is followed by the 36-45, 18-25, 45 and over age groups, respectively. Effect size calculations have become important criteria for reporting of research, supporting null hypothesis significance testing and obtaining higher quality statistical results (Özsoy & Özsoy, 2013). According to the eta square values (η^2) calculated to test the size of the age groups independent on the Psychological Resilience scores, it is seen that the participants' age groups has a medium effect (η^2= 0.05) on total psychological resilience scores.

Findings on the Differentiation of the Psychological Resilience of the Fathers with Mentally Disabled Children by Their Educational Status

Kruskal Wallis-H Test was implemented to determine whether the total mean ranks of the Resilience Scale for Adults and mean ranks of its sub-dimensions differ from each other by the educational status of the fathers. Table 3 provides the results.

Table 3 gives the mean ranks of the groups. The self-perception sub-test mean ranks of the groups are statistically significant at the .05 level (χ2= 10.603; sd= 4; p< .05) by educational status of the fathers. The findings of the analysis provide us that the Bachelor's or Associate's degree graduate group has the highest self-perception level, and it is respectively followed by primary school, high-school, secondary school graduate, and illiterate groups. The social competence sub-test mean ranks of the groups are statistically significant at the .01 level (χ2= 14.317; sd= 4; p< .01). The mean ranks of the groups findings provide us that the Bachelor's or Associate's degree graduate group has the highest social competence level, and it is respectively followed by secondary school, high-school, primary school graduate and illiterate groups. The total psychological resilience mean ranks of the groups are statistically significant at the .05 level (χ2= 10.271; sd= 4; p< .05). The mean ranks of the groups findings reveal that the Bachelor's or Associate's degree group has the highest psychological resilience level, and it is respectively followed by primary school, secondary school, high-school graduate, and illiterate groups. According to the findings, the difference between the other sub-test mean ranks of the groups was not statistically significant by the educational status of the participants (p> .05). According to the eta square values (η^2) calculated to test the size of the educational status groups independent on the Psychological Resilience scores, it is seen that the participants' educational status groups has a large effect (η^2= 0.13) on total psychological resilience scores.

Findings on the Differentiation of the Psychological Resilience of the Fathers with Mentally Disabled Children by Their Job Status

Mann Whitney-U Test was implemented to determine whether the total mean rank of the Resilience Scale for Adults and mean ranks of its sub-dimensions differ from each other by the employment status of the fathers. Table 4 gives the details.

Table 4 depicts that planned future sub-test mean ranks of the groups differed statistically at the .05 level (U= 178.000, p< .05) by the job status of the fathers. The mean ranks of the groups results provide us that the planned future level of employed group is higher than the unemployed group. The results reveal that self-perception sub-test mean ranks of the groups differed statistically at the .05 level (U= 184.500, p< .05). The mean ranks of the groups provide that the self-perception level of employed group is higher

Table 2. *Findings on the Differentiation of the Psychological Persistence of Fathers with Mentally Disabled Children by Their Ages*

	Groups	*n*	Mean Rank	χ2	*sd*	η^2	*p*
Structured Style	18-25 age	4	23.75	5.905	3	0.06	.116
	26-35 age	15	29.40				
	36-45 age	15	29.47				
	45 and over age	16	18.56				
	Total	50					
Planned Future	18-25 age	4	18.38	3.090	3	0.00	.378
	26-35 age	15	29.87				
	36-45 age	15	26.30				
	45 and over age	16	22.44				
	Total	50					
Family Coherence	18-25 age	4	27.75	2.043	3	0.02	.563
	26-35 age	15	27.67				
	36-45 age	15	27.30				
	45 and over age	16	21.22				
	Total	50					
Self-Perception	18-25 age	4	16.38	6.201	3	0.07	.102
	26-35 age	15	32.60				
	36-45 age	15	24.73				
	45 and over age	16	21.84				
	Total	50					
Social Competence	18-25 age	4	22.25	9.656	3	0.14	.022*
	26-35 age	15	34.73				
	36-45 age	15	24.13				
	45 and over age	16	18.94				
	Total	50					
Social Resources	18-25 age	4	19.00	1.688	3	0.02	.640
	26-35 age	15	25.07				
	36-45 age	15	28.83				
	45 and over age	16	24.41				
	Total	50					
Psychological Resilience Total	18-25 age	4	21.63	5.606	3	0.05	.132
	26-35 age	15	31.43				
	36-45 age	15	26.97				
	45 and over age	16	19.53				
	Total	50					

*p< .05; **p< .01

than the unemployed group. According to the results of the analysis, the difference between the total and other sub-test mean ranks of the groups was not statistically significant by the employment status of the participants (p> .05). According to the eta square values (η^2) calculated to test the size of the job status (employed/unemployed) independent on the Psychological Resilience scores, it is seen that the participants' working status has a small effect (η^2= 0.01) on total psychological resilience scores.

Findings on the Relationship between the Psychological Resilience of the Fathers with Mentally Disabled Children and the Total Number of Children in Family

The purpose of this study is to examine the relationship between the psychological resilience of fathers with mentally handicapped children and the total number of children in the family. For this purpose, Pearson Moments Multiplication Correlation Coefficient technique was implemented. Table 5 and Table 6 provide the arithmetic mean of the scores taken from the RSA by the sample group, the standard error of the arithmetic mean, and the standard deviation values.

The statistical analysis was conducted to determine the relationship between the psychological resilience levels of the fathers with mentally handicapped children and the total number of children in the family. As Table 5 and Table 6 reveal, a statistically significant correlation was found only between the self-perception sub-test means and the total number of children in the family with a negative relationship (r= -.333, p< .01). Hence, it is safe to say that the self-perception sub-test means are negatively related to the total number of children in the family.

According to this result, the self-perception level increases while the total number of children in the family decreases. As a result of the analysis, there is no statistically significant relationship between the other sub-dimensions and total psychological resilience level and the total number of children in the family (p> .05).

Table 3. *Findings on the Differentiation of the Psychological Persistence of the Fathers with Mentally Disabled Children by Their Educational Status*

	Groups	*n*	Mean Rank	χ2	η^2	*p*
Structured Style	Illiterate	3	12.50	7.533	0.07	.110
	Primary school graduate	19	23.34			
	Secondary school graduate	6	29.75			
	High-school graduate	18	25.22			
	Bachelor's/Associate's Degree graduate	4	40.38			
	Total	50				
Planned Future	Illiterate	3	22.50	8.862	0.10	.065
	Primary school graduate	19	27.45			
	Secondary school graduate	6	22.00			
	High-school graduate	18	21.06			
	Bachelor's/Associate's Degree graduate	4	43.75			
	Total	50				
Family Coherence	Illiterate	3	19.33	7.208	0.07	.125
	Primary school graduate	19	25.84			
	Secondary school graduate	6	15.83			
	High-school graduate	18	26.17			
	Bachelor's/Associate's Degree graduate	4	40.00			
	Total	50				
Self-Perception	Illiterate	3	17.50	10.603	0.14	.031 *
	Primary school graduate	19	27.42			
	Secondary school graduate	6	21.33			
	High-school graduate	18	21.72			
	Bachelor's/Associate's Degree graduate	4	45.63			
	Total	50				
Social Competence	Illiterate	3	11.50	14.317	0.22	.006 **
	Primary school graduate	19	22.11			
	Secondary school graduate	6	35.00			
	High-school graduate	18	23.78			
	Bachelor's/Associate's Degree graduate	4	45.63			
	Total	50				
Social Resources	Illiterate	3	21.00	1.849	0.04	.764
	Primary school graduate	19	27.37			
	Secondary school graduate	6	28.00			
	High-school graduate	18	22.53			
	Bachelor's/Associate's Degree graduate	4	29.63			
	Total	50				
Psychological Resilience Total	Illiterate	3	13.33	10.271	0.13	.036 *
	Primary school graduate	19	25.89			
	Secondary school graduate	6	25.17			
	High-school graduate	18	22.78			
	Bachelor's/Associate's Degree graduate	4	45.50			
	Total	50				

*p< .05; **p< .01

Results and Discussion

The purpose of the study was to determine whether the psychological resilience of the fathers with mentally handicapped children by the age, educational status, employment status of the fathers, and the number of children in family.

The psychological resilience is a concept of adaptation to important stress sources such as trauma, familial and relational difficulties, significant health problems, and financial problems (Tusaie & Dyer, 2004).

The unit of analysis of the study was fathers with mentally handicapped children. These fathers are faced with trauma at the first time when they have a child with a disability and live together with children having lifelong difficulties. This situation gives rise to several communication and adjustment problems in the family and it brings a great deal of health problems and additional expenses. Therefore, it

Table 4. *Findings on the Differentiation of the Psychological Persistence of Fathers with Mentally Disabled Children by Their Employment Status*

	Job Status	*n*	Mean Rank	Signed Rank	*Mann Whitney U*	*z*	η^2	*p*
Structured Style	Employed	19	22.71	431.50	241.500	-1.063	0.02	.288
	Unemployed	31	27.21	843.50				
Planned Future	Employed	19	19.37	368.00	178.000	-2.343	0.10	.019*
	Unemployed	31	29.26	907.00				
Family Coherence	Employed	19	26.53	504.00	275.000	-.390	0.00	.696
	Unemployed	31	24.87	771.00				
Self-Perception	Employed	19	19.71	374.50	184.500	-2.203	0.09	.028*
	Unemployed	31	29.05	900.50				
Social Competence	Employed	19	21.95	417.00	227.000	-1.354	0.03	.176
	Unemployed	31	27.68	858.00				
Social Resources	Employed	19	28.87	548.50	230.500	-1.281	0.03	.200
	Unemployed	31	23.44	726.50				
Psychological Resilience Total	Employed	19	23.18	440.50	250.500	-.880	0.01	.379
	Unemployed	31	26.92	834.50				

*p< .05; **p< .01

Table 5. *The Arithmetic Mean of the Scores Taken from the RSA by the Sample Group, the Standard Error of the Arithmetic Mean, and the Standard Deviation Values*

Job Status	*n*	*M*	*se*	*sd*
Structured Style	50	10.9600	.62984	4.45366
Planned Future	50	9.4800	.58431	4.13171
Family Coherence	50	20.3800	.84026	5.94152
Self-Perception	50	17.7000	.81629	5.77203
Social Competence	50	20.1400	.89077	6.29872
Social Resources	50	23.2000	.92978	6.57453
Psychological Resilience Total	50	101.8600	3.52889	24.95303

Variables	1	2	3	4	5	6	7	8
1.The Number of Children	-							
2.Structured Style	-.185	-						
3.Planned Future	-.161	.586**	-					
4.Family Coherence	.065	.217	.401**	-				
5.Self-Perception	-.333**	.462**	.726**	.387**	-			
6.Social Competence	-.157	.567**	.523**	.484**	.632**	-		
7.Social Resources	.171	.261	.414**	.569**	.399**	.518**	-	
8.Psychological Resilience Total	-.116	.646**	.775**	.705**	.791**	.838**	.737**	-

*p< .05; **p< .01

is safe to say that fathers with mentally handicapped children have the necessary risk factors in order to talk about the concept of psychological resilience. The findings of the study reveal that the fathers with mentally handicapped children have the highest social competence group in the 26-35 age group, followed by 36-45, 18-25 and 45 age groups. The literature shows that the findings of this study are consistent with the findings of the other studies regarding the issue. Bildirici (2014), in his study on the psychological resilience of mothers, found the positive relationship between the age and the psychological resilience, postulating that the psychological resilience increased when the age increased. The difference of the psychological resilience scale scores of the teachers working in the special education schools for handicapped was found to be statistically significant (Uçar, 2014). The findings on the average scores provided us that the mean scores of psychological resilience increased as the age increased. According to the research conducted by Yalçın (2013), the psychological resilience levels of the teachers differed significantly by their ages and the psychological resilience level of the teachers increased as the age of the teachers increased. Some findings in the literature did not support the findings of this study.

The studies of Chan (2003) and Sezgin (2009) found no difference on the psychological resilience levels of the teachers by the age of the participants.

By the educational status of the fathers, the findings of the analysis reveal that the Bachelor's or Associate's degree graduate group has the highest self-perception level and it is respectively followed by primary school, high-school,

secondary school graduate, and illiterate groups. In the literature, studies supporting the research findings were reached (Akıncı-aydoğan, 1999; Bildirici, 2014; Bozgeyikli & Şat, 2014; Sucuoğlu, 1995).

In a study, Akıncı-Aydoğan (1999) found an inverse relationship between the educational level of the family and despair. In other words, fathers having higher educational levels can look at the future with more hope and this situation may increase the psychological resilience of the fathers. Bildirici (2014), in her study examining the relationship between mothers' psychological resilience and the family burden, found that the scores on the psychological resilience scale increased as the educational status of the mothers increased. Hence, it is safe to say that the educational status affected psychological resilience. The study of Sucuoğlu (1995) determined that the most important needs of families were to talk to other families of children with disabilities, read books regarding their children, and reach information about teaching skills. For this reason, if fathers' access to information, relevant books and resources, and share information with other families are considered, it is understandable that the educational level affects psychological resilience.

When the psychological resilience of the fathers with mentally handicapped children was examined by the employment status of the fathers; the difference between the means ranks of the groups was statistically significant for the planned future sub-test according to the employment status of the participants. As for the mean ranks, it is seen that the planned future level of the employed group is higher than the non-employed group. As a result of the analysis, the difference between the mean ranks of the groups was statistically significant for the self-perception sub-test by the employment status of the participants. The findings of the mean ranks give us that the self-perception of the employed group is higher than the non-employed group. The findings of the study by Bildirici (2014) is consistent with the findings of this study, postulating that there was a statistically significant difference between the monthly average income levels and the means of the psychological resilience scale of the mothers having children with special education and participated in the research, and the psychological resilience increased when the family's mean monthly income level increased. With the birth of children with disabilities, there is a significant increase in the family's medical and educational expenses. This can be considered as a situation increasing the future anxiety of the family and significantly decreases the prospects of the future. Smith et al. (2006) reported that there was an increase in the cost of bringing up child as one of the family's potential stress areas. Akıncı Aydoğan (1999) concluded that there was an inverse relationship between family income levels and despair. When fathers are employed, it can reduce this anxiety and lead to the future with more hope, which can be interpreted as a factor that increases the psychological resilience of the fathers.

The findings regarding the relationship between the psychological resilience of fathers with mentally handicapped children and the total number of children in the family indicate that the total number of children in the family decreased as the level of self-perception increased. As a result of the analysis, there is no statistically significant relationship between the other sub-dimensions and total psychological resilience level and the total number of children in the family. A study of Bildirici (2014) found similar results and her findings are consistent with this study. Bildirici (2014) found that there is no statistical difference between the scores obtained from the psychological resilience scale and mothers who have children with special education need to have more than one special education supports the present research findings. Fraternal relationships are defined as the relationship between the birth of the youngest brother and the lifelong (Ahmetoğlu & Aral, 2008). Since the fraternity is an innate relationship, no other relationship lasts as long as it is (Onat Zoylan, 2005). Siblings, like parents, share sadness, grief, and struggle that may be caused by the insufficiency of the birth of a baby with deficiencies (Seligman & Darling, 2013). Having normal children in the family provides considerable comfort to the majority of the parents (Gath, 1992). Although it is highlighted in the literature that having siblings has a positive effect on the family, the responsibility of raising a child with a disability is commonly considered as the responsible of the mother, and some of this task and responsibility are shared with the older sisters in the family (Gath, 1992).

Since the unit of analysis and the population of the study were fathers, the presence and number of siblings could explain the effect of the fathers' psychological resilience. On the other hand, Griffiths and Unger (1994) concluded that parents hoped that their children with mental handicapped in the future would be cared for by their normally developing siblings according to the study of 'Views about Planning for the Future among Parents and Siblings of Adults with Mental Retardation'. This expectation in families is also anticipated to affect the psychological resilience of the fathers. This situation is not expected to occur with the findings of this research. It may be thought that there may have been a change in the expectations of families or the researches made in different cultures may have been caused by cultural differences since it has been a long time since the study of Griffiths and Unger (1994) was published. Future researchers can contribute to the literature by examining the similar issues to clarify the situation.

Recommendations

In the light of findings discussed above, the study has the following suggestions: There are several factors that may affect psychological resilience of the fathers with disabled children. Future research should study the other variables that were not examined by this study.

Governments should increase the facilities providing services for families with children who are in need of special education. The psychological resilience of the fathers varies by their income level and educational status. Adequate social resources and economic support should be provided to these families who have social, emotional, economic, and time difficulties. As the findings of this study have proved that the educational levels of participants positively affect their psychological resilience, ill-informed fathers should be well informed about their children's education and proper behaviors. In addition, some centres should be established to provide psychological support for groups and individuals.

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Metaphors on Open-Ended Question and Multiple-Choice Tests Produced by Pre-Service Classroom Teachers

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Abstract

Open-ended exams and multiple-choice exams are two types of examinations that are highly preferred in educational sciences. They have several advantages in terms of their characteristics, and they also have some limitations. These advantages and limitations affect the use of these exams both in national exams and in the exams administered by teachers in their classes. The purpose of the present research is revealing the perceptions of the candidates of the classroom teachers by means of metaphors. The research was carried in accordance with qualitative research methods and designs. The research was designed according to phenomenology. The study group consisted of 355 pre-service classroom teachers. According to the findings of the present research, pre-service classroom teachers produced 240 metaphors related to open-ended and multiple-choice exams. The metaphors produced by the pre-service classroom teachers related to the classical open-ended exams were grouped under 13 categories, while the metaphors for multiple choice exams were grouped under a total of 10 categories. The most frequently used metaphors produced for open-ended examinations were "freedom in answering" (24.5%), "requiring knowledge" (20.4%) and "negative association" (11.2%), while for the multiple-choice exams these were "offering options" (28.8%) and "chance success" (20.4%).

Keywords: Multiple-Choice, Classical Written, Open-Ended Question, Metaphor

Introduction

The main indicator of the extent to which goals are achieved by education is assessment and evaluation. It is important to determine the level at which the goals are achieved and the level of success by education, which is also known as behavior changing process, so that it can guide the educational activities to be planned in the future. Like all educational activities, the basic function of assessment and evaluation is to improve learning and improve the effectiveness of teaching in various ways (Karaca, 2010). Defining which student is unsuccessful or at what level they are successful requires the assessment and evaluation of behavioral changes in the student. In order to make accurate decisions about the students, the correct value judgments about the success of the student should be made. Accuracy of value judgments depends on both accurate assessment and observations and on the conformity of evaluation criteria (Turgut, 1992). There are many ways and methods of assessment and evaluation. This is sometimes done with a homework, a project, a presentation or an examination. Teachers can improve the course they are responsible for if they know how effective a program is, and ultimately, they can make more accurate decisions about the course (Tan, 2008). Teachers determine the preferences of the exam, taking into account the preparation, administration and scoring, while the taxonomic order of the goals, teacher's habits, knowledge and skills are also effective on their examination preferences. The students also may have requests about the types of exams to be made from their teachers for various reasons (chance of success, duration, number of questions, etc.). Two of the traditional assessment and evaluation methods used by Turkish teachers in every level of the education are classical (open-ended) and the multiple-choice exams.

Open-ended question exams

The written exams, which are also known as examinations with open-ended questions, are a kind of examination which is frequently used in education and in which students are asked to give answers to questions in written form in a period of time they are provided with (Tan, 2008; Tekindal, 2009). Students are required to read and understand the questions they are asked, to think of the answer to the question, find the answer and organize and write this answer in a regular format (Ozcelik, 2010). An open-ended question provides the respondent with freedom to write on the topic of their choice and in the expression of their answer. This freedom the respondent is provided with, is the most important feature of the examinations with open-ended questions. The students are free in their approach to the subject, and determining the degree of importance to be given to each of the points covered in the answer, the selection of the factual information to be used in the answer and in organizing and integrating them (Tekin, 1979). For this reason, open-ended exams are useful tests to assess the student's original and creative thinking power, written expression skills, knowledge, attitudes and they are assessment tools used in every level of education from primary education to higher education (Tekin, 1979; Yılmaz, 2011). The extent of the freedom the respondents are provided with is not the same for every open-ended question. The students may be asked to give a short and precise answer, while at the same time almost unlimited freedom can be given to determine the quality and scope of their answers. Therefore, limited response questions assess the level of knowledge, comprehension and application, while free-responders assess the level of analysis, synthesis and evaluation The most important advantage of open-ended examinations is that it is a type of exam which is very suitable for assessing complex behaviors (Cambaz, 2000, Tan, 2007). Examinations with open-ended questions can be used to explain relations, to compare two views, to support or reject an opinion, to apply information to new situations, to make a mathematical proof, to explain some scientific facts, to make inferences to analyze, to produce new ideas, to evaluate and to measure skills such as problem solving. Some important limitations are that the reliability of the scoring is low and the number of questions decreases due to the fact that the ma-

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jority of the examination period is allocated to writing, which decreases the scope validity examinations with open-ended questions (Yılmaz, 1996).

Multiple-Choice Tests

Multiple-choice tests are the assessment tools that respondents perform by marking a selection of answers from a set of options. In the multiple-choice tests, the respondent is expected to read the root of the question, to think about the answer and to select and mark the answer from the choices (Çetin, 2008). Multiple-choice tests were first developed by psychologist Edward Thorndike (1874-1949) (Medawela Ratnayake, Abeyasinghe, Jayasinghe, & Marambe, 2011). Multiple-choice tests are the most popular among the testing tools, and the most important reason for being commonly used is that they are easy to score (Ko, 2010; Yaman, 2016). When the person writing the questions for multiple choice tests has sufficient knowledge and skills, or when the tests are well structured, the behaviors at each step of the taxonomy can be assessed except for the skill levels that the students must produce themselves (Turgut & Baykul, 2011; Case & Swanson, 2001). A multiple-choice question consists of three parts: (i) the root involving the question body and the required information; (ii) the correct answer; and (iii) distractors, false answers (Snow, Monk, & Thompson, 1996). Multiple-choice tests are the most commonly used assessment tools in many educational institutions and organizations (from classes to national examinations) due to their advantage in objective scoring. It can be claimed that multiple-choice tests are the only type of exams used in student selection and placement exams, especially for the exams of open education and distance education institutions (Doğan, 2007). In addition, the ease of scoring increases the usefulness of the test and provides fast feedback to teachers and students. This makes multiple choice exams attractive (Lissitz, Hou, & Slater 2012). Multiple-choice tests allow for a large number of questions to be asked since their answering requires a short time, thus increasing the validity and reliability of these tests (Çakan, 2011).

Despite all these advantages, multiple choice tests have some limitations. Writing multiple-choice items is a highly difficult task, requiring specific knowledge and skills, which is also quite time-consuming. One of the most important limitations of the multiple-choice tests is that they are suitable for finding the right answer through guessing (Çetin, 2008; Doğan, 2007; Tan, 2008) and they are also not appropriate to measure the students' ability to put their thoughts at the level of analysis, synthesis and evaluation (Üstüner & Şengül, 2007).

Capturing the pre-service teachers' opinion about exams with open-ended questions and exams with multiple choice-questions

The aim of this paper is to present our research on capturing the pre-service teachers' opinion about the above-mentioned two types of questions in exams: Open-ended and multiple choice. We chose metaphors to accomplish our goal.

A metaphor is a set of words or phrases used to make the desired definition by using the words "like" or "as". In other words, metaphor, which means to express a matter in another way, refers to making an analogy with a linking word that has a different meaning, in order to better explain a concept, word, term or phenomenon (Aydın, 2006).
The word metaphor derives from Ancient Greek words "metapherein—meta", which means change and "pherein", which means carrying (Levine, 2005). The concept of metaphor has begun to take place in interdisciplinary applications with the theory called "Contemporary Metaphor Theory", which the linguist Lakoff and Johnson described in their work published in 1980 titled "Metaphors We Live By". (Cited in: Karaşahinoğlu, 2015). Metaphors are structures used to describe a concept, using other concepts, in order to strengthen expression, to enrich the language and to transform ideas into linguistic actions in the most effective way (Yalçın & Erginer, 2012). Involving metaphors in language contributes to the cognitive and affective development of individuals. Using metaphor can be claimed to be directly proportional to the ability to see the different aspects of concepts (Kart, 2016). Metaphors draw attention as an effective mental mapping and modeling mechanism in line with the understanding and structuring of individuals' worlds (Arslan & Baycan, 2006). Metaphor is an extraordinary issue, a device of poetic imagination and rhetorical development for most people, rather than ordinary language metaphors are also effective not only in language but also in thought and action in everyday life (Lakoff & Johnson, 2003). Metaphors are seen as a cognitive tool for the real-world phenomena of people to filter reality with their mental images (Nikitina & Furuoka, 2008). In this respect, metaphors allow an individual's mind to act from an understanding (comprehension) to another form of understanding (comprehension), allowing an individual to see a particular phenomenon as another phenomenon (Saban, 2008). Research with metaphors in educational cases creates a link between thought and action, because the metaphors reflected by individuals in the texts give consistent clues about their thoughts (Cameron, 2003: cited in Hamarat, 2016). Having these features of metaphors in mind, we believe that metaphors can be used in education to capture the pre-service teachers' thoughts about examination based on open-ended questions and examinations based on multiple-choice questions. As constant structures, metaphors are reflections of an age, a culture, an environment, and convey the actions and thoughts of those who use them (Draaisma, 2014: cited in Hamarat, 2016). Because of these features of metaphors, the present research tries to reveal students' opinions about classical open-ended tests and multiple-choice exams through metaphors. In accordance with this purpose,

Therefor we sought to find answers for the following questions;

1.What are the open-ended exam related metaphors produced by pre-service classroom teachers?

2.Under which conceptual categories can these metaphors be combined in terms of their common characteristics?

3.What are the multiple-choice exam related metaphors produced by pre-service classroom teachers?

4.Under which conceptual categories can these metaphors be combined in terms of their common characteristics?

Method

Research Design

The present research utilizes phenomenological design, which is a qualitative research design. The phenomenological design focuses on the facts that we are aware of but do not have in-depth and detailed understanding. Phenomenology constitutes an appropriate research base for the studies aiming to investigate the facts that we are not completely alien to us and yet we cannot completely comprehend (Yıldırım & Şimşek, 2013). Phenomenological analysis aims to understand and clarify the meaning, structure and essence of a person or a group of people's experiences of a phenomenon (Patton, 2015).

Study Group

One of the difficulties to be experienced in phenomenological research is the selection of the participants. Creswell (2007) draws attention to the fact that the phenomenon should be experienced by all participants in a phenomenological study (Cited in: Akar, 2016). For this reason, the study group of the present research consists of 355 pre-service classroom teachers, studying at the third year of Necmettin Erbakan University Ahmet Kelesoglu Faculty of Education in the Department of Classroom Education between 2014-2018, who took the measurement and evaluation course and therefore knew these types of exams. The data of the research was collected over a 4-year period.

Data Collection

In order to capture pre-service teachers' metaphorical perceptions of open-ended question and multiple-choice question tests, they were provided with a form, and they were asked to fill in the statements of "Classical open-ended question test is like ..., because ..." and "Multiple-choice test is like ..., because ..." in this form, and submit their forms within a week. These metaphors written by the participants with their handwriting were used as the main data source in the present research.

Data Analysis

In the analysis of the data obtained in the present research, content analysis was used. The main purpose of content analysis is to find the concepts and relations that can explain the collected data. The fundamental process in content analysis is bringing together similar data within the framework of certain concepts and themes and interpreting them by organizing them in a way that the reader can understand (Yıldırım & Şimşek, 2013). The metaphors developed by the participants were arranged according to the analyses in Saban's (2008-2009) studies and were carried out in 3 stages.
Coding and sorting stage. At this stage, data collected from 355 pre-service classroom teachers during 4 years were carefully read one by one and 55 of them were eliminated because they were not correct or missing due to different understandings and interpretations. The research continued with the coding and numbering of the data collected from the remaining 240 pre-service classroom teachers.

Categorization stage. The categories started to be formed based on the coding of data and each metaphor was collected under a category. Categories with similar names are placed below the appropriate categories according to the explanations given in the "because..." part.

Validity and reliability stage. In order to ensure the reliability of the research, all of the data were collected after the pre-service teachers took the assessment and evaluation course and they had sufficient knowledge about the types of exams. Forms collected from participants were numbered and all stored. The coded data was re-checked by a faculty member and a teacher and suitability of the categories was ensured. The reliability of the study was tested by using the formula (Reliability= consensus / consensus + disagreement X 100) of Miles and Huberman (1994: 64). In qualitative studies, the desired level of reliability is ensured in cases where the compliance between expert and researcher assessments is 90% or more. In the present research, a 92% compliance (reliability) was obtained. In the findings part of the research, the opinions were reflected by making quotations from the metaphors in the frequently repeated categories, using the form numbers (S.1, 2, 3, etc.).

Findings and Interpretation

In relation with the first and second sub-questions of the research, the metaphors produced by the pre-service classroom teachers for classical open-ended question exams and the categories in which these metaphors are collected are given in the table below.

As presented in Table.1, the total of 240 metaphors produced by the pre-service classroom teachers related to the classical open-ended question exams are grouped under 13 categories. Among these categories, most categories (24.5%) were produced related to the freedom in answering feature of open-ended question exams. This is followed by requiring knowledge (20.4%), negative association (11.2%) and written expression skills (10.8%) categories. The least metaphors were produced for number of questions (0.4%) and chance success (0.4%) categories.

Category 1: Freedom in Answering (Independent Answering)

There are 59 metaphors in this category. Pre-service classroom teachers define classical open-ended question exams as freedom in answering (independent answering). The most frequently repeated metaphor in this category was "ocean". The explanations for the metaphors in this category are as follows:

> *"Classical open-ended question exam is like an ocean, because we have the right to write what is expected from us, our thoughts and interpretations in our answers" (S191).*
>
> *"Classical open-ended question exam is like a car ride, because as you're the driver you can choose where to go and how to go" (S57).*
>
> *"Classical open-ended question exam is like the sky, because you can write anything that comes to your mind freely on the paper" (S8).*
>
> *"Classical open-ended question exam is like a novel, because as a novel tells something in detail, students tell the answer to the open-ended questions in detail" (S40).*
>
> *"Classical open-ended question exam is like making soup, because you add ingredients to the soup and stir it. In open-ended questions, you add your knowledge and interpretations to the answer and stir" (S60).*

Category 2: Requiring Knowledge

There are 49 metaphors in this category. Pre-service classroom teachers define classical open-ended question exams as requiring knowledge. The most frequently repeated metaphor in this category was "cooking". The explanations for the metaphors in this category are as follows:

> *"Classical open-ended question exam is like cooking, because you can have good results if you have the necessary knowledge and preparation" (S6).*
>
> *"Classical open-ended question exam is like a quiz show, because we can only answer the question if have knowledge of it" (S164).*
>
> *"Classical open-ended question exam is like singing, because you can only sing the songs that you know the lyrics of. If you don't, there is no way you can sing that song" (S12).*

Category 3: Negative Association

There are 27 metaphors in this category. Pre-service classroom teachers define classical open-ended question exams as negative associations. The most frequently repeated metaphor in this category was "nightmare". The explanations for the metaphors in this category are as follows:

Table 1. *The distribution of "classical open-ended question" related metaphors by categories*

Rank No	*Categories*	*f*	Metaphors	%
1	Freedom in answering	59	Ocean (3), Car ride (2), Sky (2), Octopus (2), Empty field (2), Tree growing (1), Open sea (2), Swimming (1), Tree roots (1), Ivy (1), Google (1), Open buffet (1), Gossiping (1), Thought Bubble (1), World (1), Play dough (1), Empty painting (1), Improvisation theater (1), Lace-up shoes (1), Career-making (1), Agriculture (1), Blank paper (1), Inflating a balloon (1) Tree (1), Make-up bag (1), Dairy (1), Making music (1), Woman doing make-up (1), Stream (1), Fate (1), Detached house (1), Drink hot water (1), Lottery (1), Novel (1), Newspaper article (2), UFO (1), Making soup (1), Self-catering places (1), Road (1), Novel (1) , Balloon (1), Painting (1), Weather forecast (1), Cake (1), Abstract drawing (1), Making material (1), Eliminating the limits of thought (1), Shoes (1), Dining (1) Shopping at the convenience store (1), Halay (1).	24.5
2	Requiring knowledge	49	Cooking (4), Quiz show (2), Singing (2), Drawing (2), Life (2), Teacher (1), Memory (2), Cobweb (1), Chess (1), Car driving (1), Streams (1), Identity (1), Stairs (1), Putting up curtains (1), Bonding a wall (1), Making vegetable soup (1), Salt shaker (1), Playing ney (1) Goggles (1), Blank pages (1), Shared taxi (1), Machine (1), Discovery (1), Chatting (1), Working employees (1), Desert (1), Intelligence games (1), Cooking without recipe (1), Shopping mall (1), Wholesaler (1), Father (1), Car engine (1), Road (1), The cicada and the ant tale (1), Fried meat (1), Deed book (1), Bus (1), School (1), Book (1), Fruit plate (1), Hereafter questions (1)	20.4
3	Negative Association	27	Nightmare (4), Tunnel of horror (2), Boxer (1), Bomb (1), Night terror (1), Swamp (1), Mixer (1), Dark (1), Burst ball (1), Bat (1), Thunderous day (1), Homework novel (1), Separating from girlfriend (1), Agonizing (1), Dreaming (1), Gravestone (1), Monster (1), Hayat (1), Ranger in the funfair (1), Funeral (1), Nightmare (1), Poison (1), Disappointment (1).	11.2
4	Written expression skills	26	Mirror (3), Gossip (2), Crossing a bridge (1), Field (1), Dinner (1), Climbing stairs (1), Driving (1), Brainbox (1), Snowflake (1), Teaching a child their surrounding (1), Pomegranate (1), Lemon (1), Soup (1), Writing an essay (1), Crossword (1), Testimony (1), Making Noah's pudding (1), Stage (1), Snack aisle (1), Knowing a person (1), Book (1), Clerkship (1) Climbing stairs (1)	10.8
5	Easy to prepare, difficult to score (practicality)	18	Tea (1), Painting (1), Whitewashing (1), Bicycle (1), Long-hair care (1), Making fried eggs (1), Instant soup (1), Driving very fast (1), Spaghetti (1), Cooking contest (1), Bee making honey (1), Technological tools (1), Pearl (1), Plant (1), Forest (1), Cauliflower dish (1), Pilaf (1), A dish of pilaf with stones (1).	7.5
6	Subjective scoring	16	Water glass (1), Binoculars (1), Stand-by objects (1), Sowing seeds in a flower garden (1), Rainbow (1), More than one windows (1), Raindrops (1), Hypocrite (1), Story (1), Teacher with no effect on the class (1), Sapling (1), Mother-in-law (1), River (1), Company employees (1), Food (1), First impression (1).	6.6
7	Requiring analyzing	13	Puzzle (2), Building (2), Pomegranate (1), Russian dolls (1), Geometrical motif (1), Rosery (1), Ice-cream (1), Dominoes (1), Abacus (1), Tailor (1), Building a dam (1)	5.4
8	Answers suiting the question	10	Love (1), Tabula rasa (1), Empty glass (1), Recipe (1), Cooking (1), Playing bingo (1), Trying to grow the ripest watermelon (1), Life (1), School (1), Stomach (1).	4.1
9	Rote memorization	7	School road (1), Memorizing phone numbers (1), Work of art (1), Parrot (1), Encyclopedia (1), Computer (1), Constitution provisions (1).	2.9
10	No choices	6	Mine field (1), A gift from someone (1), TRT (1), Guest dinner (1), Broken tv antenna (1), Male shoes (1).	2.5
11	Uncertainty	6	Easter egg (1), English words (1), A philosophical word (1), Life (1), Joke (1) Chess (1)	2.5
12	Chance Success	1	National lottery (1),	0.4
13	Number of questions	1	Gloves (1)	0.4

"Classical open-ended question exam is like a nightmare, because we want to wake up immediately. We also want classical open-ended exams to go by immediately" (S143).

"Classical open-ended question exam is like a tunnel of horror, because I panic when I see the questions and can't remember all the answers" (S163).

"Classical open-ended question exam is like a boxer, because the strongest punch to students are thrown by open-ended questions" (S10).

Category 4: Written Expression Skills

There are 26 metaphors in this category. Pre-service classroom teachers define classical open-ended question exams as written expression. The explanations for the metaphors in this category are as follows:

"Classical open-ended question exam is like a mirror, because the students reflect what they know and their interpretations through their own expressions" (S68).

"Classical open-ended question exam is like building, because the students build their answers by organizing their own expressions" (S158).

Category 5: Easy to Prepare, Difficult to Score (Practicality)

There are 18 metaphors in this category. Pre-service classroom teachers define classical open-ended question exams as easy to prepare and difficult to score. The explanations for the metaphors in this category are as follows:

"Classical open-ended question exam is like tea, because you wait for the tea to brew. Similarly, you can write open-ended questions easily, yet the assessment takes time" (S9).

"Classical open-ended question exam is like painting, because we need to spare time to painting if we want to create something good. Open-ended questions need time to score" (S20).

"Classical open-ended question exam is like a bicycle, because they are easy to ride, yet tiring as it requires effort. Similarly,

open-ended questions are easy to write, yet tiring and difficult to score" (S46).

Category 6: Subjective Scoring

There are 15 metaphors in this category. Pre-service classroom teachers define classical open-ended question exams as subjective scoring. The explanations for the metaphors in this category are as follows:

"Classical open-ended question exam is like binoculars, because everyone looking through sees the answers differently. The results may change depending on the examiner or the examinee" (S59).

"Classical open-ended question exam is like a raindrop, because everyone's opinion and answer of the question is different" (S95).

"Classical open-ended question exam is like a story, because somethings are certain, yet the liking may differ from person to person. No matter how correct the answer given is, it may not be enough for the examiner" (S144).

Category 7: Requiring Analyzing

There are 13 metaphors in this category. Pre-service classroom teachers define classical open-ended question exams as meronym therefore analysis. The explanations for the metaphors in this category are as follows:

"Classical open-ended question exam is like a puzzle, because we present our fragmental knowledge as a whole as we answer the questions" (S15).

"Classical open-ended question exam is like a pomegranate, because while each aril represents higher-level thinking skills, such as organization, analysis, synthesis and evaluation, the pomegranate as a whole including all these represents the classical open-ended question exam" (S17).

"Classical open-ended question exam is like a geometrical motif, because patterns come together to form motifs. The answers to open-ended questions are also formed this way" (S94).

Category 8: Answers Suiting the Question

There are 10 metaphors in this category. Pre-service classroom teachers define classical open-ended question exams as answers suiting the question. The explanations for the metaphors in this category are as follows:

"Classical open-ended question exam is like tabula rasa, because we can fill in the table if we give suitable answers" (S36).

"Classical open-ended question exam is like the stomach, because we need to send food to stomach that is suitable to our health" (S197).

"Classical open-ended question exam is like life, because we can live the life the fullest when we do good things, just as we can get good scores if we fill the exam paper with suitable answers" (S91).

Category 9: Rote Memorization

There are 6 metaphors in this category. Pre-service classroom teachers define classical open-ended question exams as requiring rote memorization. The explanations for the metaphors in this category are as follows:

"Classical open-ended question exam is like a parrot, because there is no other way but memorizing in order to answer open-ended questions" (S146).

"Classical open-ended question exam is like an encyclopedia, because the answers to open-ended questions are based on rote memorization" (S170).

"Classical open-ended question exam is like a computer, because you have to memorize the information and store it in your memory" (S176).

Category 10: No choices

There are 6 metaphors in this category. Pre-service classroom teachers define classical open-ended question exams relating to their offering no choices. The explanations for the metaphors in this category are as follows:

"Classical open-ended question exam is like TRT, because in the past, everybody had to watch TRT since they had no other choice" (S181).

"Classical open-ended question exam is like a broken TV antenna, because we have to watch just one channel as we have no other options" (S182).

"Classical open-ended question exam is like having dinner as a guest, because you have to accept what is offered with no chance to decline or choosing" (S172).

In relation with the third and fourth sub-questions of the research, the metaphors produced by the pre-service classroom teachers for multiple-choice exams and the categories in which these metaphors are collected are given in the table below.

As presented in Table.2, the total of 240 metaphors produced by the pre-service classroom teachers related to the multiple-choice exams are grouped under 10 categories. Among these categories, most categories (28.8%) were produced related to offering choices feature of multiple-choice exams. This is followed by chance success (20.4%), being made of options (16.6%) and one correct answer (15%) categories. The least metaphors were produced for length of questions (0.5%) and level of difficulty (1%) categories.

Category 1: Offering Choices

There are 69 metaphors in this category. Pre-service classroom teachers define multiple-choice exams as offering choices. The most frequently repeated metaphor in this category was "fork in a road". The explanations for the metaphors in this category are as follows:

"Multiple-choice exam is like a fork in a road, because you encounter cases when you have to make preferences, and you have to choose" (S43).

"Multiple-choice exam is like a menu, because you have to choose between many choices" (S27).

"Multiple-choice exam is like an intersection, because you have to choose a way" (S120).

Category 2: Chance Success

There are 49 metaphors in this category. Pre-service classroom teachers define multiple-choice exams as offering chances. The most frequently repeated metaphors in this category were "game of chance" (7) and "national lottery" (5). The explanations for the metaphors in this category are as follows:

"Multiple-choice exam is like lottery, because if you are in luck, you can find the correct answer" (S93).

"Multiple-choice exam is like a game of chance, because sometimes you cannot know where to find the correct answer. You see, remember, but the rest is luck" (S132).

"Multiple-choice exam is like numerical lottery, because you have the chance to find the correct answer, even if you don't know" (S160).

Table 1. *The distribution of "classical open-ended question" related metaphors by categories*

Rank No	*Categories*	*f*	Metaphors	%
1	Offering choices	69	Fork in a road (4), Menu (2), Intersection (2), Shopping (2), Making combines (2), Wardrobe (2), Healthy diet (1), Making friends (2), Five different houses (1), Marriage show (1), Colorful small lokums (1), Color chosen by the painter (1), Clothing in accordance with weather (1), Rainbow (1), Being choosy in eating (1), Choosing the doctor (1), Balanced diet (1), Crossword puzzle (1), Car ride (1), Getting out of the well (1), Guidance (1), Life (1), Fork with five roads (1), Watermelon (1), Dress liked while shopping (1), Buying shoes (1), Color candy (1), Grocery shopping (1), Picking fruit from tree (1), Fishing (1), Choosing a rose from a rose garden (1), Loves me loves me not (1), Emergency numbers (1), Market shopping (1), Bazaar shopping (1), ÖSS preference period (1), Decisions made in life (1), Picking tomatoes at a grocery (1), Building for sale (1), Market (1), Picking the ripest watermelon (1), Open buffet (1), Listening to music (1), Shoe seller with four options (1), Having to choose between playing and studying (1), Building with five doors (1), Typewriter (1), Picking ingredients for a delicious dish, Bookshelf (1), Buying vegetables instead of fruit (1), Crossroads (1), Finding the good apple among the rotten (1), buying coke (1), Friend (1), Drinking mint and lemon tea when you have the flu (1), choosing a lover (1), choosing a spouse (1), means of communication (1), picking the rotten apple (1), eating (1).	24.5
2	Chance success	49	Lottery (5), game of chance (7), Numerical lottery (4), Dart (3), Betting (2), Wheel of fortune (1), Musical instrument (1), Playing backgammon (1), Playing marbles (1), Elevator (1), Claw machine (1), Surgery (1), Choosing friends (1), Watermelon (1), Billiards (1), Buying melon from the grocery (1), Gift (1), Bus (1), Archery (1), Pasta (1), Daily life (1), Clearance (1), Photo shot (1), A sea where we can dive-in eyes closed (1), Last step to the golden medal (1), Mother (1), A song, the lyrics of which you don't know well (1), Leavening a lake (1), Bazaar shopping (1), Facebook (1), The straight path (1), Dish of nuts (1), Missing pieces of a puzzle (1).	20.4
3	Being made-of choices	40	Life (3), Friend (2), Labyrinth 2), Bag (2), Food (1), Holiday journey (1) Bazaar stand (1), Tree with many branches (1), Life problems (1), Grocery (1), Dart (1), Clothes (1), Open buffet breakfast (1), Car parts (1), Pasta (1), University (1), Web site (1), Key chain (1), Puzzle (1), Chameleon (1), Different paths (1), Typewriter (1), Fridge (1), Keyboard (1), Train (1), Russian roulette (1), Tv channels (1), Tree (1), Women's shoes (1), Five-unit power socket (1), Raffle (1), Foundation (1), Seasons (1), Dish of mixed nuts (1), mixed vegetable pot (1).	11.2
4	One correct answer	36	Love (2), Shooting a basket (2), Crossword (2), elephant trunk (1), shoes with hook and loop fastener (1), Elevator (1), Puzzle (1), Single window (1), Friendship (1), Library (1), Cash register (1), clutch pedal (1), Tea cup (1), Sun (1), Chess (1), Dot (1), Scales (1), Mailman (1), Grandchild (1), Fruit basket (1), Seesaw (1), Critical point (1), Five racing horses (1), Woman wearing no make-up (1), Lock (1), Train ride (1), Radar (1), Contest (1), Zip (1). Forest (1), Locked door (1), Logic (1), Bus stop (1).	10.8
5	Making feel happy and comfortable	18	Exotic mango ice-tea (1), PJ (1), Cotton candy (1), Sleep (1), Having health Check-up (1), Shopping at the market (1), Drinking cold water (1). Bird (1), A sunny day (1), Novel read with interest (1), Meeting the lover (1), Chocolate (1), Solving crosswords (1), Cologne (1), Lover (1), Breathing (1), Etliekmek (quick bread with ground meat layer on top) (1), An old friend we meet (1).	7.5
6	Difficult to prepare, easy to score (practicality)	15	Stuffed vine-leaves (1), Car (1), Composing (1), Karnıyarık (split eggplant with meat filling) (1), Building a house (1), Cooking (1), sliding down the slide (1), Tree producing fruit (1), Catching and eating fish (1), Playing the piano (1), Making a cake (1), Bee making honey (1), Potato chips (1), Apple tree (1), Iron (1).	6.6
7	Limited to choices	5	Country (1), Being jailed (1), Multistorey apartment (1), Garden with borders (1), Sea (1).	5.4
8	Meronymy	4	Pomegranate (3), Putting up curtains (1).	4.1
9	Level of difficulty	2	Chameleon (1), Mixer(1).	2.9
10	Length of questions	1	Spring (1).	2.5

Category 3: Being Made of Choices

There are 40 metaphors in this category. Pre-service classroom teachers define multiple-choice exams as being made of choices. The explanations for the metaphors in this category are as follows:

> *"Multiple-choice exam is like labyrinth, because just like the multiple-choice exam, you have many road options in labyrinths" (S124).*
>
> *"Multiple-choice exam is like life, because in life we encounter with many options" (S178).*
>
> *"Multiple-choice exam is like a bag, because there are a lot many options" (S102).*

Category 4: One Correct Answer

There are 36 metaphors in this category. Pre-service classroom teachers define multiple-choice exams as having one correct answer. The explanations for the metaphors in this category are as follows:

> *"Multiple-choice exam is like love, because we find the only correct among many distractor options" (S87).*
>
> *"Multiple-choice exam is like shooting a basket, because if the ball goes through the basket, you win, if it doesn't, you can win or score. There is only one and certain answer in multiple-choice exams" (S94).*
>
> *"Multiple-choice exam is like a crossword puzzle, because there is only one correct answer" (S122).*

Category 5: Making Feel Happy and Comfortable

There are 18 metaphors in this category. Pre-service classroom teachers define multiple-choice exams in accordance with their feelings. The explanations for the metaphors in this category are as follows:

> *"Multiple-choice exam is like PJs, because even hearing of it makes you feel comfortable and happy" (S38).*
>
> *"Multiple-choice exam is like exotic mango ice-tea, because even if you don't know the answer, it is somewhere in front of your eyes. This provides a great relief" (S30).*
>
> *"Multiple-choice exam is like sleep, because I don't feel stress, and I feel comfortable" (S169).*

Category 6: Difficult to Prepare, Easy to Score (Practicality)

There are 15 metaphors in this category. Pre-service classroom teachers define multiple-choice exams as difficult to prepare, easy to score. The explanations for the metaphors in this category are as follows:

> *"Multiple-choice exam is like stuffed vine leaves, because both take a long time to prepare, and scoring multiple-choice exams takes a very short time just like eating the stuffed vine leaves" (S185).*
>
> *"Multiple-choice exam is like composing, because composing takes days, but once it is composed, it can easily be sung. Preparing multiple-choice exams is also difficult and time consuming. On the other hand, assessing is easier" (S49).*
>
> *"Multiple-choice exam is like playing the piano, because learning to play the piano is difficult and time consuming but playing is easy after you learn it" (S97).*

Category 7: Limited to Choices

There are 5 metaphors in this category. Pre-service classroom teachers define multiple-choice exams as limited to choices. The explanations for the metaphors in this category are as follows:

> *"Multiple-choice exam is like being jailed, because you are jailed between choices, which affects your thinking liberty directly" (S151).*
>
> *"Multiple-choice exam is like a garden with borders, because you have no choices but the offered ones" (S188).*
>
> *"Multiple-choice exam is like a sea, because seas are limited. We're also limited with choices in what is expected from us" (S193).*

Conclusion, Discussion and Suggestions

In the present research, pre-service classroom teachers produced a total of 240 metaphors related to the open-ended question exams. The most frequently produces metaphors by pre-service classroom teachers respectively were; cooking (4), nightmare (4), ocean (3), and mirror (3). These metaphors were collected under 13 categories. Among these categories, most metaphors were produced under "freedom in answering" (24.5%), "requiring knowledge" (20.4%), "negative association" (11.2%) and "written expression skill" (10.8%) categories. The least number of metaphors were under "number of questions" (0.4%) and "chance success" (0.4%) categories. Open-ended question exam related metaphors produced by pre-service classroom teachers for the present research are similar with metaphors produced for the similar studies in the related literature. For this reason, we can claim that pre-service classroom teachers have knowledge of this examination type. Additionally, considering the negative metaphors produced by pre-service classroom teachers on this type of examinations, it can be claimed that this type is not preferred by them. Kılıç & Çetin (2018) reported in their studies that the more examination anxiety the students had, the less they preferred open-ended questions. This finding is in agreement with the negative association category of the metaphors related to open-ended question exams.

In the present research, pre-service classroom teachers produced a total of 240 metaphors related to the multiple-choice exams. The most frequently produced metaphors by pre-service classroom teachers respectively were; game of chance (7), lottery (5), fork in a road (4), numerical lottery (4), dart (3), and life (3). These metaphors were collected under 10 categories. Among these categories, most metaphors were produced under "offering choices" (28.8%), "chance success" (20.4%), "being made-of choices" (16.6%) and "one correct answer" (15%) categories. The least number of metaphors were under "length of questions" (0.5%) and "level of difficulty" (1%) categories. As can be observed from the metaphors, pre-service classroom teachers tried to define different characteristics of multiple-choice exams by producing different metaphors. 196 of the 240 metaphors were repeated only once. In accordance with these findings, we can claim that multiple-choice exams arouse different feeling and opinions among pre-service classroom teachers. Taking the happy and comfortable feeling category into consideration, we can claim that pre-service teachers have positive feelings about this exam type. Sarıgül (2009) reported in their study that multiple-choice exams are well-known by students, and therefore they have positive feelings about this exam type. In their research, Kılıç & Çetin (2018) found that the most preferred exam type by students was multiple-choice exams. Anıl & Acar (2008) reported in their study that the most frequently used traditional assessment tool by classroom teachers was multiple-choice exams. Additionally, the categories formed in the study conducted by Tunç and Uluman (2018) in order to define pre-service teachers' perceptions of multiple-choice exams, were in agreement with the categories formed in the present research, such as chance factor, single answer, and limitations.

In accordance with these findings, we can claim that metaphors produced by pre-service classroom teachers are cognitive tools for presenting their perspectives of these exam types. For this reason, it can be suggested that metaphors can be used a tool to define students' feelings and thoughts about a practice, an incident, a concept and a course, etc.

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Promotion of the Environmental Knowledge and Behavior through the Moroccan Syllabus of Sciences in the Middle School

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Abstract

This research paper aims to promote environmental knowledge and behavior in the Moroccan school through the syllabus of science at the level of the Moroccan middle School. As a first step, a comparative multi-case study was conducted. It is intended for students from four middle Schools who belong to four different socio-environmental backgrounds. The survey was conducted through questionnaires which consist of four sections; the learning methods, the teaching aids, environmental knowledge, and the use of environmental knowledge in adequate eco-responsible behaviors. Based on the analysis of the results obtained at the level of the four schools, a teaching intervention of four weeks (2 hours per week) was then carried out. During this process, the same program was taught but otherwise. In order to meet the objectives of this work, we have inserted some local environmental problems through active learning methods and relatively appropriate teaching aids. In our intervention, we have made the necessary link between ecological knowledge and the appropriate pro-environmental behavior. This, however, is attributed to the fact that it has never been used before. The results show that there is a significant improvement, both in terms of environmental knowledge acquired and the intentions to adopt eco-friendly environmental behaviors.

Keywords: Environmental Knowledge, Environmental Behavior, Middle School, Active Learning, Local Environment

Introduction

The future of societies and their development are very closely related to their relationship to the environment (Declaration, 1992). This relationship is the subject of any environmental education (EE). According to several authors, education is the key element in the prevention and resolution of environmental problems (Makki, Abd-El-Khalick, & BouJaoude, 2003; Tuncer, Ertepinar, Tekkaya, & Sungur, 2005).

According to studies conducted in Turkey (Özdem, Dal, Öztürk, Sönmez, & Alper, 2014; Tuncer, Sungur, Tekkaya, & Ertepinar, 2007), middle school students stated that school is among the main sources of information in regards to various environmental problems (climate change) (cited by Higde, Oztekin, & Sahin, 2017). Also, (Erten, 2005; Karataş, 2011; Keles, Uzun, & Varnaci- Uzun, 2010; Miser, 2010; Samur, 2018) argued that nature education programs have a significant impact on individual environmental awareness, attitudes, and behaviors. Esa (2010) emphasized that teachers are the most influential ones in educating children and adolescents to become tomorrow's leaders in environmental advocacy. However, the knowledge and skills of teachers (Akçalı & Demircioğlu, 2017), the choice of teaching methods (Mikerova, Sergeeva, Mardirosova, Kazantseva, & Karpenko, 2018) and teaching aids (Acar, Tertemiz, & Taşdemir, 2018) significantly influence the quality of learning.

Regarding learning methods, active learning is generally defined as any teaching method that "engages students in the learning process" (Bonwell & Eison, 1991, p. 5; Collins & O'Brien, 2011, p. 23). This type of learning requires students to engage in meaningful learning activities and reflect on what they are doing. This is the opposite of traditional methods centered on the transmission of the same content and passivity of students (dogmatic method, interrogation-response method). The key element of active learning is the active involvement of the learner (VanWinkle, Davis, & Larwood 2002). Consequently, active learning exists based on the recommendations of Felder, Woods, Stice and Rugarcia (2000). It is also one of the "seven principles of good practice" by Chickering and Gamson (1987). However, under the active learning label, there are different teaching methods that are best evaluated separately (Prince, 2004).

Active learning methods have been widely studied and recognized to have a positive significant effect on student outcomes including working in small groups (D. W. Johnson, Johnson, & Smith, 1998; Norman & Schmidt, 2000; Silberman, 1996; and others), collaborative learning (Felder et al., 2000; Johnson et al., 1998; Prince, 2004), the problem-solving method (Bonwell & Eison, 1991; Norman & Schmidt, 2000). Problem-based learning is often associated with another active method which is learning through discovery (Goldberg & Nagurka, 2012; Mayer, 2004; Prince & Felder, 2006). Discovery learning can be defined as "An instructional approach that encourages students to learn through their own exploration, experience, and inquiry. Learning typically proceeds from identification of a problem, through development, and testing of hypotheses, to drawing a conclusion" (Collins & O'Brien, 2011, p. 160). In this process, the teacher is "a facilitator rather than an instructor, and it is their role to organize a rich or appropriately resourced learning environment and to encourage the learner's self-directed curiosity and prob-

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lem-solving skills, rather than to demonstrate or provide 'correct' answers or procedures" (Wallace, 2015). Furthermore, other active learning methods can be found such as dialogue method (Alexander, 2001, 2006; Do, 2003; Muhonen, Rasku- Puttonen, Pakarinen, Poikkeus, & Lerkkanen, 2016). It is introduced by Paulo Freire, in which teachers engage learners in discussion to understand their perceptions and experiences (Collins & O'Brien, 2011). Dialogic teaching harnesses "The power of talking to stimulate and develop students' thinking, learning and understanding" (Alexander, 2001). Dialogic interactions are defined as "exchanges where students ask questions, explain their points of views and make comments about each other's ideas. The crux of dialogue is to exchange ideas that prompt further questions" (Alexander, 2006; Quoted by Muhonen et al., 2016).

The "demonstrative method" (Ameh, Daniel, & Akus, 2007; Ekeyi, 2013; Kresta, 1998) refers to the type of teaching method in which:

> The teacher is the principal actor while the learners watch with the intention to act later. Here the teacher does whatever the learners are expected to do at the end of the lesson by showing them how to do it and explaining the step-by-step process to them. (Quoted by Ekeyi, 2013, p. 2).

In the end, active learning can include other methods such as experiential learning (Karpudewan & Mohd Ali Khan, 2017), and the project-based learning method (Bordallo & Ginestet, 2006; Hartmann, Näf, & Reichert, 2011; Huber, 2005).

Consequently, the field of EE is largely influenced by active learning methods, which was the reason we found more or less the same methods recommended in EE. This aims to improve knowledge, values, attitudes, and behaviors towards the environment. Genc (2015, p.2) states that active learning methods must be implemented to achieve effective EE. Leeming, Porter, Dwyer, Cobern and Oliver (1997) and Cheong (2005) reported that teaching methods that encourage more active student engagement helps in improving students' environmental attitudes and conceptual understanding.

In addition to the methods already mentioned, studies in EE have stressed the importance of visits and field trips cognitively, emotionally, physically, and morally (Ballantyne & Packer, 2005; Dori & Tal, 2000; Saribas, Kucuk, & Ertepinar, 2017, p. 9).

Active and effective learning requires the use of several teaching aids (Asokhia, 2009; Unesco, 2016, p. 215). Many studies have shown the importance of each of the teaching aids in improving learning as well as the factors influencing its use. Among the teaching aids used in sciences, and which are solicited by several authors, we noted the ICTE (Nafidil, Alami, Zaki, El Batri & Afkar, 2018; Norton, McRobbie, & Cooper, 2000; Sangra & González-Sanmamed, 2011; Wendt, Rockinson-Szapkiw & Cordes,2018) and the lab experiments (Aglan & Ali, 1996; Falk & Heckman, 2009). On the other hand, the excessive use of the textbook has provoked several criticisms (Adebayo & Adigun, 2018; Rodríguez & Paiva,2017). Asokhia (2009) linked the poor performance of students to the dominance of textbooks as the only teaching aid.

Research Questions

Based on this perspective, the study answers three research questions:

> 1. To what extent are the learning methods and teaching aids used in a science course as a good indicator of effective learning?
>
> 2. How do we effectively use some teaching aids such as images to help students acquire environmental knowledge (eg food chains) so as to improve their environmental behavior?
>
> 3. Is there a positive correlation between integrating local environmental issues into an ecological course of science and improving the acquisition of knowledge and increasing motivation to adopt pro-environmental behaviors?

Methodology

Research Design

Indeed, the choice of the studied institutions were oriented to reflect the main socio-economic cases whereby the student lives in Morocco. The study concerns four middle Schools; Two public middle schools in precarious environments, one rural and the other urban, and two other institutions belonging to a neighborhood of the middle and upper class, one private and the other public.

Intervention was administered to 3 experimental groups of first-year middle school students. The lessons were taken from the units of the official syllabus of the sciences of this same grade level (Directorate of Curricula, 2009).

A quasi-experimental design that is often used to evaluate the effectiveness of a treatment or an educational intervention due to the lack of random assignment (Falk & Heckman, 2009; Shadish, Cook, & Campbell, 2002). This design has been used as it is considered by several methodologists to be the most appropriate for studying the effectiveness of intervention in intact environments (Falk & Heckman, 2009; Shadish, Cook, & Campbell, 2002). Indeed, we cannot perfectly control all the variables that come across the teaching-learning situation and among other the initial characteristics of the groups studied. For this reason, the use of several control and experimental groups seems necessary. Thus, a lot of recent studies have used this same design in similar conditions (Fröhlich, Sellmann, & Bogner, 2013; Gottlieba, Vigoda- Gadota, & Haim, 2013; Karpudewan, Roth, & Abdullah, 2015; Karpudewan & Mohd Ali Khan, 2017).

Samples

Samples of the comparative study. From a population of 633 students from 4 different middle Schools, an exhaustive sample of 400 students (100 students per institution) was taken. We used the cluster sampling method because we have taken four middle schools that represent four different socioeconomic groups to which a Moroccan student can belong. All students, subject of the study, continue their studies in first year middle School. The sample studied comprises of 198 boys and 202 girls. For the three public middle school studied, we have about 40 students per class. On the other hand, the number of students does not exceed 27 for the private school. Among the three levels of middle school, the first-year program (object of study) contains the most important content related to the environment and can be exploited in the sense of environmental education.

Samples of the experimentation (the intervention) and the control. The experiment was carried out at the level of the public urban middle school of precarious environment that has low scores in terms of students' performance. For the three experimental samples, they consist of 61 volunteer pupils; 39 girls and 22 boys (Table 1). An experimental group of 21 students was treated in January-February 2017 and two other groups (20 students each) were treated in October-November 2017. For the 3 control groups, the same sample of the comparative study was used, (100 students with 45 boys and 55 girls) belonging to the same school (urban public of precarious environment).

Data Collection Tool

Data was collected using a four-component questionnaires that are as follows: an assessment of the learning methods used (10 items), teaching aids (6 items), environmental knowledge (5 items), and the use of environmental knowledge in eco-responsible behaviors (3 items). Items concerning the learning methods and teaching aids used were administered only to the comparative study samples (consists of 400 students). The items related to environmental knowledge were administered to all the samples studied (461 students), using the results of 100 students belonging to the precarious public school (comparative study) as a control for the results of the intervention carried out with other groups (61 students) from the same school (Table 8). The items concerning eco-responsible behaviors were reserved only for the three groups of the intervention (61 students).

Table 1. *Control and experimental sample for the intervention*

	Groups	*n*1 (boys)	*n*2 (girls)	Tot
Control sample (Regular sessions)	Gr1	20	20	40
	Gr2	17	23	40
	Gr3	8	12	20
	Tot	45	55	100
Experimental sample (intervention)	Gr1	7	14	21
	Gr2	6	14	20
	Gr3	9	11	20
	Tot	22	39	61

The items of the questionnaire have been reformulated several times, in collaboration with the research committee. This was done to ensure its reliability, clarity, and preciseness. The penultimate version of the questionnaire was tested beforehand with a group of 15 students. These students all belong to the same grade level as the experimental groups. The questions posed by these students, as well as their response, allowed us, once again, to rephrase some questions before reaching the final version of the questionnaire. The reliability index (Cronbach's alpha) applied to each component of the questionnaire gave the following values: 0.698 for learning methods, 0.687 for teaching aids and 0.764 for environmental knowledge, indicating that the internal consistency of the questionnaire is satisfactory.

Regarding the validity of the content of the questionnaire, the knowledge test questions are accurate and representative of all units of the environmental science program that are likely to be exploited in environmental education. This is what was done in the section on "the use of environmental knowledge in eco-responsible behavior". With regard to learning methods and teaching aids, in addition to our experience as science teachers, we have carefully explored the literature to identify the different learning methods and teaching aids that can be used in a science course. The responses collected giving a very low proportion to the section "other methods" and "other teaching aids" show that the main methods of learning and teaching aids are actually the ones we used. That constitutes an element of the validity of the contents of the questionnaire. Also, the discriminative power of the instrument was tested a second time one month after the data collection of the comparative study. This test was carried out at the level of the public urban middle school of the precarious environment and the private middle school. The results similar to those found during the first data collection were representing 90%. That is to say, there is still a significant predominance of private school, especially in terms of the active methods used and the diversification of teaching aids administered.

The questionnaire also benefited from the external validity provided by the latest report of the Higher Council for Education, Training and Scientific Research (Rapport CSEFRS, 2018) entitled "A School of Social Justice", of which the main focus was shed on educational inequalities between urban and rural areas on the one hand and between public and private schools on the other.

Data Collection

Learning methods, teaching aids and eco-responsible behaviors. We explored the different methods that can be used in a science course. In general, there are two families of learning methods: traditional (or dogmatic) methods and active methods (Arénilla, Gossot, Rolland, & Roussel, 2009, p. 194). The traditional methods tested are the lecture method (Dufresne, Gerace, Leonard, Mestre, & Wenk, 1996) and the interrogation-response method (Arénilla et al., 2009). For active methods that require active involvement of the learner, we proposed active dialogue, group work, demonstrative method, discovery method, field trips, and students' presentations and experimentations.

To find out what methods were used in each institution, we presented simple and clear definitions of each method (Table 2). However, we chose to propose them to 100 students from each institution instead of one teacher or two of the sciences that exist in each of these institutions.

To measure the frequency of the use of each learning method as well as teaching aids, the 5-point Likert scale was used; 0 point was awarded to "I do not know", 1 point to "not used", 2 to "rarely", 3 to "occasionally", and 4 to "often". Furthermore, Furthermore, this same scale was used to measure students' intentions (from the intervention sample) to use the knowledge (learned during the intervention sessions) in their daily lives and particularly in three areas: the economy in the use of water, the preservation of the near environment against pollution, and the preservation of the forest against fires.

Table2. *Examples of proposed learning methods*

(1) The teacher explains the lesson and the students listen without participation (dogmatic).
(2) Partial participation of students by answering some questions asked by the teacher. (Interrogation-response method)
(3) Dialogue method with active participation of students at all stages of the lesson.
(4) Group work method for performing works and assignments either inside or outside the classroom.
(5) Realization of laboratory experiments.
(6) Performing school outings to supplement and support environmental knowledge.

The diversification of learning sequences, as well as the use of a wide range of learning supports, constitutes effective teaching strategies (Asokhia, 2009; UNESCO, 2016, p. 214). To evaluate the diversification of teaching aids used, we measured the degree of the use of each of the following teaching aids: the textbook, Documents presented by the teacher, audio-visual and ICT, lab tools and samples.

Environmental knowledge test. The environmental knowledge test is taken from the official syllabus of the sciences of the first middle school year of Morocco (Directorate of Curricula, 2009). The themes in question are food chains and networks, factors of natural imbalances, components of the cell as a structural unit of the living being, and risks to water resources. Five specific questions have been se-

lected, all of which are part of the objectives of this syllabus. 2 points for each correct answer, 0 point for each false answer, and 1 point for each incomplete answer. For example, for the fifth question: Name 2 human-caused risks that threaten water resources. Students who cited a single risk had a single point. Students with an average grade of 5/10 or higher were counted. Thus, the test questions are as follows:

Table 3. *Environmental Knowledge Test Quesitons*

(1) Write correctly an example of a food chain.
(2) What are the living things by which food chains usually start (the first link)?
(3) Name three factors which are responsible for natural imbalances.
(4) The cell is the structural unit of living beings. Name its main constituents.
(5) Name two human-related hazards that threaten water resources.

Table 4. *Units and objectives of the intervention*

Units	Objectives	Duration
1. The cell, structural unit of the living being	• Identify the cell as a structural unit of the living being and discover its main components: the nucleus, the cytoplasm, and the cytoplasmic membrane.	2h
2. Chains and food webs	• Observation and analysis of food relations in a natural environment to discover the concepts of food chains and networks.	2h
3. The natural balances	• Identify aspects of a balanced environment and discover the factors causing natural imbalances. • Deduce behaviors that contribute to maintaining the ecological balance.	2h
4. Risks threatening water resources	• Identify the main threats to water resources and some of their consequences. • Deduce the eco-responsible behaviors towards the water.	2h

Data Analysis

It is a mixed research with qualitative phases and quantitative phases. The qualitative phase is manifested in the study of four particular cases of school and taking into account several interrelated variables in a complex context (Sauvé, 1999, p. 13). These variables are student performance, learning methods, teaching aids, and number of students per class. Also this qualitative phase was used to extract the pro-environmental behaviors from a preliminary analysis of the syllabus of the sciences.

To compare the data of the 4 cases studied and the intervention, we used some of the quantitative methods. This is particularly the case of the descriptive statistics for the percentages of the values of each variable studied, the correlations between these variables and the variance Analysis Tests (ANOVA). The statistical measurements were performed using IBM SPSS20 statistical software.

Results and Discussions

Learning methods

Figure 1 shows a clear predominance of the private middle School regarding the use of different active methods (often or occasionally) such as the discovery method (92%), laboratory experiments (81%), demonstrative method (82%), ICT (81%), active dialogue (77%), teamwork (73%), school outings (74%), etc. Whereas the traditional dogmatic method was declared to be weakly used in this same private establishment (35%). On the other hand, the same method (dogmatic) is more used in the three public schools studied (more than 50%). School outings are very poorly used in all public middle Schools studied (8 to 29%), while they are well represented at the private school level (74%). The demonstrative method through the ICTE is also weakly used at the level of rural and urban public middle Schools of the precarious environment.

The calculation of the average of the percentages of the active methods used in each of the four establishments revealed a high application of these methods at the level of private school (77.5%), a moderate application in the public middle School of the city centre (59.25%), and a low use of these methods at the level of public rural and precarious schools (46.87% and 44.87% respectively).

Table 6 shows very significant correlations between the school variation and the variation in methods used. In fact, the methods that are used with very significant differences between the schools studied are active dialogue, discovery method, student presentations, demonstrative methods, laboratory experiments and School outings. These are all active methods associated primarily with private school and to a lesser extent with the school located in downtown. This is due to a considerable deficiency in the laboratory experience and environmental exits in this school. The dogmatic method is significantly correlated with the three public schools. It is also noted that the interrogative method is the only one that has not shown any significant difference in its use among the schools studied (Table 6).

The application of Spearman's correlation between the degree of use of the active methods and the results of the knowledge test confirmed the existence of a significant positive correlation between the administration of these active methods and the students' grades (the correlation coefficient is equal to 0.282 with a significance at the 0.01 level). This implies that the active methods are highly recommended to improve learners' achievement. On the contrary, dogmatic method is negatively correlated with the learner's outcome.

In the literature, there are several works testifying to the inescapable impact of active learning methods on the significant improvement of learning and academic performance (Bonwell & Eison, 1991; Dufresne et al., 1996; Felder et al., 2000; Karpudewan & Mohd Ali Khan, 2017; Prince, 2004; Silberman, 1996; VanWinkle et al., 2002). These methods put the learner at the core of the educational action through which he/she is offered means to become an active player in the learning process. According to the results obtained, the frequent use of active learning methods can be said to be an indicator of effective learning, especially when these methods are used with a staff of not more than 25 students.

Teaching Aids

Figure 2 shows that the most frequently used teaching aid in all public institutions studied is the textbook (between 62% and 69%). However, in the private school, the textbook arrives exactly at the last position (13%), i.e. it is substituted by other teaching aids, and in particular the documents prepared by the teacher (83%), the ICT (68%), the samples (52%), and the laboratory tools. All these teaching aids are well represented quantitatively.

Table 7 shows very significant correlations between the schools studied and the teaching aids used. These correlations are, mainly, due to the very significant differences between the private school and the three public schools

Table 5. *Methods, learning activities and teaching aids*

Units	Objectives	Duration
1	• Experimental method and group work: Using a teacher's demonstration, the students discovered the components of the light microscope, how it is used, and the method of performing a microscopic preparation. Working in groups (4 per group), students made microscopic preparations of onion epithelium and oral epithelium; then they observed them by microscope and they drew a cell of each of the two tissues. Students compared the components of the two cell types to deduce the 3 main components of a cell; the nucleus, the cytoplasmic membrane, and the cytoplasm. By using computer images projected by data show, students observed other animal and plant tissues to conclude that the cell is the structural unit of the living being. - Oral evaluation and recapitulation.	• Optical microscopes • Slide and cover slip • Dyes (methylene blue and neutral red) • Onions • Computer and • Data show
2	• Demonstrative method: From the observation of the image of a natural environment, the students analyzed the food relations existing between the living beings of this environment and, following the instructions (demonstration), they wrote simple food chains correctly. From the observation and analysis of several food chains, which students wrote on the board, they deduced that: - Plants are the first link in all food chains. - Existing food chains in an environment are linked and intertwined to form a food web. - Evaluation: From several series of images of anonymous and disorderly living beings (multimedia resource), each student rearranges a series of images to build a food chain. - Oral recapitulation.	• Computer • Data show • Digital resources: images of natural environments, several series of images of anonymous and disordered living beings to form food chains
3	• Group work method and discovery: One week before this lesson, the students of the 3 experimental groups were asked to prepare research in groups of 3 people. Research is focused on natural balances and natural imbalance factors. After selecting the 2 best searches by class, the selected students exposed their research and at the same time, the others took notes according to a grid drawn on the board. The students filled the grid consisting of 3 columns: the aspects of a balanced environment, the factors of natural imbalance, and their consequences. Based on the observation of some shocking images relating to the factors of ecological imbalances (fire, pollution and overexploitation of natural resources), the students were invited to draw from each image the eco-responsible behaviours that contribute to maintaining the ecological balance. - Oral evaluation and recapitulation	• Student research •Images of natural environments and ecological imbalance factors • Computer • Data show
4	• Discovery method: To discover the main risks threatening water resources, two local examples were used. The first concerns the pollution of the river "Sebou", the second example concerns the total drying of Lake "Dayet aoua" (47.9 km south of the city of Fez). Students are asked to interview their families (parents and grandparents) on 2 questions: 1- Identify the fish species that disappeared from the "Sebou" River and determine the causes of their extinction. 2- Identify the causes of the total drying of Lake "Dayet aoua". The student responses were supported by images of the pollution of the river "Sebou" and images of the extirpated specie. From the analysis of these 2 local examples, students deduced the need to adopt certain eco-responsible behaviors. - Evaluation and recapitulation.	•Images of water pollution •Pictures showing water wastage •Image of the extinct species (the Alose) •Student research •Computer •Data show

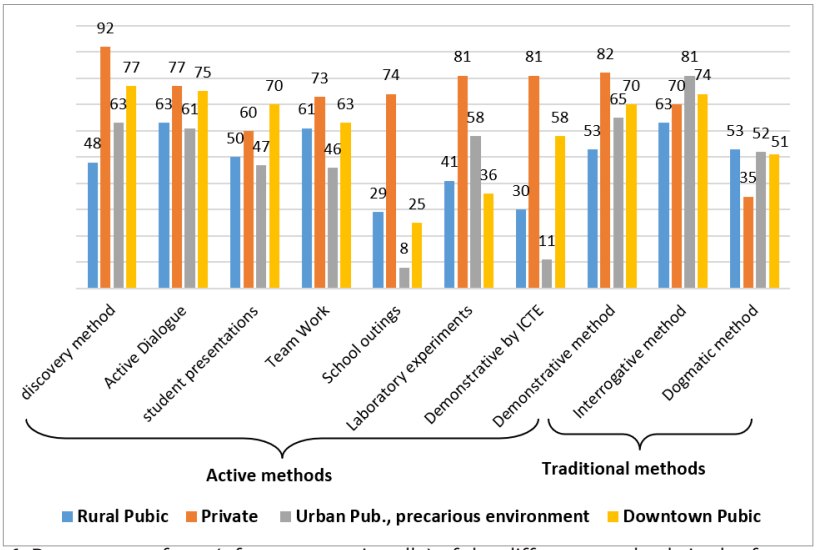

Figure 1. Percentage of use (often or occasionally) of the different methods in the four schools

Table 6. *Spearman's correlation between the school variation and the variation in methods used*

		Dogmatic method	Interrogative method	Active Dialogue	Team Work	Discovery Method	Student Presentations	Demonstrative method	Demonstra-tive by ICTE	Lab. experiments	School outings
Schools	Correlation Coefficient	-.122*	.062	.187**	.125*	.350**	.154**	.247**	.477**	.245**	.402**
	Sig. (2-tailed)	.015	.216	.000	.013	.000	.002	.000	.000	.000	.000
	N	400	400	400	400	400	400	400	400	400	400

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

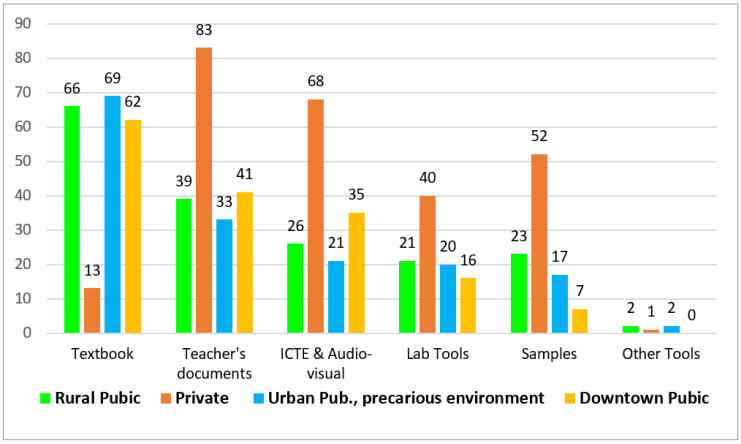

Figure 2. Percentage of different teaching aids often used

Table 7. *Correlation between schools and teaching aids used*

			Textbook	Teacher's documents	ICTE & Audio-visual	Lab Tools	Samples	Other Tools
Spearman's rho	Schools	Correlation Coefficient	-.399**	.305**	.334**	.199**	.194**	-.234**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
		N	400	400	400	400	400	400

** Correlation is significant at the 0.01 level (2-tailed).

Table 8. *Percentage of students who have scored the average and more in the environmental knowledge test after regular learning sessions (no intervention)*

Middle School	*N* students	n_1 boys	n_2 girls	% Students who obtained the aver-age and more
Rural Public	100	56	44	31%
Urban Pub., precarious environment	100	45	55	37%
Downtown Public	100	50	50	38%
Private	100	47	53	74%

concerning all the teaching aids used. However, there are no significant differences between the three public schools regarding the use of textbooks, teacher's documents and laboratory tools. Admittedly, there was a small significant difference between the downtown public school and the urban precarious school about the use of ICT and audio-visual materials. Also, there is another small significant difference between the downtown public school and the rural public school regarding the use of samples. However, the use of these teaching aids remains significantly low in these public schools in comparison with the private school.

It is important to mention that the various teaching aids used in science course reveal an important pedagogical effort on the part of the teachers, which contributed to a better success in the private school. On the other hand, the excessive use of a single teaching aid (the textbook) has a negative correlation with student's performance (Table 8 and Figure 2). Besides, the number of students per classroom is an important factor in learning achievement (about 25 in the private school and around 40 in the three public middle Schools).

In addition, countless studies have been carried out on the ICT and their indisputable contribution to several levels of learning, such as their contribution to the significant improvement of student performance (Nafidi, Alami, Zaki, El Batri & Afkar, 2018; Sangra & González-Sanmamed, 2011; Wendt, Rockinson-Szapkiw & Cordes,2018). The excessive use of textbook has given rise to several criticisms (Adebayo & Adigun, 2018; Rodríguez & Paiva,2017). It can be concluded that the use of the textbook as the only teaching aid in sciences lessons is a good indicator of less effective learning. This is reflected in the poor performance of students (the case of the three public middle Schools studied). In contrast, the diversification of the teaching aids used can constitute a criterion of good student performance (case of the private school and the 3 groups subject of our intervention). This can be seen in the case where the teaching aids are used with active learning methods and a reduced number of students (around 25).

Test of Environmental Knowledge

Results of the test. Concerning the percentage of students who have scored the average and more in the test of environmental knowledge, it is conspicuous (Table 8) based on the pervasiveness of the private middle school (74%). The urban precarious middle school and the urban middle school at downtown were ranked second with the percent-

age of 37% and 38% respectively. Finally, only 31% of rural public middle school students were able to pass this test.

The analysis of variance (ANOVA, Table 9) showed a very significant difference between the results of the students of the private school and those of the public institutions studied. The same analysis, however, does not reveal any significant discrepancy among the three public schools. Therefore, the ANOVA applied to the participants' grades provides two distinct categories. The first category represents the private school, while the second category puts together all the three public schools. Analysis of the previous results revealed a positive correlation between the use of active learning methods, diversification of teaching aids, and student performance.

Table 9. *Analysis of variance (ANOVA) with multiple comparisons of the scores achieved in the four institutions*

Middle School	*N* students	Mean Difference	Sig.
Rural Public Middle School	Urban Pub., precarious environment	-.01000	.979
	Downtown public M. S.	.01000	.979
	Private Middle School	-2.23000*	.000
Urban Pub., precarious environment	Rural Public Middle School	.01000	.979
	Downtown public M. S.	.02000	.958
	Private middle School	-2.22000*	.000
Downtown Public M. S.	Rural public middle School	-.01000	.979
	Urban Pub., precarious environment	-.02000	.958
	Private middle School	-2.24000*	.000
Private Middle School	Rural public middle School	2.23000*	.000
	Urban Pub., precarious environment	2.22000*	.000
	Private middle School	2.24000*	.000

*. The mean difference is significant at the 0.05 level.

Table 10. *The environmental knowledge test done before (pre-test) and after (post-test) the intervention and the regular sessions*

	Groups	*N* (students)	n_1 (boys)	n_2 (girls)	Students Who Have got Their Average			
					Pre-test		Post test	
					n	%	n	%
Control sample (Regular sessions)	Gr1	40	20	20	0	0	14	35
	Gr2	40	17	23	1	2.5	18	45
	Gr3	20*	8	12	0	0	5	25
	Tot	100	45	55	1	1	37	37
Experimental sample (inter-vention)	Gr1	21	7	14	1	4.76	20	95
	Gr2	20	6	14	0	0	20	100
	Gr3	20	9	11	0	0	20	100
	Tot	61	22	39	1	1.64	60	98

20* : This class contains 41 students who carried out their regular classes, but the knowledge test involved only 20 students who were randomly selected to complete the one hundred students initially set.

Table 10 shows that both control and experimental groups students had almost the same results in the knowledge test before the intervention. That is to say, before learning the test units, the pre-test revealed a percentage of students who were able to get the average less than 5%. Whereas after the intervention (Post-test), this percentage rose to 37% for the control groups and 98% for the experimental groups. To interpret these results, it is necessary to explain the details of the intervention and its positive impact on improving student outcomes.

For Unit 1, students in experimental groups were very involved in handling. They made the microscopic preparations, observed, drawn, compared, and deduced the components of the cell. On the other hand, for the control groups, another teacher did his ordinary work. He made the microscopic preparations and the students simply observed the preparations already made. It seems that the students' active involvement in learning activities has a very positive impact on the acquisition of knowledge and on the appropriation of certain practical skills relating to manipulation.

For unit 2 which is related to chains and food webs, we mainly based our intervention on the exploitation of images of being alive (in the wild) to build food chains. This is with a demonstration on how to write a food chain. During this process, we noticed a very important thing: students make mistakes and cannot easily build food chains from the names of living things. But when these names are replaced by anonymous images of these same living beings, students easily succeed in building a food chain. It can be concluded from this that the amount of information given by the image (visual aids) is greater than that given by the verbal. In the same sense, Felder et al. (2000) stated that most students get much more visual information than verbal information. Thus, Briggs, Stedman and Krasny (2014) suggested that visual methods based on photography lead to deeper understandings.

Concerning unit 3, we used local examples: the deforestation of "Oued Fez" forest and the industrial pollution of "Oued Sebou". By exposing their work, students have discovered by themselves the factors of natural imbalances and their repercussions (extinction of certain species and deterioration of food chains). From the observation of certain significant images related to the factors of ecological imbalances (fires, pollution and overexploitation of the natural resources), students have been invited to draw the eco-responsible behaviors which contribute to the maintenance of the ecological equilibrium from each image. Among the behaviors mentioned are: avoiding pollution of the environment, consuming without wasting natural resources, preserving the forest against fire.

In their study, Saribas et al. (2017) stated that "EE courses should involve presentations, reflections, and discussions on authentic, local, and specific environmental issues" (p. 14). Also, Anderson (2012) pointed out that a more in-depth examination of the local, tangible and concrete aspects of climate change education leads to "individual favourable behaviors that support the march towards climate change mitigation" (cited by Higde et al., 2017, p. 10). Moreover, Tugurian & Carrier (2017) specify that the child has an environmental identity. This identity can be exploited (according to the author) to improve his environmental behavior and strengthen his interest in the natural sciences. Some authors (Akçali & Demircioğlu, 2017; Greenberg, 2000) have also emphasized the importance of using the local historic environment in teaching.

For Unit 4, local examples were also used. The students interviewed their families about the species of fish that disappeared from the "Sebou River" and the causes of its extinction. The subject aroused their interest and motivation. However, they discovered the species of fish that disappeared; the shad (Alosa alosa), as well as the type of pollution that caused its extinction (industrial pollution). To discover the second risk threatening water resources (overexploitation), another local example was used; the drying up of Lake "Dayet aoua". Students' responses were supported by pictures. From the analysis of these two examples, students easily arrived at deducing the eco-responsible behavior that must be adopted. These behaviors are the preservation of water against pollution and waste. So, it can be said that the exploitation of local environmental problems in the sciences courses with active methods has resulted in a significant improvement in the acquisition of environmental knowledge.

Environmental Behavior and Motivation Before and After the Intervention

Here, we measured the impact of our intervention on the student's motivation and readiness to use the acquired knowledge and the improvement of his pro-environmental behaviour. The results are shown in the table below:

Table 11. *The use of environmental knowledge (occasionally or often) before and after the intervention*

	The use of declared knowledge before the intervention		Intentions of knowledge use after the intevention	
Eco-responsible behavior	*n/N*	%	*n/N*	%
The economy in the use of water	34/61	55.73%	51/61	83.60%
Preservation of the near environment against pollution	40/61	65.57%	54/61	88.52%
Preservation of the forest against fires	44/61	72%	57/61	93.44%

From the units that were the object of the intervention, we shed light on three main eco-responsible behaviours: the economy in the use of water, the preservation of the close environment against pollution, and the preservation of the forest against fires.

Table 11 shows that our intervention has contributed significantly to improve student motivation and their intention to adopt eco-responsible behaviours in the future. We can deduce that the student's active involvement and engagement in the study of local and tangible environmental problems significantly improves their predisposition and their motivation to adopt pro-environmental behaviours. The very positive impact of addressing local and tangible environmental issues in improving the student's pro-environmental behavior was also emphasized by Saribas et al. (2017); Anderson (2012); Higde et al. (2017); Chanse et al. (2017); Tugurian and Carrier (2017); Jefferson, Ciro, and María Andrea (2017). Although there is a difference between the motivation to adopt a pro-environmental behavior and the actual achievement of this behavior, many authors consider motivation as an internal factor and essential condition for effective learning and also as a precursor of a pro-environmental behaviour (Kollmus & Agyeman, 2002; Ajzen & Fishbein, 1980; Linnenbrink, 2006; Moisander, 1998; Fröhlich et al., 2013).

Conclusion

This study examined, among other things, the effect of an intervention (sciences course) on the acquisition of environmental knowledge and on the predisposition of the student and his motivation to adopt pro-environmental behaviors. The results of the intervention showed that the active involvement of the student in the study of local and tangible environmental problems contributes to significantly improve his acquisition of environmental knowledge related to the sciences syllabus and also his motivation to adopt eco-responsible behavior.

The comparison of the results of the four institutions studied showed that eclecticism is of a great importance. Also, there is a significant positive correlation between the application of active learning methods, the variety of teaching aids, and the degree of mastery of environmental knowledge. It can be said that the use of active learning methods and the diversity of teaching aids used in a science course are indicators of effective learning. This translates into increased student performance. On the other hand, the excessive use of dogmatic methods (student passivity) accompanied by a single teaching aid (the textbook) constitute indicators of less effective learning, especially when it adds to the effect of the high number of students per class (about 40 in our case). Active learning methods emphasize the active involvement of students in their learning. Thus, they are widely recommended, whether in general education or especially in environmental education.

Our intervention has also showed that “a picture is worth a thousand words”. Hence, the use of images of living beings (as a teaching aid) is highly recommended to facilitate unity learning about food chains. Additionally, the use of images is recommended both to inculcate in mind the factors of natural imbalances and to deduce eco-responsible behaviour.

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Abstract

This study aimed to investigate the effect of conceptual change texts on the conceptual understanding of local government concepts pertinent to the "power, management and society" learning field, as well as the "People and Administration" unit on the fourth-grade social studies course. In the study, a semi-experimental design with pre-/post-test control groups was adopted and samples were obtained from easily accessible samples from non-probability sampling types. The sample consisted of 34 students. As a means of collecting data, a two-stage conceptual understanding test was employed for the level of conceptual understanding, as developed by the researcher. In the analysis of data, dependent group/independent groups' t-test and covariance analysis were employed. It was found that the achievement scores of the last test made after the experimental process, based on the conceptual change texts, yielded a significant difference in favour of the experimental group. As a result of the research, in comparison with the activities carried out according to the current curriculum, it is possible to say that the conceptual change texts make a positive contribution to the level of the conceptual understanding of the students.

Keywords: Conceptual Change, Misconception, Social Studies

Introduction

As a requirement of constructivist education understanding, it is of utmost importance that the individuals constructing knowledge can make information permanent and transfer it to daily life through various abstractions, understandings, analyses and constructs that make up knowledge. Concept teaching is becoming more and more attractive in lessons, especially in forms of social studies that are multidimensional and have a content integrity that can be directly related to interdisciplinary and daily life, while being placed on concept-value-skill grounds. It is accepted that an important precondition about learning and constructing basic concepts pertain to the fields that are alluded to in the understanding and assessment of many economic, social, cultural, global and historical processes, which constitute the core of social studies courses. The social sciences curriculum seeks to find ways of attributing "acceptable" significance to the social order and the world that individuals move through (MoNE, 2005). In this respect, as a requirement of the content of social studies courses, students who encounter different concepts related to many fields might face erroneous perceptions of basic concepts or construct imperfections; as a requirement of the spiral curriculum, many misconceptions or mislearning in future periods occur.

The qualitative execution of the conceptual teaching process requires a systematic analysis of the nature and the multiple viewpoints of the "concept". In this context, there are many different definitions, stages and classifications related to concepts. Öner (1986) classified concepts in terms of how they are handled in terms of the individual universal, singular and abstract/collective, and abstract/collective/positive and negative, as well as essential (relative) and correlative (faulty) in relation to each other. Concepts can be defined as the basic building blocks of the thought life of individuals during their lifetime (Dündar, 2011). Concepts are the abstraction of one or more characteristics of a particular stimulus (Morgan, 1977). In the most general sense, "concepts" are mental structures that represent the processes of organizing similar objects, events, situations, thoughts and actions (Klausmeier, 1992). However, the most basic dimension that is particularly expressed in concept teaching is the "abstraction skill" period. Abstraction skills have an important role to play in high-level thinking, generalizability, inter-conceptual relations, hypothesis testing and organizing knowledge. In addition, stages in the concept teaching model are classified as presentation of examples, formation and analysis of hypotheses, closure, application (Kilbane & Milman, 2013).

In educational processes, in addition to concept teaching, conceptual understanding and the elimination of conceptual misconceptions are also of great importance. Especially, when determining and eliminating alternative concepts and contradictory concepts that are contradictory to scientific reality, conceptual change in the desired direction is dependent on a number of factors. When the literature is examined, it can be seen that there are various nomenclatures for the conceptual change process . In the process of conceptual change, there is a gradual change in mental models of the individual's physical world, either in terms of revision or by various enrichments. Enrichment involves adding information to existing conceptual constructs. Revision may require changes to individual beliefs or assumptions, or changes in the relational structure of a theory (Vosniadou, 1994). The conceptual change process is the elimination of existing conceptual misconceptions and the observation and modification of misconceptions in order for significant learning to take place (Smith, Disessa & Rochelle, 1993). Conceptual change in a general sense is a term that shows the way of learning from students' pre-learning thoughts to new scientific concepts to be learned (Duit & Treagust, 2003). Conceptual change is most useful when they provide students with the opportunity to critically assess scientific evidence in comparison with their previous knowledge (Broughton, Sinatra & Nussbaum, 2013). Although there are different conceptions about the conceptual change process, the general expectation is that the original conceptions of the students take place among scientific conceptions (Mortimer, 1995). The conceptual change is the creation of learning by powerful-

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ly restructuring young or adult individuals' thoughts about something. For example, it can be argued that conceptual change appeared when small children began to understand the earth globally, setting aside the idea that the earth is flat (Dole, 2000). On the other hand, the recent debates and criticisms of the conceptual change process relates to the "what" of the conceptual change. As Mortimer (1995) has pointed out, "conceptual change" as a constructivist understanding has been "transformed into a label that encompasses many different and sometimes inconsistent views" (p. 267). It is also criticized by Vosniadou (2007) for its over-emphasis in terms of mental contradiction.

In the conceptual change model, learning does not simply involve the insertion of new pieces of information into existence, but the interaction of existing information with new knowledge; in other words, it is possible to reconcile existing knowledge with new knowledge wherever possible (Hewson & Hewson, 1983). In this understanding, there are three important steps for new knowledge to integrate itself with existing knowledge and satisfy the student:

The first is that the new concept is understandable; in other words, it is the person who knows what the new concept is and creates a consistent representation of the concept.

Secondly, it is considered as an absolute conviction that the new concept is reasonable and can be rectified. The last is that the concept serves to solve problems and presents new approaches (Hewson & Hewson, 1983). However, as pointed out by Posner, Strike, Hewson and Gertzog (1982), there are four important stages for the conceptual change process to take effect:

- Dissatisfaction: The concept that is present in the mind of the student is incomplete/inadequate.
- Intelligibility: The new concept for the student is "understandable".
- Plausibility: The new concept for the student is logical and consistent with other concepts.
- Fruitfulness: The use of the new concept in any situation or problem that the student has encountered.

In order for the conceptual change process to take place, it is necessary to identify the misconceptions/alternative concepts in the information by revealing the prior knowledge of the student and to make the student feel the inadequacy of these misconceptions.

The mental conflicts/cognitive contradictions, which will be experienced when students face the concepts scientifically verified by the conceptual change texts (CCTs), are considered an important tool in the process of overseeing and regulating the new concept to be acquired.

Research on texts based on the conceptual change approach has mostly been used in science education in the domestic and international literature. Özdemir (2012) investigated the effectiveness of CCTs in relation to achievement, attitude and motivation in fifth-grade science and technology lessons according to different learning styles, resulting in an increase in the conceptual achievement levels of students. In the research conducted by Çaycı (2007), the influence of CCTs on the significance and science of classroom teacher candidates was examined and the positive impact of the conceptual change approach on the achievement of the achievement was observed, but it was determined that the effect on attitudes was not affected. In Altuntaş-Aydın's (2011) study, the effect of model and CCTs on student achievement and conceptual change effects were investigated; it was been found that the method used positively contributes to improving conceptual misconceptions and increasing achievement.

The effect of CCTs, enriched by key conceptual activities, on the conceptual understanding levels, attitudes and permanence of science and technology teacher candidates was investigated by Demir (2010), who determined a positive influence on conceptual understanding and sustenance. In the study conducted by Akpınar (2012), it was determined that CCTs had a positive effect on student access in a context-based approach based on the 5E model. In the study on the conceptual achievement and the effects of CCTs during eighth-grade science and technology lessons by Sarı Ay (2011), the positive effect of achievement and conceptual misconceptions was revealed in the study. In the study conducted by Akgül (2010) among science and technology teacher candidates, the level of the conceptual understanding of CCTs, enriched by upper conceptual activities, as well as the persistence and the positive effect of sustenance, was put forward. A meta-analytical study was conducted by Öner Armağan (2011) on the effectiveness of CCTs, which concluded that CCTs are more effective than traditional teaching methods.

Studies in which the CCTs are used in the teaching of social studies are quite limited. In the study conducted by Türksever (2013), the positive effects of CCTs in determining and rectifying the misconceptions of CCTs in geography teaching were put forward. Akbaş, Koca and Cin (2012) reached the conclusion that CCTs had a positive effect on the conceptual misconceptions in ninth-grade geography teaching. Aladağ and Yılmaz (2014) examined the effectiveness of CCTs in fourth-grade social studies classes and found that these texts had a positive effect on the elimination of misunderstandings about concepts.

In the research conducted by Kılıçoğlu (2011), the effect of CCTs, when applied to certain concepts in the sixth-grade social studies curriculum was investigated. The researcher reached the conclusion that CCTs made a positive effect on the level of achievement and the elimination of misconceptions about the concept. However, it is seen that, in the course of social studies, the misconceptions about the concept can be determined by methods such as concept maps, concept cartoons and concept nets, which are gradually becoming stereotyped and standardized. Moreover, although there is a limited number of conceptual change-based studies in the field of social studies, it is possible to observe that CCTs are developed more towards science concepts. The social sciences course provides a rich and solid background in terms of the scope of the political concepts in which cognitive contradictions take place, as well as the awareness of them, self-regulation and restructuring of concepts. It is believed that the application of CCTs in the social studies field and political concepts could contribute to the literature. In this context, the study provides an important example of the effectiveness of the conceptual change texts in identifying and eliminating misconceptions in social studies lesson. In addition, this study provides an example of how teachers use conceptual change texts in primary school.

The purpose of this research is to determine the effect of CCTs on the conceptual understanding level of students in the learning strand of the "power, management and society" and "people and administration" (local and central administration) units on the fourth-grade social studies course. In response to this objective, answers to the following questions were sought:

- What are the current conceptual misconceptions among students in the experimental and control groups regarding the concepts of local administration and central administration?

• Is there a significant difference between the conceptual understanding level of pre-test and post-test achievement scores of the students in the experimental group whose learning is based on the CCTs in the social studies class?

• Is there a significant difference between the level of the conceptual comprehension of pre-test and post-test achievement scores of the control group students, based on the current curriculum in the social studies class?

• Is there a significant difference between the post-test scores of the experimental and control groups when pre-test scores are recognized as constant?

Materials and Methods

In the study, a pre-test/post-test control group semi-experimental design was adopted from experimental models. As stated by Karasar (2009), "experimental models are research models in which the aim is to determine cause-and-effect relationships and produce the data to be observed under the direct researcher's control".

The research process involved the "People and Administration" unit, while the activities based on the current curriculum were carried out among the control group. Activities related to the CCTs prepared by the researcher for the experimental group were applied during the four-hour-long course. In this context, the following table sets out the experimental pattern applied in the research process:

Table 1. *Pattern for the experimental model used in the research*

Groups	Pre-test	Experimental Process	Processing Time	Post-test
Experiment	Two-stage Achievement Test (1)	CCTs	4 lesson hours 40+40+40+40 minutes	Two-stage Achievement Test (2)
Control	Two-stage Achievement Test (1)	Current Programme-based Activities	4 lesson hours 40+40+40+40 minutes	Two-stage Achievement Test (2)

The experimental and control groups were pre-tested as a two-step achievement test, which was prepared by the researcher during one lesson hour; then, activities based on CCTs were carried out by the researcher. In the process of preparing the CCTs related to the experimental process, literature on the subject of "people and management" was researched and a projection about conceptual misconceptions and levels of understanding was attempted and a limited number of studies was identified (Doğan, 2007; Topçubaşı & Polat, 2014). Next, a fourth-grade social studies textbook prepared by different publishers and the 2017 fourth-grade social studies curriculum were examined. In addition, the students were asked to complete the two-step test, and a list of the preliminary information that led to the conceptual misconceptions was made. This was an important prerequisite for the identification of the cognitive contradictions that students have in a conceptual change process and for the awareness of conceptual misconceptions.

While CCTs were created, the factors of inadequacy, comprehensibility, reasonableness and efficiency, which were determined by Posner et al. (1982), were considered. At the dissatisfaction stage, students' sentences containing misconceptions were inserted as text into cartoons, while, using current Internet news and diagrams, questions were asked about why the misconceptions were caused. By illustrating the concepts, attention was drawn to the cognitive contradictions and mental conflicts of the students. Then, in the section called "Stop and Think", the students were presented with various examples of the missing reality from the misconceptions, with the specific expressions to be highlighted written in colour, bold, italic and large font sizes. In turn, the stage of intelligibility was completed using cartoons and visuals. In the third stage, the "Text Reading" sections were established in order to be able to work on the alluded concepts behind the case studies, which students may have encountered in daily life and to adapt them to existing schemes. Thus, the plausibility phase was completed. Subsequently, the necessity of local and central administrations and the sub-dimensions related to these concepts were reflected in relation to daily life and the existing management system.

In the "Order!" section, once the concept was internalized and evaluated using various questions, the fruitfulness phase was completed. After the aforementioned preparation period, five students were invited to pre-read, and the long sentences were shortened, and the text was simplified. Then, by applying a Turkish perspective, two primary school teachers and a teacher in social studies extracted unnecessary repetitions and visual elements, which disturbed the flow.

While the experimental group was performing the experimental process with the CCTs, the control group was instructed to undertake the activities based on the existing curriculum. The same dependent variable (conceptual comprehension) was observed in both groups.

Both groups then performed a two-stage achievement test as a final test during a one-hour session. Pre-test and post-test scores were compared both between groups and in the groups.

Study group

The sample (study group) selected for the study constituted a total of 34 students from the fourth grade in a primary school in Ankara during the academic year 2016-2017. In the study, a pre-test/post-test control group semi-experimental design was adopted from experimental models. In the semi-experimental design; control and experimental groups cannot be selected randomly. However, the groups must have similar properties. Therefore, two classes with achievement levels close to each other were preferred (Table 3). One of these classes was randomly determined as (4-A) and the other as control group (4-B). In this context, the frequencies and percentages of the gender of the students in the sample are as indicated in Table 2:

Table 2. *Frequency and percentage ratios of the gender of students in the sample group*

	4/A Grade		*4/B Grade*	
	Frequency (*f*)	Percentage (%)	Frequency (*f*)	Percentage (%)
Girl	8	47.05	9	52.95
Boy	9	52.95	8	47.05
Total	17	100	17	100

Pre-test conceptual comprehension scores were compared in the groups' equivalence study and the obtained results are shown in Table 3.

When Table 3 is examined, it can be seen that there is no statistically significant difference between the average scores of the experiment and control groups obtained from the preliminary test ($t_{(32)}$= 0.479; p> .05). This finding can be interpreted as confirmation that the preliminary knowledge among the students concerning the conceived concept was close in relation to each other.

Table 3. *T-test Results on the results obtained from the preliminary test by the experimental and control group*

Group	*N*	*M*	*sd*	*Df*	*t*	*p*
Experiment Group	17	9.88	1.409	32	.479	.635*
Control group	17	9.64	1.450			

**p<0.05*

Data Collection Tools

A two-stage achievement test was developed by the researcher to be used in the pre-test and post-test periods, taking into consideration the purpose of the study. The first part of the two-step test consists of four alternative questions, and the second part consists of open-ended questions where students are asked to explain the answers given in the first part. The first part of the two-step test consists of four alternative questions, and the second part consists of open-ended questions where students are asked to explain the answers given in the first part. The most distinctive feature that distinguishes two-step tests from multiple-choice tests is the second step in the second part of the test, in which a response in the first part is requested (Chen, Lin & Lin, 2002; Karataş, Köse, & Çoştu, 2003). In this sense, a 27-item question pool was established to determine conceptual misconceptions in the "People and Management" unit and the level of understanding.

For each question, three of the options include misconceptions about the "People and Administration" unit, while the remaining option includes the rectified answer.

In the writing phase for the questions, social studies textbooks and workbooks published by different publishing houses in different years were examined, and studies on local government and central administration concepts were analysed in the summer. On the curriculum, the achievements related to these concepts were examined and Bloom's taxonomy was used, while a 27-item question pool overlapped with the gains. At the same time, a table of notations as shown in Table 4 was prepared to increase the coverage of the study.

Table 4. *Establishment of the notation table for the achievement test*

Concepts	Recognition	Comprehension	Application	Analysis	Synthesis	Evaluation	Total
Municipality	8,17	6,11,26	1.409	15,21	.479	.635*	7 questions
Mukhtar		3, 5, 10, 18	1.450	13			5 questions
Local Administ.	20,1,2,9,12, 14,16,20	14,24		19,27			12 questions
Election	4,7,25						3 questions
Total							27 questions

It was also noted that similar questions should not be repeated in order to avoid similar questions directing the students. The prepared questionnaires were examined by an area specialist and a social studies teacher and agreed upon, with the necessary arrangements made. Within the scope of the fourth-grade social studies course, the preliminary application of the conceptual achievement test for 12 students was carried out. The students were informed about the properties related to the pre-implementation test (purpose of the test, number of questions, response style etc.). After the pilot implementation by the researcher, sentence and question roots, which were difficult to understand, were rearranged and long sentences were abbreviated. However, Items 6, 13 and 23 had a low discriminatory index, Item 7 was easy according to the difficulty index, and Items 6, 14 and 27 werefound to be hard and removed from the test.

The KR-20 reliability coefficient of the conceptual achievement test, which was pre-applied by using the SPSS program in terms of reliability, was found to be 71. After all these processes, the test was transformed into a two-stage test consisting of 20 items. Sample of item is as follows:

"Which of the following is not among the local government units?

a) Special Provincial Administration
b) School Administration
c) Municipalities
d) Mukhtars

Because...

Analysis of Data

In the analysis of data, the first problem was analysed and the percentage (%) and frequency (*f*) values were determined to evaluate misconceptions and their frequency of occurrence. In the data analysis process related to other sub-problems, it was examined whether the data showeda normal distribution or not. Regarding the scores from the experimental and control groups, skewness and kurtosis coefficients and Kolmogorov-Smirnov and Shapiro-Wilk tests were used.

Table 5. *Data relating to skewness and kurtosis coefficients*

	Skewness	Kurtosis
Experimental Group	-.374	-.367
Control Group	.014	-.747

When the skewness and kurtosis coefficients in Table 5 are examined, it can be seen that the scores do not deviate from the normal distribution. It may be pointed out that scores have normal distribution if the values for skewness and ridge indicate a value between -1.5 and +1.5 (Tabachnick & Fidell, 2007).

Table 6. *Data relating to the Kolmogorov-Smirnov and Shapiro-Wilk tests*

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Experimental	.180	17	144	945	17	.384
Control	.142	17	200	951	17	.467

It can be seen that the pre-test scores for the experimental and control groups show normal distribution according to Table 6 ($p > .05$). For this reason, parametric tests were used in the data analysis process.

However, in the analysis of the data obtained from the two-stage achievement test, dependent group and independent group *t*-tests were used. The independent group *t*-test was used for the second sub-problem, while the dependent group t-test was used in the analysis of the third and fourth sub-problems in order to test the effect of the experimental process in the studies in which the pre-test/post-test control group semi-experimental design was adopted. In the analysis of the fifth sub-problem, covariance analysis was used to determine whether the difference between the post-test scores was significant, as the pre-test scores for the groups remained constant.

Results and Discussion

The data were analysed by considering the purpose and sub-problems of the study; the findings of each sub-problem are given below.

Current Conceptual Misconceptions of Students in Experimental and Control Groups Related to Local and Central Government Concepts

The misconceptions that students have concerning the "People and Administration" unit on the fourth-grade social studies course were determined by the analysis of the justification sections, starting with "because...", in the open-ended section of the two-stage test. In this respect, the misconceptions of the students were expressed as shown in Figure 1.

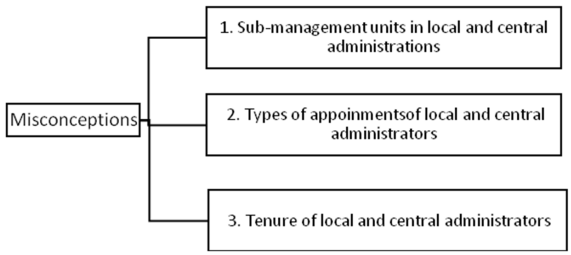

Figure 1. Misconceptions about the Concepts that Students Have About the "People and Administration" Unit

Items 1, 6, 12, 14, 16 and 19 in the two-stage conceptual understanding test related to the first conceptual misconception, Items 4, 7, 9 and 18 related to the second conceptual misconception and Items 13 and 20 related to the third conceptual misconception.

Table 7. *Prevalence of misconceptions among the experiment and control group students*

	1st Conceptual Misconception		2nd Conceptual Misconception		3rd Conceptual Misconception		Total	
	f	%	*f*	%	*f*	%	*f*	%
Experiment Group	21	44.68	14	29.78	12	25.53	47	100
Control Group	18	43.90	17	41.46	6	14.63	41	100

It has been observed that the students had various misconceptions concerning the classifications of the sub-governing units in local and central administrations. Some students defined governorships and district governments as local governments, while other students defined municipalities and mukhtars as central administrations. In addition, some institutions, such as associations, foundations or hospitals, have been classified as local/central government units by certain students.

Examples of misconceptions among students in the experimental and control groups in terms of "sub-governing bodies" in local and central administrations are as follows:

> *K_3: "Because the governor is the greatest local ruler in the county, he will rule us."*
>
> *K_{11}: "Because schools are governed."*
>
> *D_8: "Because district governors work in local government, they build the roads."*
>
> *D_{12}: "Because the mukhtars are people working in the centre, they go to villages from the centre."*
>
> *D_{16}: "Because the mukhtars go everywhere from the centre, they help people there."*

The conceptual category of "appointing local and central administrators" is the most intensive misconception category. In particular, it has been observed that some students have misconceptions about the concepts of "election and appointment" (governor/district governor) and the administrators elected by the public (mukhtar/mayor). Examples of conceptual misconceptions among administrators involved in local and central administrations regarding the election and appointment are as follows:

> *K_8: "Because the mukhtars inform the municipality about sanitation jobs in the neighbourhood. Because the municipality chooses the mukhtar."*
>
> *K_{12}: "Because the president appoints the mayor in the most appropriate manner."*
>
> *K_{15}: "For me, the governor chooses the mukhtar and the mayor, because he is the greatest."*
>
> *D_1: "For me, our mayor chooses the mukhtar."*
>
> *D_9: "Because the mayor is not elected, he is appointed by the government."*

The misconceptions that students in the local and central administrations have about the term of office are related to how long the elections are held, how long the local administrators can be in service, and the term of office of the administrators in the central administration. Examples of misconceptions that students have about the tenure of local and central administrators are as follows:

> *K_3: "Because, according to me, the mukhtars serve for three years, then they change."*
>
> *K_4: "Because the mayor can serve an unlimited term of office after being elected by the Prime Minister."*
>
> *K_{14}: "Because no one chooses the mukhtar, he will serve two years freely if he wants to."*
>
> *D_5:" Because, for me, governors and district governors may change after three years."*
>
> *D_{10}: "Because the district governor is elected every five years, like the mukhtar."*

Comparison of Pre-test and Post-test Scores of the Students in the Experimental Group

The dependent group t-test was used to determine whether there was a significant difference between the averages of the pre-test and post-test scores of the experimental group for the "People and Administration" unit; the findings are given in Table 8.

Table 8. *T-test results on the findings obtained from the pre-test and post-test by the experimental group*

Experiment Group	*N*	*M*	*sd*	*df*	*t*	*p*
Pre-test	17	9.88	1.409	16	37.18	.000*
Post-test	17	16.29	1.455			

**p<0.05*

When Table 8 is examined, there is a statistically significant difference in favour of the post-test ($t_{(16)}$= 37.18; p< .05) when the pre-test and the post-test scores of students in the experimental group are compared. In addition, the arithmetic mean (*M*= 16.29) of the scores obtained from the final test involving the experimental group regarding the concepts in the "People and Management" unit was higher than the arithmetic mean of the scores obtained from the pre-test (*M*= 9.88). This situation can be interpreted as a positive effect on the level of conceptual understanding of teaching based on the CCTs.

Comparison of Pre-test and Post-test Scores of the Students in the Control Group

The dependent group t-test was used to determine whether there was a significant difference between the mean of the pre-test and post-test scores of the control group in the "People and Administration" unit, with the findings given in Table 9.

Table 9. *The T-test results of the control group obtained from the pre-test and the post-test*

Control Group	*N*	*M*	*sd*	*df*	*t*	*p*
Pre-test	17	9.64	1.409	16	37.18	.000*
Post-test	17	11.35	1.455			

**p< .05*

When Table 9 is examined, statistically significant differences were found in favour of the post-test when the pre-test and post-test scores of the control group students were compared ($t_{(16)}$= 37.18; p< .05). In addition, the arithmetic mean (M= 11.35) of the post-test scores obtained from the control group on the concepts in the "People and Management" unit was higher than the arithmetic mean of the pre-test scores (M= 9.64). This can be interpreted as a positive effect on the level of the conceptual understanding of teaching based on the current curriculum.

Comparison of the Post-test Scores of the Experimental and Control Groups When Pre-test Scores are Considered to be Constant

Covariance analysis was conducted to determine whether there was a significant difference between the post-test scores when the pre-test scores of the control and experiment groups for the "People and Administration" unit were kept constant. Primarily, the assumptions required for performing covariance analysis (normal distribution of data, homogeneity of group variances, and uniformity of regression coefficients) were tested, after which covariance analysis was undertaken. The results of the analysis are given in Table 10.

Table 10. *Descriptive statistics for the mean of covariance analysis outcome for groups*

Group	*N*	*M*	Adjusted Average
Experiment Group	17	16.29	16.28
Control Group	17	11.35	11.36

When Table 10 is examined, with the average of 16.29 in the experimental group taken as the rectified average, the mean is 16.28; the control group's average of 11.35 has a rectified average of 11.36. It is seen that the adjusted average scores for the groups are higher in the experimental group. The covariance analysis results for determining whether the difference between the adjusted mean scores of the groups are truly significant are given in Table 11.

Table 11. *Results of covariance analysis for post-test scores adjusted for pre-test scores*

Source of Variance	Total of Squares	*sd*	Mean of Squares	*F*	*p*
Pre-test	.209	1	.209	.073	.789
Group	204.946	1	204.946	71.224	.000*
Error	89.203	31	2.878		
Total	6.794.000	34			

**p< 0.05*

As seen in Table 11, it can be seen that there is a significant difference in the experimental group between the final test average scores ($F_{(1-31)}$= 71,224; p< .05) for the experimental and control group students, when rectified for pre-tests. In addition, according to the results of the Bonferroni test performed on the adjusted average in the experimental and control groups, it can be seen that the adjusted average (M= 16.28) for the test group is higher than the rectified average score (M= 11.36) of the control group. Therefore, it can be said that the test scores of the experimental group students are higher than for the control group students.

Conclusion

When the social studies curriculum renewed in 2017 is examined, it can be seen that the conceptual teaching process holds an important place. In the "Competences" section of the curriculum, the importance of concept teaching in many fields, such as interaction in relation to mother tongue and foreign languages, competences in social citizenship is mentioned. Within this concept, it is recommended that different concept teaching classifications and approaches should be used, while misconceptions should be eliminated (MoNE, 2018). In this context, one of the effective methods used in the concept teaching process is the conceptual change texts. With its different system, CCTs, among the alternative methods, provide students with an interactive environment. Since they are based on students' prior knowledge and experience, the misconception behind CCTs, students' sense of concept, the comparison between concepts based on scientific reality and the misconceptions of existing concepts, when efficiently transferred to everyday processes by assimilating the concept based on scientific reality, the form of understanding is constructed on the basis of constructivist learning theory.

In this respect, in this study, when using CCTs on a fourth-grade social studies course, students enrolled on the "People and Administration" unit have many misconceptions about this unit. Especially in the context of local and central administration, students have a number of misconceptions regarding the duration of appointments, elections, sub-governing bodies and managers' duties. The research is consistent with the findings of the study conducted by Memişoğlu and Tarhan (2016) in terms of the misconceptions that social studies teachers intensively face in educational processes (management forms; centralized management concepts). However, the findings of the research are in parallel with the concept misconceptions (local government/municipality/election concepts) as realized by Bal and Akış (2010) and encountered in the "People and Administration" unit on the social studies course. Regarding the inadequacies of students in the pre-test process, the basic concepts of the "People and Management" unit are concerned with preliminary information not based on scientific grounds and alternative concepts, which these students have acquired from their daily lives and experiences. Pre-concepts that students may possess have a positive or negative effect on learning processes (Pintrich, Marx, & Boyle, 1993). It is especially important to identify the prior knowledge and concomitant misconceptions. It is a long process to eliminate misconceptions that are resistant to change, even for students with high academic scores (Guzzetti, 2000). Misconceptions emerging from courses including numerous political concepts, such as social studies, gradually splice and then multiply. Similarly, in this research, the conceptual category of "appointing local and central administrators" is the most intensive political misconception category. In order to overcome misconceptions, new knowledge must be understandable and sensible for students (Hewson & Hewson, 1983).

For this study, the effect of CCTs on the level of the conceptual understanding of students was examined; the conceptual misconceptions of CCTs and the positive effect on their achievement have been put forward. As a result of the research, it can be seen that the students in the experimental group had higher levels of understanding of the basic

concepts of the "People and Administration" unit than the students in the control group, while more explanations based on scientific reality about the concepts were used. When the literature is examined, this research coincides with the end result of many studies showing that CCTs make positive contributions to increase levels of understanding and eliminate the misconceptions (Hewson & Hewson, 1983; Wang & Andre, 1991, Chambers & Andres, 1997; Çaycı, 2007; Kılıçoğlu, 2011; Sarı-Ay, 2011; Akpınar, 2012; Özdemir, 2012).

The studies based on the CCTs in the field of social sciences have been dealt with in terms of an interdisciplinary approach, such as "climate, map, scale, weather and location", where social science and physical science intersect. The lack of literature on the use of CCTs concerning concepts addressed on political and ideological grounds, such as municipalities, reeves, local government and elections, does not enable the findings of the research to be extensively assessed in the light of other studies. However, in more recent social studies, concepts such as value, culture, national culture, tradition (Aladağ & Yılmaz,2014), proof, chronology, century, tradition (Akşit, 2016) age, aesthetic, conquest, holy war, reform and settlement (Şarlayan, 2017) are used in conceptual change studies. When considering the stages of creating awareness among students about the reasons for conceptual errors, making students feel the current conceptual deficiencies, understanding and accepting the explanations based on scientific reality, comparing conceptual significance with different students, and discussing and using the concept efficiently and correctly, it can be said that CCTs can be effectively adapted in relation to the teaching process in terms of the many concepts in the social studies curriculum. However, in the use of CCTs, which should not be forgotten in this process, especially in the change in political and ideological concepts, there is the possibility of encountering strong and intense resistance and the necessity of a long educational process.

Within the scope of the study, it has been deemed appropriate to submit the following suggestions for practitioners and researchers.

•On the social studies course, research can be carried out on the different political concepts (constitution, authority, political party, pluralism, etc.), especially in the upper classes, in order to avoid conceptual misconceptions of CCTs and the influence on conceptual significance.

• Research can be conducted in terms of how CCTs at different grade levels affect attitudes towards social studies lessons and the persistence of achievement.

• CCTs: research on the effects of classification, abstraction, comparison and interpretation processes, which are the basic steps of concept teaching, can be carried out.

• Researches can be conducted based on comparing the effect of CCTs in understanding the concepts and rectifying misconceptions with methodological concept maps, concept nets, analogies, significance analysis tables and so on.

• Using the misconceptions encountered frequently on social studies courses and workbooks, the addition of CCTs and the active use of teachers in educational processes can be achieved

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Notes

[1] This is referred to as assimilation and accommodation by Posner at al. (1982), enrichment and revision by Vosniadou (1994), and weak and strong knowledge restructuring by Duit and Treagust (2003).

[2]Those concepts that remain outside the scientific reality can be referred to as misconceptions (Nakhleh & Krajcik, 1994; Helm,1980), preconceptions (Anderson & Smith,1987), alternative conceptions (Gonzalez,1997), naive conceptions (Fensham,1988), alternative frameworks (Driver & Easley,1978), common-sense conceptions (Halloun & Hestenes, 1985) and spontaneous knowledge (Treagust,1988). In this research, "alternative concepts", having a more general and widespread use, are preferred.

[3]Conceptual change texts are abbreviated as CCT throughout the study.

[4]Fourth-grade Social Science Workbook (2014-2015, Evrensel Yayıncılık); Fourth-grade Social Science Workbook (2014-2015, MEB Yayınları); Fourth-grade Social Science Workbook (2015-2016, DikeyYayıncılık); Fourth-grade Social Science Workbook (2016-2017, KozaYayınları).

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Puppet as a Pedagogical Tool: A Literature Review

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Abstract

This study examines the potential of puppets in the educational context. The study offers a literature review on the benefits and possibilities of the puppet as a pedagogical tool. The literature was searched using primarily an international e-material search of UEF FINNA. Additional articles were retrieved from Google Scholar and from the reference lists of selected papers. Articles were chosen and included according to specific selection criteria. Fifteen papers met the criteria and are included in the review. The review reveals five potential uses for puppets in education. These potential uses include: (1) generating communication, (2) supporting a positive classroom climate, (3) enhancing creativity, (4) fostering co-operation in and integration into a group, and (5) changing attitudes.

Keywords: Pedagogical Puppetry, Educational Methods, Elementary-Secondary Education, Literature Review

Introduction

Puppets are useful pedagogical tools, however, the potential of puppets could be more often utilized in schools. For example, Korosec (2013) reports how a number of educators in Slovenian schools have a predominantly positive attitude towards the use of puppets in classroom situations, but puppets are rarely used in the classroom. One explanation could be that teachers do not have enough knowledge of working with puppets and how these tools would be good and useful. There is relatively little comprehensive research available in English to show the significant benefits of using puppets or puppetry in education. The evidence is mainly provided through case studies, uncontrolled evaluation studies, or short educational interventions.

The purpose of this review is to systematically investigate existing evidence of the reported benefits and possibilities of using puppets in education. This review focuses on scholarly studies in the context of formal education. A synthesis is made of the findings by developing a theoretical framework within which to discuss the benefits and possibilities of puppets as pedagogical tools.

Defining a puppet

A puppet is a movable doll that a puppeteer manipulates. The body movements provide visual impressions: a puppet conveys emotions and thoughts through movement, for example, of its hands and head. A puppeteer can also give the puppet a voice. A puppet is an inanimate object that, in the hands of a puppeteer, comes to life.

Hand puppets have an open interior enabling the manipulation of them directly with one hand. Some puppets have control devices. For example, rod puppets can be manipulated with sticks, and marionettes have strings. Puppetry is a form of theatre or performance that involves the manipulation of puppets. A puppet is, in this context, an umbrella term, and in the reviewed studies, the authors do not necessarily give details about the puppets used. The focus of this article is on hand puppets and puppets manipulated with sticks or strings. Finger puppets, which are smaller than other puppets, are not included.

Educational Contexts of Using Puppets

Pedagogical studies of the use of puppets focus on how a single puppet or several puppets can be used for different purposes and in different educational contexts. The typical educational context for using hand puppets is that an educator plays a puppet theater for children. Puppet theatre as an art form is widely researched (e.g. Peltonen & Tawast, 2009; note also e.g. https://www.unima.org/en/ and http://www.unima.fi). A show can have an educationally important theme, for example, it can present how to handle attitudes towards disabilities (see e.g. Dunst, 2012; 2014). On the other hand, creating a puppet show together, including making the puppets, writing the script, creating the scenery, and performing the play, can be part of artistic education (see e.g. Hamre, 2012; see also special guidebooks published for this purpose, e.g. Arasmo & Alopaeus 1992).

Puppets are also used in education without an actual theatre stage or script. For example, a teacher can use a puppet to ask children questions and discuss the questions with them. A puppet can also be a helpful tool in verifying children's understanding when they answer questions and participate in a dialogue (Remer & Tzuriel, 2015).

In the classroom, puppets are also tools of children and youths. Pupils can create puppets, or a puppet show, or they can play spontaneously with puppets. A puppet can even be a good friend of the children (see e.g. Gobec, 2012; Korošec, 2012).

Puppets are suitable for different kind of educational contexts, from rehearsing performance and expression skills to be integrated into specific subjects (see. e.g. Fisler, 2003; Kroflin, 2012a; Lowe & Matthew, 2000; Simon et al., 2008). Puppets can be used even to teach nanotechnology (see Brits, Potgieter, & Potgieter, 2014). Puppets can also be

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used to deal with children with special needs. Nancy Renfro (1984), looking specifically at special needs children, argues that puppets build self-worth, encourage emotional release, and provide a visual substitute for verbal deficits and a textual substitute for visual impairments. Aronoff (2005, p.120) writes about special puppets made for demonstrating mouth movements, utilized in speech therapy. He also refers to collaboration between speech therapists and puppetry.

In addition to short improvisations or planned shows, it is possible to use puppets for long-term projects. For example, Gobec (2012) has introduced a holistic model for project work with a puppet, which combines diverse purposes. For instance, a project with a puppet could take a whole year, and it could connect diverse fields, such as science, art, culture, technique, media, communication, and ecology.

Methods

This study presents hand puppets as pedagogical tools and introduces the results of a literature review. The review was driven by the following research question: What kinds of benefits and possibilities do puppets have in education?

The literature review was primarily conducted using an international e-material search of UEF FINNA, which is a search service of the University of Eastern Finland. Additional articles were retrieved from Google Scholar and from the reference lists of selected papers.

The following keywords and combinations of keywords were used: puppet* AND education; puppet* AND learning; puppet* AND teaching. The search was limited to abstracts in English. A paper was selected if the abstract was judged to deal with the research question. Explicit criteria for specifying which studies to include in the review were developed (Table 1). All papers were selected independently by two researchers. Disagreements were resolved through discussion.

Table 1. *Inclusion criteria for the review*

Criterion type	Inclusion criteria
Topic	Articles must relate directly to the research question above (benefits and possibilities of puppets in education).
Recency	Articles should have been published between 2000 and 2017.
Age-range	Articles should relate to school-age pupils (5–18).
Context	Articles should relate to formal education: kindergarten or preprimary or primary or secondary education.
Language	Articles should be written in English.
Research base	Articles must be based on empirical research (either qualitative or quantitative).
Transparency	The methodology of the research on which the article is based must be explicit (e.g. sample sizes, instruments, analysis).

To be included in the review, papers had to include empirical evidence relating to the impacts and outcomes of puppets as an educational tool or as a strategy in formal education. For example, puppets have been used in therapy (see e.g. Aronoff, 2005) and in children's healthcare (see e.g. Tilbrook, Dwyer, Reid-Searl, & Parson, 2017), but such articles were excluded from this review because they did not deal with formal education. To be included in the review, papers had to relate to school-age pupils (5-18); further, the terms "children" and "pupils" are used when it is referred to school-age children and youths. Inclusion criteria required that studies were peer-reviewed reports of empirical investigations. Commentaries (see e.g. Belfiore, 2013) and project descriptions (see e.g. Bennett, 2002; Gobec, 2012) were not included. Duplicates and non-English language reports were excluded. Using these criteria, fifteen papers were identified as relevant to the current review. Table 2 provides a summary of papers that met the inclusion criteria.

The reviewers systematically extracted the applicable information from each study after the studies that should be included in the review had been identified. Then the reviewers made a synthesis of the studies. This step involved combining the facts extracted from the studies using qualitative analysis.

Results

Based on our review of the literature, we identified five potential uses applied extensively in educational and learning contexts. The five potential uses are presented here as the comprehensive framework of a pedagogical puppet (see Figure 1), and each potential is given theoretical support from the literature. The potential uses are (1) generating communication, (2) supporting a positive classroom climate, (3) enhancing creativity, (4) fostering co-operation in and integration into a group, and (5) changing attitudes.

Figure 1. *Potential uses for puppets. Pictures are from the website https://punomo.fi/.*

Generating communication

The value of talk and communication in children's learning has been acknowledged since Vygotsky's (1962) work on language and social interaction. In the school context, there is communication between teacher and pupil(s), as well as between children and between teachers. Communication not only represents the transfer of information; it represents the establishment of a relationship with the person to whom we wish to transfer the information.

Eleven studies in the data set (Ahlcrona, 2012; Brėdikytė, 2002; Çağanağa & Kalmış, 2015; Hackling, Smith, & Murcia, 2011; Keogh, Naylor, Maloney, & Simon, 2008; Korošec, 2012; Korošec, 2013; Maharani, 2016; Moriguchi, Sakata, Ishibashi, & Ishikawa, 2015; Remer & Tzuriel, 2015; Simon, Naylor, Keogh, Maloney, & Downing, 2008) highlight a puppet's potential to generate communication. Puppets help (1) increase and improve classroom talk, (2) increase communication by creating a favourable, relaxed atmosphere, and (3) establish teacher-student interaction and children's mutual interaction. We will treat these benefits in detail with help of data from literature below.

Table 2. *Summary of literature review*

Authors and year	Research method	Main outcome	Environment
Ahlcrona 2012	Ethnographic approach: written observations, conversations, photographs, and children's drawings	The puppet is a mediating tool for children's communication and learning.	Preschool education in Sweden
Brėdikytė 2002	Educational experiment: video-taped material, observation	Dialogical drama with pup-pets (DDP method) promotes the child's creative self-expression, encourages the child's independent dramatic play, and stimulates verbal activity and creativity along-side.	Preschool education in Lithuania
Çağanağa and Kalmış 2015	Case study: observation and interviews	Puppets are engaging and motivating in English language learning.	Kindergarten (pre-school learners) in Cyprus
Dunst 2012	Intervention and control group design	Puppetry can improve knowledge and change attitudes toward persons with disabilities.	Elementary school students in USA
Fisler 2003	Analysis of the project	Puppet theatre can provide an enjoyable method of encouraging the development of reading skills.	Elementary school in USA
Hackling, Smith and Murcia 2011	Participatory action research and design-based research collaboration: video record-ings, a questionnaire, field notes, and inter-views	Puppets have a positive impact on student en-gagement and talk in science lessons.	Primary school in Australia
Keogh, Naylor, Maloney and Simon 2008	Case study	Puppets have a positive impact on children's engagement and motivation in science lessons.	Primary school in UK
Korošec 2012	Qualitative interpretative re-search: essays by teachers	The puppet is a medium for communication and personal interaction.	Primary school in Slovenia
Korošec 2013	Descriptive and causal non-ex-perimental method of educa-tional research	Teachers believe puppets improve the communi-cation and socialization in a class-room.	Preschool and primary school in Slovenia
Maharani 2016	Intervention and control group design	Puppetry is an effective media in teaching speak-ing English.	Eighth-grade stu-dents in junior high schools in Indonesia
Mehrotra, Khunyakari, Natarajan and Chun-awala 2007	The design-make-appraise (DMA) approach: observations, field notes, videotapes, and student writings	The design and technology unit on puppetry can engage students in collaborative learning.	Middle school stu-dents in India
Moriguchi, Sa-kata, Ishibashi and Ishikawa 2015	Intervention and control group design	Interaction with a doll or a puppet may have a significant impact on the development of execu-tive function.	3- to 5-year-old chil-dren in pre-school in Japan
Remer and Tzuriel 2015	Intervention: semi-structured interview	A puppet is a mediating tool that increases inter-est and motivation in learning.	Kindergarten in Israel
Simon, Naylor, Keogh, Maloney and Downing 2008	Mixture of research methods: classroom observation, teacher and pupil interviews, and teach-ers' reflective diaries	The use of puppets promotes engagement and talk in science.	Children aged 7-11 in schools in UK
Whiteland 2016	Mixed methods case study	Puppet-making project together with older adults helps children construct new mean-ing in their understanding of aging and older adults.	Elementary class-room in USA

Puppets help teachers improve classroom talk. In the study by Simon, Naylor, Keogh, Maloney and Downing (2008), puppets were used in science lessons where a puppet had a problem that needed to be solved. When teachers used puppets, they were more likely to ask open, thought-provoking questions, which created opportunities for the children to talk. The study contrasted this with conventional science lessons, which were more dominated by recall questions. The use of puppets enabled the teachers to become more dialogic in their science teaching and introducing puppets into the classroom influenced some fundamental aspects of their pedagogy. Several teachers noted how the children were fond of answering the puppet's questions and expressing their thoughts. Puppets also fascinated those children who tended to remain aloof: "Many of the children who would not normally contribute to a discussion took a more proactive role" (Simon et al., 2008, p. 1243).

Hackling, Smith, and Murcia (2011) examined a puppet project and enhancing classroom discourse in primary science. Their findings are consistent with the research of Simon, Naylor, Keogh, Maloney and Downing (2008). In Hackling's et al. (2011) study, most teachers noted that puppets had a positive impact on student engagement and talk. Teachers indicated that increased numbers of students participated in discussions, and students explained things more thoroughly to the puppet than to a teacher (Hackling et al., 2011).

Keogh's, Naylor's, Maloney's, and Simon's (2008) study also had primary science lessons as the context, and it gives evidence of how the role of the puppet can help in generating communication. With a puppet in hand, a teacher can act ignorant:

> *The children empathised with the puppet. They understood the problem that the puppet had, and they felt sorry for the puppet because it had the problem. […] They worked hard to articulate and explain their ideas to the puppet (who doesn't understand), rather than for the teacher (who 'knows all the answers and will know what they mean even if they don't explain well'). (Keogh et al., 2008, p. 146.)*

Keogh et al. (2008) note how a puppet does not have the same status and authorship as a teacher, instead, it is viewed as a peer. A puppet acting as "the least knowledgeable member of the class" also helps children who are not confident enough to talk about their ideas; they are more comfortable talking to a puppet who does not know as much as they do. This increases communication in the classroom (Keogh et al., 2008). Simon et al. (2008) also report on puppets creating confidence. The puppet is regarded more as an equal, and it is less judgmental than the teacher is. Thus, it is easier to talk to a puppet (Simon et al., 2008).

Remer and Tzuriel (2015) report how puppets help to broaden a discussion. When a puppet is used to bring personal examples and experiences to a discussion, children are encouraged to add their examples and experiences. Remer and Tzuriel (2015) also note how a puppet can act as a role model that teaches how to ask questions and to answer with explanations.

A puppet's ability to help children relax generates communication. Çağanağa and Kalmiş (2015) note that puppets can help in developing communicative skills especially because children feel more relaxed when they talk with a puppet than with a teacher. Çağanağa and Kalmiş (2015, p. 8) write: "…the enjoyable atmosphere that the puppets create breaks down the barriers between the teacher and the children." Korošec (2012, p. 34) also notes the relation between relief and easy communication: "A puppet in the hands of a teacher seems to give relief. The child is relieved of his/her fear of authority and can easily establish contact with the environment."

Maharani (2016) has compared Puppet media and Picture media in teaching speaking English. The findings reveal how using puppets is more effective than using Picture media in teaching speaking because puppets are able to make students feel relaxed. Maharani (2016, p. 113) writes: "By using a puppet, students become less inhibited when they are hidden behind the puppet by only handling it to move. The puppet is an ideal springboard for developing speaking skills."

Puppets are useful in establishing a teacher-student interaction. Korošec (2012) uses the notion "indirect communication" to describe a teacher who addresses students through a puppet. The teachers noted that puppets were a helpful tool in establishing contact with children and, in addition, improving their mutual communication (see also Korošec, 2013). The puppet's ability to attract and inspire children made the communication and transfer of information easier. Puppets also helped establish spontaneous communication between students. An important finding is that the puppet is a helpful tool in including shy children in communication (Korošec, 2012, p. 39–40): "For a shy child, the puppet represents protection from direct exposure and makes it easier for him/her to get spontaneously included into the activity." In addition, Korošec (2012) notes how puppets help children with learning and speaking difficulties to participate in communication.

According to Ahlcrona (2012), a puppet can work as a "mediating tool" in communication between children and adults. Ahlcrona (2012, p. 180) explains it in the following way: "It was found that children interacting with the puppet communicated knowledge from different social practices and reflected their own experiences and perceptions against a background of impressions from media, literature and everyday life." Ahlcrona (2012) also describes a puppet's potential to generate unexpected discussion:

> *While conversations between the children and the puppet could take unexpected directions and twists, children initiated and controlled the content in a way that was not usual in other "normal" conversations. Such situations represent a way of making room for children's voices and creating the opportunity for using language and communication in unusual and unexpected ways […]. (Ahlcrona, 2012, p. 181.)*

According to Remer and Tzuriel (2015, p. 362–363) a teacher can use a different language, which has a positive affect on communication: "The puppet allowed for direct communication with the children – mediators reported that the fact the puppet portrayed the persona of a little girl allowed them to speak through her and use childish language, and in this manner, created a form of direct 'eye to eye' communication." Simon et al. (2008, p. 1244) also note the puppet's possibility to use a certain kind of language that affects communication positively: "Children felt that science lessons were easier to understand for a variety of reasons; the puppets used simpler language than the teacher; the puppets spoke more slowly and explained more clearly; […]."

Brėdikytė (2002) introduces the DDP (Dialogical Drama with Puppets) method in promoting a child-teacher interaction. In the DDP method, puppets are incorporated into the presentation of a fairy tale. Puppets and the fairy tale are employed, among others, to stimulate the children's independent creativity. The teacher maintains a dialogue, and thus engages the children. The DDP method is a dialogue-based model in which the child and the teacher act as partners and build together a joint virtual reality. Brėdikytė (2002) describes it as "a new type of pedagogical interaction based on dialogue." It requires successful child-teacher interaction;

> *Participating in the presentation [of a fairy-tale] together with the teacher, the child as if "prepares himself" and "learns" how to replay it on his own. It is also asserted that any form of the child's active involvement and participation in a fairy-tale presentation leads him to its further replaying. Therefore, the teacher's ability to establish individual contact with every child during the presentation is absolutely vital. (Brėdikytė, 2002, p. 39.)*

Remer and Tzuriel (2015) and Korošec (2012) report that puppets have benefits in testing situations by helping children reveal their knowledge.

> *Teachers use puppet activities to test the knowledge of children, without the children being aware of that. We know that fear of exposure often prevents children from revealing all their knowledge. Indirect communication with the puppet makes knowledge-testing easier. What is more, flexible teachers can test children's knowledge in informal and playful situations with puppets. When children prepare a scene connected to a certain topic, they will include all their knowledge and experiences from that field. (Korošec, 2012, p. 36.)*

Supporting positive classroom climate

The climate of a classroom has different dimensions. Evans et al. (2009) present three differentiable components of the classroom climate: academic (pedagogical and curricular elements of the learning environment), management (discipline styles for maintaining order), and an emotional component (affective interactions within the classroom). The emotional atmosphere includes psychological (level of an individual) and social (level of a community) dimensions (see Hannula 2011; Laine et al., 2015). The psychological dimension of the emotional atmosphere (level of an individual) looks at the individual experiences that occur in the class, such as emotions, thoughts, goals, beliefs, values, and motivational orientations (Hannula, 2011; Laine et al., 2015).

Ten studies in the data set (Ahlcrona, 2012; Çağanağa and Kalmış, 2015; Fisler, 2003; Hackling, Smith, & Murcia 2011; Keogh, Naylor, Maloney, & Simon 2008; Korošec 2012; 2013; Maharani 2016; Remer & Tzuriel, 2015; Simon, Naylor, Keogh, Maloney & Downing 2008) bring forward puppets' po-

tential to support a positive classroom climate. The data shows how puppets are helpful tools especially in two dimensions (see Evans et al. 2009): in classroom management and in supporting a positive emotional atmosphere on an individual level, such as in increasing motivation.

Several studies (Çağanağa & Kalmış, 2015; Fisler, 2003; Keogh et al., 2008; Korošec, 2012; Maharani, 2016; Remer & Tzuriel, 2015; Simon et al., 2008) refer to the puppets' potential to generate motivation, interest, and attention. For example, Keogh et al. (2008, p. 146) report about the benefit of puppets in generating motivation and interest in primary science lessons. A puppet with a problem generates motivation: "...children were highly engaged by their conversations with the puppet, motivated to solve the problem presented by the puppet, and eager to let the puppet know what they had found out." Fisler (2003) describes how a puppet theatre can provide an enjoyable way to encourage the development of reading skills:

> *Evidence of reading development accompanied evidence of excitement and interest in reading as a creative act. The students [in elementary school] participated in activities combining these goals with the pleasures of making puppet theatre, as well as the opportunity to engage mathematical, visual art, oratorical, and movement skills, with consideration of issues of identity construction in literary and, subsequently, performative representation. (Fisler, 2003, p. 36.)*

In Remer's and Tzuriel's (2015, p. 362) study, the puppet's ability to generate interest, attention, and motivation in the children was the most frequently mentioned contribution of the puppet: "From their [the mediators'] description, it was apparent that the interest, attention and motivation of children are intertwined. The effect of the puppet on one of the factors, for the most part interest, instantly raised the others – attention and motivation." Maharani's (2016, p. 122) study reveals that puppet media is motivating because it is something new for students: "[...] since puppet media is a new media for the students, the unique interesting and joyful learning experience of puppet media make them more enthusiastic in the classroom activities than monotonous learning media they used to be using."

In Çağanağa's and Kalmış's (2015) study, teachers describe how puppets attract interest. Children are eager to participate in the lessons, and in the enjoyable environment the learning is easy. Puppets make the children concentrate, which is helpful for the teachers. Korošec (2012, p. 42–43) describes the connection between generating motivation and attention in the following way:

> *The puppet takes them [children] over and they focus all their attention on communicating with it. Teachers are surprised by the role of the puppet, as it supersedes their authority. The animated puppet draws the attention of children, who are willing to do the work carefully and quickly for the puppet. (Korošec, 2012, p. 42–43.)*

In addition to motivating students, a puppet supports a positive emotional atmosphere with its ability to relax students and help them participate. Korošec (2012) writes that the puppet is a working partner that creates a special atmosphere in the classroom by relaxing the children (see also Korošec, 2013), releasing tension, and including every child in the work. A puppet has an important role in the classroom. Korošec (2012, p. 34) describes a puppet that accompanies children throughout the year:

> *Children confide in the puppet, have relaxed conversations with it, they want to touch it and stroke it. They accept the puppet as a live member of their group; they admire it and include it actively in their work. The puppet emotionally overwhelms children; it is their confidante and their ally. (Korošec, 2012, p. 34.)*

The confidence of teachers can also benefit from using puppets. In Remer's and Tzuriel's (2015) study, mediators describe puppets helping them to raise their own self-confidence; a teacher can also use the puppet "as a type of cover."

A puppet can provide an alternative attitude towards mistakes. Children are less embarrassed when they do not know something if they have a puppet in hand; a puppet that makes a mistake is funny (Korošec, 2012; see also Simon et al., 2008). Keogh et al. (2008) note how a puppet can be the one who knows the least in the classroom. Children who might be unsure about sharing their ideas can feel it more comfortable to participate when there is a puppet who does not know as much as they do (Simon et al., 2008).

A puppet can be a helpful tool when there is a need for creating a comfortable atmosphere quickly. Keogh et al. (2008) remark how there is "an adjustment period" when a new teacher meets the children for the first time and before the relationship has been developed. When a puppet is used, the adjustment period can be remarkably shorter, and engagement can be generated quicker (Keogh et al., 2008). Korošec (2012) also notes how a puppet can make the first meeting easier and help establish contact.

In addition to creating a relaxed atmosphere, puppets can make lessons fun (Korošec, 2012). Remer and Tzuriel (2015) report how puppets are able to add humor and create "a playful atmosphere." In their study, the mediators describe how the puppets influence creating a cheerful atmosphere in the group and making children laugh a lot. In Simon's et al. (2008) study, children commented on having fun with puppets: enjoyment and engagement were seen to have a strong connection in many interviews.

A puppet can provide a lookout on children's feelings. Korošec (2012) notes how a puppet can be a teacher's tool in getting to know the children and establishing individual relationships with them. When children express their feelings through puppet activities, the puppet enables the teacher to notice such feelings and experiences that would have gone unrecognized. Negative emotions can be expressed with a puppet in an acceptable way (Korošec, 2012). Korošec (2012) describes how a puppet can transmit children's feelings and thoughts:

> *Such children [shy and unconfident and those who regularly disturb lessons] often show their skills and express their emotions in puppet play but not in direct communication. Puppets sensitise the teacher to noticing the individual emotions and characteristics of children, which would be impossible during classic lessons. [...] Children use symbolic play with the puppet that is not dictated by text or the teacher, to solve real life conflict situations on a symbolic level. Children can thereby communicate their problems to the teacher and resolve their frustration in a fictitious situation. If the teacher is included in the child's play as one of the characters, she can observe and get to know the child from a different perspective. (Korošec, 2012, p. 43, 44.)*

Puppets help establish good behavior and are a helpful tool in class management. In Korošec's (2012) study, teachers note how puppets help decrease discipline problems. They report that the children are less aggressive. Puppets made even those children participate who tend to disturb lessons (Korošec, 2012.) In Çağanağa's and Kalmış's (2015) study, teachers report how a puppet can be used as "a classroom management tool." When the teacher does not manipulate the puppet, it can be put in a place where the children can clearly see it; the puppet can watch the class with the purpose of creating silence in the classroom. (Çağanağa & Kalmış, 2015.) In Simon's et al. (2008) study, three teachers note how the puppets improve behaviour; a puppet looking out for good behaviour is a helpful tool.

In Remer's and Tzuriel's (2015) study too, mediators report that the puppet helps maintain rules of behavior. It was noted in that study how the puppet did not have to directly comment on misbehavior; it could just have a role in monitoring. Remer and Tzuriel (2015, p. 363) write:

> *This role was carried out in two ways: firstly, in a preventative manner by creating an interesting learning atmosphere for the children, raising the attention level and decreasing the disruptions, and secondly, in an indirect manner, when the puppet told about her proper behavior in her kindergarten. (Remer & Tzuriel, 2015, p. 363.)*

Enhancing Creativity

Puppets have potential in strengthening creativity. According to Jean Piaget's (1962) theory, puppet play helps students develop creative skills and cognitive skills by forcing them to use their imaginations. They make up the roles, the rules, the situations, and the solutions. They have to listen and understand the information before they transcode and use it to deliver in puppet play. In the data set, four studies (Ahlcrona, 2012; Brėdikytė 2002; Korošec, 2012; 2013) highlight the potential of puppets to encourage creativity.

Korošec (2012; 2013) reports that preschool/primary teachers see puppet activity as a possibility for creative expression. Puppet activities challenge children and provide a possibility for them to express themselves creatively.

Ahlcrona (2012) reports about children's ability to create something new when they play with a puppet. Playing with puppets may enable children "to overstep the boundaries between the 'actual' and the 'imagined' world," enhancing creative dialogues. Although current issues of today usually provide the topics for activities, puppets also inspire students to imagine the future (Ahlcrona, 2012, p. 181): "[...] by overstepping the limits of the possible and imagined worlds, puppets also generate visions of a potential future." Ahlcrona (2012, p. 181) describes the possibilities of puppets: "During the time of my research, the children expressed how they imagined that the puppet thought, felt, knew, understood, learned, and had ideas and skills, indicating their interest in the mental processes and abstract thinking of other people."

With help of puppets, it is possible to create an environment that supports students' creativity. Brėdikytė (2002) reports that the DDP (dialogical drama with puppets) method in the pre-school classroom creates an environment that promotes the child's creative self-expression. The DDP method contributes to the child's independent dramatic play and broadens the contents and forms of playing. In addition, it stimulates verbal activity and creativity when children make up their own stories and fairy-tales. Brėdikytė (2002) describes the puppet as a tool of expression and creativity:

> *Drama with puppets helps preschoolers, with the assistance of moving puppets, to express and show things, which cannot be expressed or shown only through verbal mediums. Thus, for the children of the age in question puppets become an additional means of self-expression, helping them better understand and express their ideas and actions. (Brėdikytė, 2002, p. 43.)*

Fostering co-operation within and integration into a group

Puppets and puppetry have the potential to help students integrate into a group and learn how to work cooperatively. In the data set, four studies (Korosec, 2012; 2013; Mehrotra, Khunyakari, Natarajan, & Chunawala, 2007; Remer & Tzuriel, 2015) highlight co-operation within and integration into a group.

Korošec (2012) notes how "[s]ilent and shy children, show-offs, hyperactive and lonely children" need special support, and how direct communication with them may be unsuccessful, leading to rejection. Inclusion into the group can cause difficulties. Here, a puppet can be a helpful tool (Korošec, 2012).

> *The puppet is a medium which helps the teacher with the integration of individuals into the group. It works as a medium for relaxation and release of tension. When the puppet is being created (if the teacher has a creative and open approach), the child feels accepted and can prove himself/herself in his/her own way. In this way, the child can find his/her place in the group. (Korošec, 2012, p. 39.)*

In her other study, Korošec (2013) reports on the effect of puppets in socialization. The puppet's important influence on socialization in a class is clearly recognized in the data. When children create puppets and play with them, they become more self-confident. As a result, schoolmates of these children start to appreciate and accept them after their success. (Korošec, 2013.)

In Remer's and Tzuriel's (2015) data, most of the mediators (84%) noted that all the class cooperated with the puppet and regarded it as a group member. Puppets also fascinated the children considered quiet and introverted. Cooperation with the puppet helped them participate (Remer & Tzuriel, 2015).

Mehrotra, Khunyakari, Natarajan, and Chunawala (2007) report on the trials of a Design and Technology (D&T) unit carried out in Indian middle schools in different sociocultural settings with a focus on collaborative learning. The design and technology unit includes a unit on puppetry, which involves making a puppet and staging a puppet-show. The focus is on the potential of a design and technology unit to provide collaborative learning situations, that is, puppetry is not in focus, but it is a context for a design and technology task. However, the criteria for choosing puppetry is connected to co-operation (Mehrotha et. al., 2007, p. 3): "Each group had to make a puppet and all the puppets made by them were needed to put on the show, thus involving a second level of collaboration, with the entire cluster collaborating." The report shows that the unit on puppetry worked well as a context for cooperation in design and technology. For example, the data also showed how the task accomplished "informal role-adoption" when students adopted different roles within and across groups. Overall, Mehrotha et al. (2007) note how participating in a D&T unit has a great significance.

> *As collaboration is not a regular practice in the Indian classrooms, we initially found it difficult in the trials to get students to work in groups to achieve a common goal. The D&T unit on puppetry was so designed as to encourage students to investigate, analyze, synthesize, and evaluate ideas in groups. [...] The unit on puppetry was a D&T unit planned not only to appeal to Grade 6 students from different regions and girls as well as boys but also to engage them in collaborative learning. The inclusive and collaborative nature of the unit is appropriate for the multicultural Indian context. (Mehrotha et al., 2007, p. 10.)*

Changing Attitudes

Puppets and puppetry have potential in changing attitudes when a puppet helps a child take a new perspective on a situation. In the data set, two studies (Dunst, 2012; Whiteland, 2016) bring forward puppets' potential to change attitudes. Whiteland (2016) has investigated how attitudes may change when older adults and children participate in an intergenerational art project in which they created hand puppets, wrote scripts, and dramatized stories. Based on the statistical analysis, the data did not show any significant change in the students' attitudes toward older adults and aging. However, there was evidence that students constructed new meaning in their understanding of this topic. Overall, the intergenerational puppet-making workshop was a mutually beneficial experience. (Whiteland, 2016.)

Dunst (2012; see also 2014) reports about changing attitudes toward and knowledge of individuals with disabilities: puppet shows provide an effective intervention among elementary students. Dunst (2012, p. 455) describes the benefits of puppetry: "What is perhaps most encouraging is the fact that such a simple intervention had discernable positive effect, and that the intervention could be delivered to a larger number of students on a single occasion."

Discussion and Conclusion

Puppets have been used in education, but systematic studies that assess and evaluate their impact on learning and teaching are in the infancy stage. We conducted a review of the literature on puppets in education and identified five potential uses that were mentioned in scholarly articles. The potential uses are (1) generating communication, (2) supporting positive classroom climate, (3) enhancing creativity, (4) fostering co-operation in and integration into a group, and (5) changing attitudes.

One study (Korošec, 2012) reports that puppets help in memorising poems. However, that was not a main finding, and no other studies report on the puppet's potential in helping memorisation, and for this reason, this finding was not included in our potential uses.

The data consists of scholarly articles. An overview on pedagogical, non-scholarly articles supports the findings. For example, the puppet's potential to generate communication has been identified in pedagogical studies (see e.g. Belfiore, 2013; Gobec, 2012), and puppets are noted as a helpful tool to include shy children in communication (see e.g. Belfiore, 2013; Kroflin, 2012a; Majaron, 2002). Many educators have also reported that the use of puppets in classrooms makes the children feel more engaged and motivated (see e.g. Debouny, 2002; Gobec, 2012; Kroflin, 2012b; Lowe & Matthew, 2000). Not only articles but also books introduce the benefits and possibilities of puppets as pedagogical tools (see e.g. Torén, 1999; Taras-Vaulasvirta, 2003) and focus on giving instructions on how to use puppets (see e.g. Arasmo & Alopaeus, 1992). Obviously, non-scholarly articles or books do not include data or exact methodology. However, pedagogical studies, many of them based on the author's (teacher's) own experiences, are useful tools for teachers using puppets and searching for new teaching ideas or a background for using puppets.

Puppets certainly have benefits in education. However, children may also have reservations about using puppets (see e.g. Simon et al., 2008); teachers should take this in account. In addition, it must be noted that the novelty of using puppets may increase children's interest. Çağanağa and Kalmış (2015) report how using the same puppet for too long bores children. The children lose interest when they already know what is expected to happen.

Correspondingly, not all teachers automatically benefit from using puppets. For example, Hackling et al. (2011) report on teachers who do not feel confident using puppets and engaging students in learning. Difficulties occurred, for example, in transitioning between puppet and teacher talk and developing personas for the puppets. In Remer's and Tzuriel's (2015) study, 11% of the mediators reported that they did not always enjoy working with a puppet.

Papers selected for this review were very diverse in terms of the aims of the research, the underlying theoretical frameworks, and the methodologies used. This diversity reflects the interdisciplinarity character of the area, the varied backgrounds of the researchers, and their wide-ranging interests in puppets. The five themes developed in the current study, looking at potential uses of puppets, helped to provide a framework for organizing and understanding the use of puppets in education. To be applied most effectively in education, potential uses should not be considered solely as independent themes. In contrast, the potential uses should be viewed as complicating meanings rather than simplifying them. At times, it may even be difficult to describe one use without mentioning how it might be layered with another. For example, puppets have potential in supporting a positive classroom climate, and simultaneously, they also generate communication by creating a relaxed atmosphere.

The most notable point of the current review was the diversity of research on the positive impacts and outcomes associated with puppets. The potential uses for puppets in education identified in this article are by no means new, nevertheless, they represent largely untapped resources. The frame presented herein might prompt the more active integration of puppets into education. We suggest that a puppet should be seen as a pedagogical tool in its own right and not merely as a medium.

The potential uses of puppets proposed in the present study not only provide a framework for organizing these diverse outcomes and impacts of using puppets, but they also highlight the persistent difficulties associated with classifying learning outcomes. While empirical evidence concerning the potential of using puppets was found in the current review, there is need for more research to provide more rigorous evidence of effectiveness of the puppets. More studies would also help extend our understanding of the nature of engagement in using puppets. To encourage the use of puppets in learning, it is essential to develop a better understanding of the tasks, activities, skills, and operations that different kinds of puppets can offer and examine how these might match desired learning outcomes. As with other educational interventions, it is also important to consider how puppets are integrated into a student's learning experience.

The current review has limitations. It was limited by the search terms used, the journals included, and the time period of papers published. However, the papers discussed in this literature review provide a snapshot of the empirical research on the outcomes and impacts of puppets that is representative of the state of the art at the time of publication. The review excluded speculative and theoretical papers because it was important to ground our understanding of outcomes and impacts of using puppets in research evidence rather than in speculation.

Based on the literature review, it can be concluded that puppets are beneficial in education. Puppets should not only be nice products that perform in a well-prepared puppet show, but puppets should be integrated into various contexts to support learning. Therefore, we suggest that puppets should be integrated into teacher education. Teacher education should provide diverse possibilities to implement puppets in learning activities to make this media attractive for teacher students and their future students in schools.

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A Story-Based Analysis of Elementary Fourth Graders' Views on Respecting Differences

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Abstract

Respecting differences involves showing respect to individuals just because they are human beings and seeing every difference as natural. It is among the values that children need to acquire at early ages. Thus, there has been a need to reveal students' views on this value. The primary aim of this study was to examine elementary school students' views on respecting differences. Qualitative research method was employed in the study, and the participants were elementary fourth graders. The data were gathered through a story formed by the researcher, and questions related to it in moral, intellectual and empathetic dimensions. The students were also asked to create a poster about respecting differences. Descriptive analysis was used in the analysis of the students' answers, and content analysis was performed to examine their posters. The results showed that the students answered the questions in the moral dimension in a way that reflected their developmental characteristics. In addition, they perceived respecting differences mostly in the context of physical differences. In the empathetic dimension, the students stated how they would feel in the sample case provided. In their posters, they did not address universal values to a great extent. In this respect, sources such as current issues, sample cases and problems can be used in instructional processes to develop multiple perspectives regarding this value.

Keywords: Values, Respect, Respecting Differences, Morality, Intellectuality, Empathy

Introduction

Values can be defined as the principles that direct the lives of individuals. They act based on their values in situations when interpreting events, analysing what has happened and making decisions. The values that individuals have are also crucial for the continuity of the society they live in.

Values can be considered as the state of exhibiting terminal behaviours that overlap with the customs and traditions of the society (Ulusoy, 2017). Values constitute behavioural patterns due to including principals and beliefs that generally guide behaviours. For this reason, values have the characteristics of integration and organisation (Halstead & Taylor, 2000). In other words, "values as desirable transsituational goals, varying in importance, that serve as guiding principles in the life of a person or other social entity" (Schwartz, 1994, p. 21). Values are not innate or inherited traits but are acquired in the course of life. As they live, individuals gain the values that would determine their personality, perspective and behaviours. Therefore, individuals' realising the values and adopting them are closely related to an educational process that is referred to as values education (Yeşil & Aydın, 2007).

Values education is an important process that ensures the continuity of societies by enabling individuals' internalisation of values. By means of values education, individuals are able to transfer their culture to future generations. Considering that another crucial function of schools is cultural transfer, the importance of values education becomes even more obvious. In this respect, the Turkish Ministry of National Education (MoNE) (2018) indicates that values are a collection of principles that form the perspective of educational curricula. Accordingly, the values of justice, friendship, honesty, self-control, respect, love, responsibility, patriotism and helpfulness are included in the curricula as basic values.

Respect, which is one of these basic values included in the curricula, refers to a set of values that affect every area of life and are needed in human relationships (Öksüz & Güven, 2012). It can be defined as the feeling of importance and value in individuals. In fact, respect is one's original identity (Yılmaz, 2016). The value of respect can be addressed in different dimensions as in respecting differences, the cultural heritage and the elderly.

Respecting differences involves showing respect to individuals just because they are human beings and seeing every difference as natural. In this sense, it can be claimed that this value establish peace among people and teach individuals to protect each other's rights (Capowski, 1996: cited in Topçubaşı, 2015). Differences essentially exist in human nature. Elements such as age, gender, race, ethnic origin, language and religion that distinguish people from each other can be defined as differences (Atasoy, 2012).

Considering that individuals are subjective entities, it is accepted as natural whether they adopt or appreciate certain difference or not. However, the respect that individuals show to differences prevents conflicts that would not be solved otherwise. This is because individuals should be respected as it is a basic need that should be met for developing a healthy personality. While they more easily show respect to traits such as race and colour that cannot be changed, they expect differences in views or beliefs to be changed (Öksüz & Güven, 2012). A peaceful society can be created if respecting differences is taught starting from childhood. People percept differences as strength of the society via the value of respecting differences.

Respecting differences, help children adopt a positive attitude towards differences, understand other who have different characteristics and form new opinions about them (Hall, 1999: cited in Ekmişoğlu, 2007). With regard to the education

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that involves respecting differences, the Foundation for the Support of Women's Work – FSWW – (2006) highlights noticing prejudices and trying to eliminate them, showing respect to differences by understanding the behaviours of others and attempting to sympathise with them. This is because respecting differences should be adopted in order for different cultures to live happily together (Kanatlı-Öztürk, 2018). Sources such as sample cases and current issues can be employed for teaching in introducing this value to students, and having them to acquire affective characteristics like empathy, tolerance and accepting others as they are (Deveci & Çengelci-Köse, 2016). In this context, it can be argued that respecting differences is an issue that should be attached great importance for social continuity and peace.

In the national literature on respecting differences, there are studies that received the views of preschool teachers on this value (Pekdoğan, 2018; Ekmişoğlu, 2007) and those that attempted to teach it by means of different curricula (Çatlak & Yiğit, 2017; Eren, 2015; Kanatlı-Öztürk, 2018; Topçubaşı, 2015). In the international literature on respecting differences were associated with multiculturalism and antibias education (Derman-Sparks, 1989; Oslon, 2003; Garmon, 2004; Endres, 2002; Weisman & Garza, 2002). It seems that the existing research mostly focused on developing the value of respecting differences and was conducted at the preschool level. Yet, no studies have been published which set out to reveal elementary school students' views on respecting differences based on a story. Therefore, this study focuses on perspective of primary school students on respecting differences with moral, empathic and intellectual questions. Findings of the study which include answers of students in moral, empathic and intellectual dimensions will be discussed considering development level of students.

Thus, this study is significant in terms of revealing students' perceptions of respect for differences and promoting teaching value of respecting differences. In this sense, this study aimed at examining elementary fourth graders' views on respecting differences by making use of a story. The following research questions were thus addressed in the study:

- What are elementary fourth graders' views on respecting differences

  in terms of the moral dimension?

  in terms of the intellectual dimension?

  in terms of the empathetic dimension?

- How do elementary fourth graders' express their views in their drawings about respecting differences?

Method

Research Model

This study is a descriptive attempt to reveal elementary fourth graders' views on respecting differences. Interpretive design, an umbrella term in qualitative research, was adopted in the study in which qualitative data were collected. How individuals interpret their experiences, the meanings they attribute to such experiences and how they construct them are addressed in this kind of studies (Merriam, 2002). Accordingly, how fourth graders perceived the concept of respecting differences was examined in the present study by means of a story created for research purposes.

Participants

The participants of the study were fourth-grade elementary school students. Convenient sampling was used in the selection of the participants. In this type of sampling, an immediate and easy-to-reach case is chosen (Yıldırım & Şimşek, 2013). A total of 98 elementary fourth graders participated in this study. Fifty-one of these students were female and 47 were male.

Data Collection

The data were collected through an instrument developed by the researcher. This instrument included a story about respecting differences that was prepared by the researcher, and moral, intellectual and empathetic questions related to the story. In addition, the students were asked to reflect the value of respecting differences by drawing a poster on the issue and writing down what they expressed in the poster. In this scope, the instrument contained a story about respecting differences, and a total of 11 items including 10 questions related to the story and a task asking students to create a poster. After it was developed, the instrument was presented to a group of six experts including two in social studies education, one in educational curricula and instruction and three in elementary education, for their feedback. Three elementary school teachers and three fourth-grade students also provided opinions. Based on the feedback received, the instrument was finalised for administration.

The first part of the instrument included the story written by the researcher and the related questions. This is because stories can present a social event/issue to students in the form of opposite views or perspectives like good/bad or right/wrong. Besides, stories enable students to see the contrasts, conflicts and differences within life (Kabapınar & Baysal, 2004). In this way, the students were encouraged to reveal their perspectives of respecting differences by means of a story.

The students were asked questions in moral, intellectual and empathetic dimensions with regard to the story. Rowe and Newton (1994) assert that moral, intellectual and empathetic categories of analysis should be employed in story analysis. Therefore, the instrument contained moral questions on whether the characters in the story did right or wrong, intellectual questions on the characters' justifications for certain behaviours and empathetic questions in which the student put themselves in the shoes of the characters (Kabapınar & Baysal, 2004). Thus, the students were enabled to reflect the value of respecting differences in cognitive and affective dimensions.

The data gathering instrument also included a task by which the students were asked to prepare a poster regarding the value of respecting differences and explain what they wanted to express in their posters. Revealing children's perceptions through pictures is a reflective approach in terms of understanding their inner worlds (Belet & Türkkan, 2007). In this way, the students' perceptions of respecting differences were also demonstrated through posters.

The data were gathered by the researcher herself, and she gathered the data in two class hours. After the copies of the instrument were distributed to the students, any questions that they had about the items were answered. The instrument employed in the study is as follows:

> *"A cheerful black rabbit with one ear missing lives in a jungle. As she wanders around the jungle all alone, she comes across a squirrel. She offers the squirrel if they can be friends. Because she believes that if they played together, they would have a good time. But the squirrel turns down the rabbit and makes fun of her by saying "You don't have your other ear, and your colour is different from mine". The rabbit gets really upset and starts thinking how she could be friends with the squirrel. She thinks about changing her colour with paint and making an ear for herself with hard leaves in the jungle. But then she decides that all these are not right. One day, while walking around the jungle, the squirrel gets a thorn on his foot. It is very painful. He comes to his friends. When they see that he can't walk and*

run properly, they don't accept him to their play. The squirrel gets really upset and remembers what he said to the rabbit. He then looks for the rabbit in the jungle and finds her. He apologises from her and says they can be friends if she wants. The rabbit feels quite happy with the squirrel's apology and offer. She says she can help him walk and share her food with him. After that day, the rabbit and the squirrel become good friends, and all the other animals in the jungle show them as the example of friendship."

1. Do you think the squirrel's teasing the rabbit by saying "You don't have your other ear, and your colour is different from mine" is right? Why?

2. Do you think the squirrel's friends not accepting him to their play is right or wrong? Why?

3. Do you think the rabbit's forgiving the squirrel and helping him is right or wrong? Why?

4. What are individual differences?

5. What do you think respecting differences is?

6. What does the saying "Differences are the spice of life" mean?

7. What do you think the best title for this story would be? Why?

8. If you were the squirrel, what would you do in the face of the rabbit's offer for friendship? Why?

9. When you put yourself in the rabbit's shoes, how would you feel with the squirrel's teasing?

10. If you were the squirrel to whom the rabbit helps, how would you feel? Why?

11. Prepare a poster about respecting differences in the space below. (Write down what you want to express on the back side of the paper.)

Data Analysis

The descriptive analysis technique was employed in the study to analyse the answers provided for the questions related to the story. In accordance with descriptive analysis, data are summarised based on pre-set themes (Yıldırım & Şimşek, 2013). In the present study, the data were analysed in the context of the questions included in the instrument.

Content analysis was used in the analysis of the data regarding the posters. In this analysis, it is aimed to reach the relationships that can provide further explanations for the data (Yıldırım & Şimşek, 2013). In this regard, themes were formed based on the students' posters and what they wanted to express in their posters.

The research data were independently analysed by the researcher and another field expert in social studies education. Later in the process, the researcher and the outside researcher discussed the points in which they had agreements or disagreements, and accordingly the analysis was completed. Lastly, specific codes (i.e. S1, S2, etc.) were used in the presentation of the findings while providing direct quotations.

Findings

In the study, the findings were reported with respect to the research questions. The themes were presented in tables, and direct quotations from the students were provided.

Findings Regarding the Moral Dimension

In the framework of the sample case given in the study, the findings regarding the moral dimension are presented in Table 1.

Table 1. *Findings regarding the moral dimension*

Teasing	*f*
Differences being natural	20
A bad behaviour	22
The possibility of experiencing the same	5
Being compatible with others	7
Hurting others	10
Not being discriminatory	10
Personality traits being more important	7
Exclusion from the Play	
Lack of empathy	21
Togetherness	11
The right to play	24
Selecting games suitable for differences	8
Punishment	5
Being Helpful	
Showing what is wrong	9
Being good despite bad actions	7
Not feeling resentment	8
Apologising	6
Learning a lesson	18
Forgiving	18

As is seen in Table 1, the findings regarding the moral dimension were gathered under the themes of teasing, exclusion from the play and being helpful based on the questions included in the instrument. In this respect, for the question "Do you think the squirrel's teasing with the rabbit by saying 'You don't have your other ear, and your colour is different from mine' is right? Why?", which examines whether teasing is right or wrong based on the sample case, all of the students stated that this behaviour was wrong. The students' justifications for this answer included that differences were natural, teasing was a bad behaviour, they had the possibility of experiencing the same situation, individuals should be compatible with others, teasing would hurt others, one should not be discriminatory and personality traits were more important than physical characteristics. One of the students who thought that teasing was wrong because differences were natural said, "All living beings have different characteristics, even though they may look bad (S9)," while another student said, "Because everyone is different from each other. Our differences make us who we are (S33)." One student who thought teasing was a bad behaviour explained his argument by saying "Making fun of other people's physical traits is not a good behaviour (S18)." Another student explained her justification by asserting "The same thing can also happen to him (S32)." One of the students who thought personality traits were more important than physical characteristics emphasised one's character by saying "You should look at the beauty of one's heart, not his/her appearance (S18)." The students thus argued that teasing with one's differences was wrong, and differences were only natural.

As can be seen in the table, for the question "Do you think the squirrel's friends not accepting him to their play is right or wrong? Why?", which examines whether the behaviour of excluding one from the play due to differences was right or wrong, most of the students thought this behaviour was wrong. Their justifications included the lack of empathy, the importance of togetherness and that everybody had a right to play. Moreover, the students stated that games suitable for differences should be played. However, five of the students thought the exclusion from the play was right because the squirrel needed to be pun-

ished for his previous behaviour against the rabbit. One of the students who argued that the exclusion was wrong said, "Because they should be kind to the squirrel about whether he can play or not, they should show some empathy (S6)" and thus highlighted the lack of empathy. Similarly, another student who pointed to the lack of empathy said, "Because they should show empathy and help him, accept him to their play (S86)." One student who expressed the importance of togetherness said, "Because nobody should be excluded, unity and togetherness are important (T27)." One of the students who thought that everybody had the right to play explained his view by saying, "Because everybody has the right to play. Instead of not accepting him to the play, they should have asked what happened to his foot (S46)." Another student interpreted this issue in terms of individual rights by saying, "Everyone has the right to play no matter what (S52)." One of the students who argued that situations suitable for differences should be considered, and said, "The squirrel should have played, too. For instance, if they were playing football, he could be the goalkeeper (S32)." A similar view was also stated by another student: "They could pick a game that he could play with that foot (S85)." One student who thought this behaviour was right said, "Because the squirrel did the same thing before, he deserved it (S41)," while another said, "He did it, too. He needed to get punished to understand his mistake (S64)." Consequently, most of the students were found to think that this behaviour, the exclusion of the squirrel from the play, was wrong in terms of the right to play.

As can be seen in the table, for the question "Do you think the rabbit's forgiving the squirrel and helping him is right or wrong? Why?", which examines the helpfulness in the sample case, all of the students thought helping out the squirrel was the right behaviour. The students justifications for their view included forgiveness, one's having learned a lesson, showing what is wrong, not feeling resentment, being good despite the bad and apologising. One of the students highlighted forgiveness by saying, "Everybody deserves another chance. We should forgive them (S27)", whereas another student featured one's having learned a lesson by asserting, "Because the squirrel learned his lesson as he understood what he had done was wrong (S28)." One student who thought that individuals who exhibit a wrong behaviour should be told so said, "We should correct our friend's mistake (S23)." One of the students who pointed out that there should be no resentment towards others said, "People get offended, and then make peace. It is important to make the peace afterwards. Nobody should resent another person (S46)." The students who explained their views by saying, "You don't respond to a bad action with another bad action (S6)," and "We should help them even if they did wrong to us (S10)" argued that individuals should behave kindly towards others even in the face of a bad action. Therefore, it can be argued that all of the students cared about helpfulness.

Findings Regarding the Intellectual Dimension

The findings with regard to the intellectual dimension are presented in Table 2.

As is seen in Table 2, the findings regarding the intellectual dimension were gathered under the themes of definition of individual differences, definition of respecting differences, differences being the spice of life and the title of the text based on the questions included in the instrument. The students defined individual differences as being unique to the individual, and physical characteristics, feelings and views and interests being different. Regarding this concept, most of the students made reference to physical characteristics. One of the students who defined individual differences as physical characteristics being different said, "It is about skin colour, height, eye colour and weight being different (S6)," including physical characteristics in her definition. Another student said, "For instance, my eyes are black, yours are green (S24)" giving an example about the colour of eyes. One student who highlighted the difference in interests said, "One person likes football, another person likes volleyball, another likes playing the piano." One of the students who regarded uniqueness as an indicator of individual difference asserted, "These are the characteristics that change for every individual (S16)." Another student who defined the concept as "the change in an individual's feelings like respect, compassion, kindness (S77)" explaining the differences in feelings with examples of values. As a result, the students explained individual differences mostly with examples related to physical characteristics.

Table 2. *Findings regarding the intellectual dimension*

Definition of Individual Differences	*f*
Being unique to the individual	16
Physical characteristics	39
Feelings and views	10
Interests	24
Definition of Respecting Differences	
Tolerance	25
Empathy	6
Accepting individuals as they are	5
Not teasing others	16
Not being discriminatory	5
Making friends	3
Differences are the Spices of Life	
Being open to novelties	12
Having distinguishing characteristics	11
Making life more beautiful/less boring	52
Title of the Text	
The rabbit and the squirrel	27
Our differences/Respect to differences	42
Friendship	7
Discrimination	8
Helping each other	2
What goes around comes around	2
He who laughs at other's misfortune may soon meet the same fate	1
Different but happy	1
A friend in need is a friend indeed	2

As is seen in the table, the students explained the value of respecting differences with tolerance, empathy, accepting individuals as they are, not teasing others, not being discriminatory and making friends. One of the students who defined respecting differences in relation to tolerance said, "It is about approaching others with tolerance, showing them tolerance (S5)." Another student said, "It is about not teasing others because of their differences (S17)" mentioning what behaviour would be wrong. One of the students who defined respecting differences as "showing empathy (S60)" highlighted empathy, while one student emphasised unconditional acceptance by saying, "It is about seeing individuals as they are (S6)", and another student provided an example about disability while explaining discrimination by saying, "For instance, if we have a friend with disability, we should also include him in the play, not exclude him (S22)." All in all, the students were observed to relate respecting differences with tolerance the most.

In the intellectual dimension, the students were asked what the saying "Differences are the spice of life" meant? Most of the students answer this question by saying that differences made life more beautiful and less boring. Furthermore, some of the students associated this saying with being open

to novelties and difference distinguishing people from each other. One of the students who thought that differences made life less boring said, "Life would be very boring if everyone was the same (S17)", another said "Our life becomes more beautiful with differences (S19)." Another student thought that differences led to the emergence of new ideas by saying "Differences open the way for novelties. Without differences, everybody would think the same way and nothing new would be invented (S27)." One student also stated that differences were the distinguishing features of individuals and thus made reference to physical differences by saying, "If everybody had the same look, nobody would be able to recognise each other, that's why it is good that everybody is different (S38)." In this regard, the students perceived differences as making life better.

In the intellectual dimension, the students were also asked to find a title for the story. Most of the students thought the title "Our Differences/Respecting Differences" would be suitable, directly addressing the text and the questions. Moreover, some of the students wrote titles such as "the rabbit and the squirrel", "Friendship", "Discrimination", "Helpfulness", and "Different but Happy". Additionally, there were students who made use of proverbs including "What comes around goes around" and "A friend in need is a friend indeed".

Findings Regarding the Empathetic Dimension

The findings with regard to the empathetic dimension are presented in Table 3.

Table 3. *Findings regarding the empathetic dimension*

Offer to Become Friends	*f*
Considering personality traits	28
Showing respect	13
Making friends	51
Teasing	
Getting upset	85
Resentment	3
Getting angry	7
Not caring	1
Being Helpful	
Feeling happy	43
Feeling ashamed	19
Feeling angry	2
Feeling regretful	18

As is seen in Table 3, for the question "If you were the squirrel, what would you do in the face of the rabbit's offer for friendship? Why?", the students stated that they would accept this offer. The students accepted the offer due to reasons such as considering personality traits, showing respect and making a new friend. One of the students who thought that personality traits were more important than physical characteristics said, "Because we should look at living beings' personality traits, perhaps he is a good person. I mean we should decide based on personality traits (S81)." Another student who emphasised the respect to differences said, "I would accept it because we should be respectful to differences (S23)." The student that put to the forefront the idea of making a new friend said, "Because I would have another friend (S19)." A similar view was also stated by another student: "I like to meet new people (S10)." It seems that the students cared about making friends and getting to know new people.

For the question "When you put yourself in the rabbit's shoes, how would you feel with the squirrel's teasing?", which is under the empathetic dimension and examines how they would feel if they were the rabbit, most of the students said they would feel upset. Some of the students explained their feelings with resentment, anger and indifference. One of the students who stated that he would be hurt in such a situation said, "I would get upset. Because what he said would hurt my heart (S5)." Another student said, "I would get hurt and resent the squirrel. I wouldn't speak with him again (S44)," indicating that she would show resentment to that behaviour. One student who reported to react to such a situation with anger said, "I would get angry. Because he can't make fun of me (S92)." Another student stated that he would not care about being rejected said, "I would just turn my back and leave. I wouldn't even care (S97)." It can thus be argued that the students were aware teasing is a behaviour that upsets others.

For the question "If you were the squirrel to whom the rabbit helps, how would you feel? Why?", which is under the empathetic dimension, most of the students wrote that they would feel happy. Some of the students, though, stated that they would feel ashamed and regretful, and get angry at themselves. One of the students said, "I would be happy because I would have a good friend (S22)," while another student emphasised shame by saying, "I would be ashamed of my past actions (S3)." The student who questioned the behaviour and featured regret said, "I would feel regret. Because what the squirrel did was not right at all (S6).", whereas another student who mentioned anger said, "I would get really angry at myself, because I made fun of her and then she helped me out (S5)."

Findings Obtained from the Posters

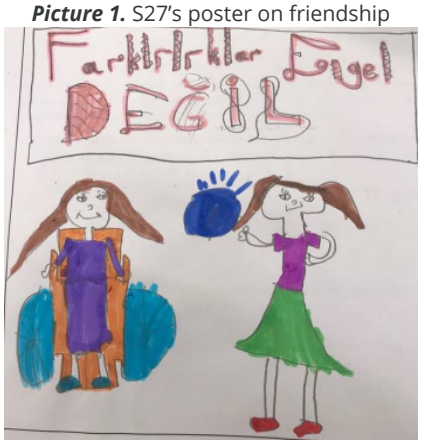
The findings with regard to the posters created by the students are presented in Table 4.

Table 4. *Findings obtained from the posters*

Posters	*f*
Helping each other	10
Peace	2
Equality	6
Happiness	14
Friendship	29
Not teasing others	18

As can be seen in Table 4, the students highlighted friendship, the wrongness of teasing, helping each other, happiness, equality and peace. In other words, they explained respecting differences by featuring these aspects. The students' posters that covered friendship are presented in Pictures 1 and 2.

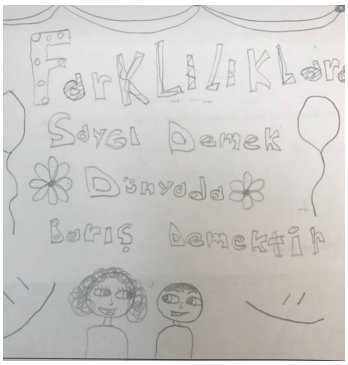
Picture 1. S27's poster on friendship



Picture 2. S34's poster on friendship

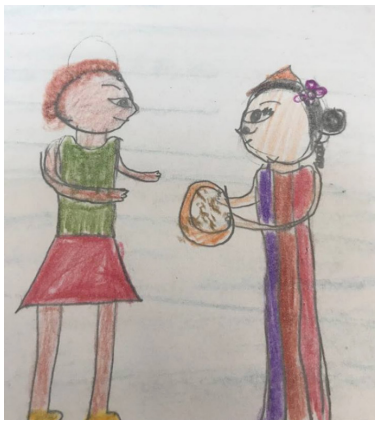
S27 made children holding hands in her poster, and regarding why she drew this poster on respecting differences she said, "We should be respectful to differences. Nobody should be judged just because they are different. Different people can become friends with each other. That is what I expressed in my poster." On the other hand, S34 drew two children, one with and the other without disability. About her poster she said, "One of the kids has a disability, and the other doesn't. They have become friends and can play together without any problems." referring to physical disabilities. One student's poster that associated respecting differences with happiness is shown in Picture 3, and that of another student about peace in Picture 4.

Picture 3. S87's poster (happiness)

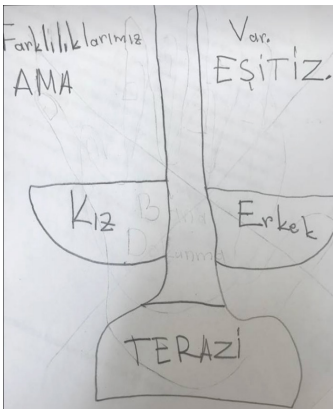


Picture 4. S92's poster (peace)

S87 drew individuals with different characteristics and wrote down slogans. He explained why he drew that poster by saying, "There are people around us who have different characteristics. We live in a peaceful world only when we respect them." putting happiness to the forefront. S92 included a slogan in her poster and drew individuals with different gender. For her poster, she said, "When differences are respected, everybody feels normal and peace is ensured in the world." S1's poster that focused on helpfulness and S77's poster about equality are presented in Pictures 5 and 6, respectively.

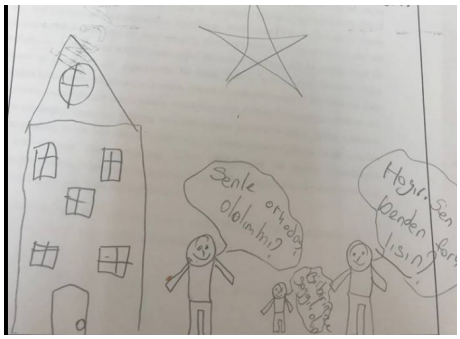


Picture 5. S1's poster (helping each other)



Picture 6. S77's poster (equality)

As can be seen, S1 drew a poster about individuals' helping each other and explained it by saying, "The reason why I drew this poster is that people should help and respect each other even though they may be different." S77 who included a scale and individuals of different genders in his poster emphasised equality with regard to respecting differences. He explained his poster by saying, "Girl or boy, we are all equal, that's what I wanted to express." S24's poster on teasing is shown in Picture 7 below.



Picture 7. S24's poster on teasing

In his poster, S24 included expressions related to differences in speech bubbles. He said, "We should not make fun of individuals' differences, but respect them," to explain why he included those in his poster. Consequently, the students attempted to explain respecting differences mostly with values such as helpfulness, peace, equality and friendship.

Results, Discussion and Suggesiton

In the present study, elementary school students' views on respecting differences were examined by means of a sample case. The students were asked questions in the moral, intellectual and empathetic dimensions, and the value of respecting differences was addressed from multiple perspectives. In addition, they were asked to create a poster on this issue to show how they reflected their perceptions in visuals.

In the moral dimension related to the sample case presented to the students, they were asked to state whether certain behaviours were right or wrong. The students answered the question about teasing by stating that it was the wrong behaviour. They also asserted that people should not be discriminatory, others can be offended, one should be compatible with them and anybody can experience similar situations. They evaluated similar cases they encountered with moral judgements. A moral judgement is defined as a mental process by which a decision is made about whether a behaviour is right or wrong, and how one and others should behave in the face of such a situation (Çileli, 1995). Moral judgements are related to the moral developmental period of children, in which age is a significant factor (Cesur & Topçu, 2010). Therefore, the students' answers should be discussed with reference to the age-related period in moral development theories. According to Piaget's and Kohlberg's moral development theories, the period that complies with the students' age is a period in which social and external rules are important. In other words, children of this period act based on moral norms set by the society (Söylemez, 2017). For this reason, the fact that the students' views regarding inaccuracy of teasing could be explained in terms of social rules. It is possible that the students provided this answer because teasing is regarded as a bad behaviour in the society. Some of the students stated that one should not tease others in such a situation but should be compatible with them because they could be hurt and the same thing could happen to anybody. It can be said that the students are at the traditional level based on Kohlberg's theory. This is because in this level that corresponds to one level higher than social roles, it is important to exhibit good behaviours, make others happy and help them out (Senemoğlu, 2012). In a similar vein, the behaviour of exclusion from the play in the moral dimension was regarded as wrong by the students. Some of these students pointed to the lack of empathy, and thus they again seem to be at the traditional level in which looking from others' points of views is seen important according to Kohlberg (Senemoğlu, 2012) On the other hand, some students responded to this question by referring to the children's right regarding play. In the literature, results of the studies conducted with children, show that the right to play is accepted as one of the children's right by them (Gültekin, Gürdoğan-Bayır, & Balbağ, 2016; Ersoy, 2011; Covell & Howe, 1999). Thus, it is quite normal that the students saw it as a right and thought the exclusion from the play was wrong. Additionally, learning outcomes included in the curricula regarding children's rights may help children develop awareness about right of the play. Besides, only few students thought this exclusion was right because the squirrel deserved a punishment. In another question on helpfulness in the moral dimension, students evaluated being helpful as the right behaviour due to reasons such as forgiveness and one's having learned a lesson. The fact that the students featured punishment in the exclusion, and learning a lesson in helpfulness can be associated with the level of obedience and punishment prior to the traditional level (Senemoğlu, 2012) In addition, punishment is included among the factors that affect moral and immoral behaviours in Gander and Gardiner's (1998) social learning theory (Sözer-Çapan, 2005). Furthermore, in a study at preschool level, Meriç and Özyürek (2018) reported that moral rules required more punishment according to the children, which is consistent with the findings regarding punishment in the present study. Considering the results on the moral dimension, it seems that the students provided different answers depending on the questions. In other words, while they took social rules into consideration in one occasion, they highlighted caring about others in another. In another study, Lickona (1976) revealed that children sometimes provided outside-dependent and sometime independent answers (Sözer-Çapan, 2005). As a result, it can be argued that the students' judgements in the moral dimension reflected the characteristics of their developmental period.

In the study, the students were asked to define individual differences and respecting differences in the intellectual dimension. Most of the students mentioned physical characteristics like height, weight and eye colour while defining individual differences. Thus, it can be said that they mostly focused on observable traits as a difference. Considering their age, they were in the concrete operations period, and they seem to reflect the characteristics of this cognitive developmental period. The students thought of mainly the differences that cannot be changes as an individual difference. The study conducted with elementary school students, Öksüz et al. (2015) reported that the students' drawings on differences included a wider coverage of the differences related to one's appearance. As for the definition of respecting differences, he students mostly highlighted the value of tolerance. Yet, in a study at elementary school level, very few students associated tolerance with respecting differences (Ersoy, 2016) although tolerance is mainly explained with accepting differences, understanding and respect in the literature (Karaman-Kepenekçi, 2004; Witenberg, 2007). Therefore, the results of the current study are supported by the literature. The students also mentioned the ability to show empathy in their definitions of respecting differences. Looking at a situation from another person's perspective brings respect to differences and a democratic attitude (Kabapınar, 2004). Besides, in their study, Uymaz and Çalışkan (2018) formed the theme of respecting differences with regard to the metaphors about empathy. In this sense, the finding that the students mentioned empathy in the context of respecting difference overlaps with the literature. In the intellectual dimension, the students were also asked to explain the saying "Differences are the spice of life". Regarding this saying, they stated that differences made life more beautiful and less boring, enabled individuals to be open to novelties, and distinguished them from each other. As seen in the direct quotations the students did not use a variety of words to explain the saying. Similarly, Çıplak (2005) reported that students produced less variety of words while explaining proverbs. It can thus be argued that children of this age group do not make use of a variety of words to explain expressions such as proverbs, idioms and sayings. Lastly, in the intellectual dimension, the students were asked to find a title for the story. Most of the students wrote titles including "Our Differences/ Respecting Differences" and "The Rabbit and the Squirrel" that were directly related to the text content. Only few students found interesting titles. In a similar vein, Başaran (2014) reported that students had difficulty in finding interesting text titles but could easily find titles that reflected the text content. Based on the questions in the intellectual dimension, the students can be said to define respecting difference in parallel with the literature.

In the study, the students were asked what they would do and how they would feel in the situations narrated in the story. They said they would accept the friendship offer because they would make a new friend. According to Maslow's hierarchy of needs, when individuals meet their physiological and security needs, they want to meet their

need to be part of a group like family or friends. In this regard, it seems normal that most of the students responded to this question as indicating their willingness to make friends. Moreover, the age of the students who participated in the study corresponds to the latency period in Freud's theory of psychosexual development, and to the industry versus inferiority period in Erikson's theory of psychosocial development. In these theories, it is indicated that children of this age group attach more importance to friendship (Senemoğlu, 2012). In the empathetic dimension, the students were asked how they would feel if they were the one who is teased, based on the sample case in the story. Teasing is among the reasons behind conflicts in children of this age group (Gürdoğan-Bayır & Gültekin, 2016). One of the reasons behind children's behaviour of teasing is not being able to understand differences (Topaloğlu, 2014). In this study, the students said they would get upset and angry in such a situation. However, children's reaction of getting upset and angry would cause the continuity of teasing (Alantar, 2010 cited in Gür, 2011). In this context, the students participated in the present study could understand the feelings of an individual who is teased but did not know how to cope with it. It may be caused from emphasizing cognitive behaviour in the teaching process more than affective education. The students were also asked how they would feel if someone else helped them, and they mostly said they would be happy. Helpfulness can be regarded as a morally good behaviour, and such behaviours would make the individual and others feel happy (Montagu, 1964 cited in Akbaş, 2008). Thus, it can be expected that the students would also feel happy. Accordingly, the students were able put themselves in the shoes of another person with regard to the empathetic dimension.

In the study, the students were asked to create a poster about respecting differences. They addressed friendship, happiness, helpfulness, teasing, peace and equality in their posters. The finding that they mostly featured the value of friendship can be related to their social development. Moreover, the students explained respecting differences in their posters mostly with positive situations. In Öksüz et al. (2015), students similarly included categories reflecting positive attitudes in their drawings about respecting differences. In the present study, peace was the value included the least in the students' posters. In fact, peace involves respecting differences, tolerance, helpfulness, friendship, love and solidarity (Çoşkun & Keskin-Keskin, 2009; Cengelci-Kose & Gurdogan Bayir, 2016). It can then be argued that the students perceived respecting differences in the context of friendship and made less reference to other universal values such as peace, equality and justice while explaining it.

As a result, the students responded to the moral, intellectual and empathetic questions related to the sample case by reflecting the characteristics of their developmental period. In the intellectual dimension, they highlighted physical characteristics for the value of respecting differences but did not mention differences in feelings and views However, putting into consideration such differences in ensuring social peace would enable conflicts to be solved peacefully. Besides, considering that respecting differences is important in all societies, it would be beneficial to deepen students' perspectives. In this respect, sources such as current issues, sample cases and problems can be used in the instructional process to develop multiple perspectives regarding this value. This is because these sources would enable students to become more sensitive to social issues. Additionally, issues that focus on differences in feelings and views can be covered in classes. In the literature, the research on respecting differences is mostly quantitative, and thus in-depth qualitative studies can be conducted to examine this value. Longitudinal studies can also be carried out to observe students' long-term development.

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The Usage of Meaning Identification Technique in Measuring Reading Comprehension Skills*

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Abstract

In this study, it is aimed to determine at what level the Meaning Identification Technique (MIT) can measure the reading comprehension skills of the 4th grade primary school students and to test the validity and reliability of the MIT test with different types of texts. In the study carried out in the survey model, MIT and Sentence Verification Technique (SVT) tests, which were developed by the researcher and are peculiar to narrative and informative texts, were used. The readability of the texts was tested with Cloze Tests (CT) developed specifically for each type of text. The study was carried out with the participation of 87 primary school 4th grade students in two primary schools randomly selected among the public schools in the city of Ankara. The results of the study demonstrated that MIT tests measure reading comprehension skills as reliable as SVT tests. While there was a significant difference between comprehension and the numbers of reading in narrative texts, it was found that there was no significant difference with the numbers of reading in informative texts. A great majority of students (approximately 75%) felt the need to read two or more times while making sense of the text. On the other hand, MIT tests are a significant predictor of Turkish course achievements.

Keywords: Reading Comprehension, Sentence Verification Technique, Meaning Identification Technique, Cloze Test

Introduction

The assessment of reading comprehension skills has been one of the important milestones in the field of education for over 100 years. According to Marcotte, Rick and Wells (2018), reading comprehension skills play an important role in course achievements. It is particularly of importance for researchers, teachers, and material developers to have correct and purposeful measurements for reading comprehension skills.

Several assessment tools were developed for the identification and handling of reading comprehension skills (reading comprehension tests, cloze tests, sentence verification tests etc.). At the international level, literacy skills are determined by standardized tests through the Programme for International Student Assessment (PISA). These exams are composed of different types of questions and the majority of these questions are created with multiple choice questions. It is rather difficult for individuals who want to determine their reading comprehension skills to access, prepare, and evaluate PISA questions in this way (OECD, 2016). Despite the development of many assessment tools, it is seen that there are no reading evaluation tests standardized according to class level and available to be used at the national level in Turkey (Ulusoy & Çetinkaya, 2012).

Research and Development (RAND) Reading Study Group (2002) is designed for a good reading comprehension test. This study group was created for different text types to provide descriptive information on readers. It is also structured for different age ranges, to measure more than one of the components of comprehension altogether based on a theoretical structure and to be sensitive to social, cultural, and linguistic differences (Snow, 2002). Caccamise et al. (2008) emphasize that formative assessment in the classroom environment provides better results in determining students' competencies in a field. In this view, improving reading comprehension tests may change depending on many factors. the purpose of this study was to focus on the adaption of Meaning Identification Technique (MIT) tests with a particular attention to the Turkish language features rather than the standardization of the text.

The reading comprehension tests that are called traditional show only how the text can be better understood. These tests do not address how the cognitive and meta-cognitive processes are used, or where the challenges are faced in the process of interpretation (Klingner, 2004). On the contrary, the Sentence Verification Technique (SVT), which is developed by using texts, can identify both reading and listening comprehension skills. SVT is created for different purposes and to demonstrate what kind of mistakes have been made in the process of understanding. SVT was influenced by the idea that understanding is a structural process. SVT is based on the theory that the meaning is an image that is formed in our minds as a result of the interaction of the reader's prior knowledge with the information received from the text (Kintsch, 1994; Kintsch & Kintsch, 2005; Kintsch & Van Dijk, 1978; Royer & Cunningham, 1981; Royer et al.,1979). The researchers emphasize that the processing memory, the discernment of the text's structure, and the prior knowledge and scheme of the reader are influential in the process of reading and listening comprehension. This theory asserts that reading or listening comprehension can be measured by mental representations formed in the minds after reading or listening texts.

In the preparation of the SVT test (Royer, 2001; Royer et al. 1987), the texts are rearranged in a way that each consists of 12 sentences. Each sentence in the text is then rewritten in accordance with four types of sentences: "original, paraphrase, meaning change, and distractors." The original sentences are written exactly the same way written as in the text. On the other hand, in paraphrases, at least a few words should be changed from the sentence in the text, but the

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meaning should remain the same. In sentences that their meanings were changed, the meaning should be changed by replacing only one or two words from the sentence in the text. The new sentence and the sentence structure in the text should be rather similar to each other. As for the distractors, by sticking to the syntactic features and the main theme of the text, sentences are formed with a completely different meaning. By writing 4 sentences from each sentence type, a new text with 16 sentences is obtained.

The literature illustrates that the SVT tests is a useful technique for measuring reading comprehension in English language text. SVT tests are often used in measuring reading comprehension skills (Durwin & Sherman, 2008; Lastrapes, 2015; Marcotte & Hintze, 2009; McKeown et al., 2009; Pichette et al., 2014), in measuring listening comprehension skills (Greene et al., 1990; Kertoy & Goetz, 1995; Lehto & Anttila, 2003) in defining reading problems (Carlisle, 1989; Carlisle, 1999; Royer & Sinatra, 1994), as a descriptive study in determining students' reading levels (İlter, 2017; Royer et al., 1990), in measuring the language skills of students of English as a second language (Mestre & Royer, 1991; Royer & Carlo, 1991; Royer et al., 1991), in determining the levels of texts (Jones & Smith, 2014; Yazıcı & Kurudayıoğlu, 2017) and in predicting learning skills (Mooney et al., 2016; Mooney & Lastrapes, 2018; Royer et al. 1987; Royer et al., 1990).

The MIT is applied differently form the SVT. The purpose of the MIT is to eliminate the features that can reduce test reliability while evaluating the meaning of the text. The MIT tests can be applied to both narrative and informative texts. The texts selected for the MIT should have only following sections: problem, event, and conclusion. The MIT is based on the idea that the meaning is structurally constructed. Tests constructed for this technique consist of two types of questions which are “meaning change” and “paraphrase types. (Marchant et al., 1988). The MIT consists of 12 sentences which is written as 6 items from each of the two sentence types. Practitioners who respond to this test are expected to answer the questions by considering and evaluating their meaning in the text. Indeed et al. (1995) itemize the characteristics of good readers as interacting with the text through their experience to understand the text, text interpretation, synthesis, and evaluation. In this context, Yıldırım et al. (2010) alleged that the narrative texts are easier to understand with compared to informative texts. The fact that the informative texts are more difficult to understand, the following factors have effect on texts: the lack of sufficient knowledge on the text content and structure (Armbruster et al. 1987; Diakidoy et al., 2005; Kamberelis & Bovino, 1999), less interaction with the texts (Singer et al., 1997), and the need for prior knowledge and vocabulary (Afflerbach, 1986; Best et al., 2008; McNamara et al., 2011).

The studies on the SVT and the MIT reveal that there are a limited number of studies on the MIT tests (Marchant et al., 1988; Ushiro et al., 2013). although there are many studies claiming that the SVT tests can be used as valid and reliable tools (Lynch, 1982; Marchant et al., 1988; Marcotte et al., 2018; Royer et al., 1979; Royer et al., 1984), These studies, on the other hand, assert that the MIT can be used as a reliable tool for measuring both superficial and inferential comprehension (KR-20=.77). However, it is safe to say that previous studies on this subject did not consider and implement the MIT test in reading comprehension in Turkish language text. Hence, further investigations are required to determine students’ level of reading comprehension in Turkish texts.

Reading comprehension tests are accepted as important indicators of both reading comprehension and learning performance. These tests are used as important tools in determining student achievement (Royer et al., 1990). Royer et al. (1990) found that SVT tests explained 36% of the variance affecting school success whereas they explained 30% of the course achievement. The purpose of their study is to determine to what extend the Meaning Identification Technique (MIT) can measure the comprehension skills of the 4th grade primary school students in reading narrative and informative texts as well as testing the validity and reliability of the MIT test in different text types. In addition to that, the readability of the texts is determined by Cloze Tests. study aims to revive interest in measuring reading comprehension in Turkish by implementing the MIT tests.

The research questions of the study are as follows:

1. What are the students’ reading scores from the MIT tests?

2. Whether and to what extend the students’ reading scores from the MIT tests associated their genders?

3. Whether and to what extend the students' reading scores from the MIT tests are associated with their numbers of reading the text?

4. Whether and to what extend the SVT tests and the MIT tests are associated with Turkish course achievements?

5. To what extent does the students' SVT and MIT scores affect their Turkish course achievements?

Method

Survey model is the main method adopted by this study. a survey was constructed to see to what extent the MIT is able to measure students' reading comprehension skills. It also analyses the validity and reliability of the MIT test in different text types. The study followed the process figured below.

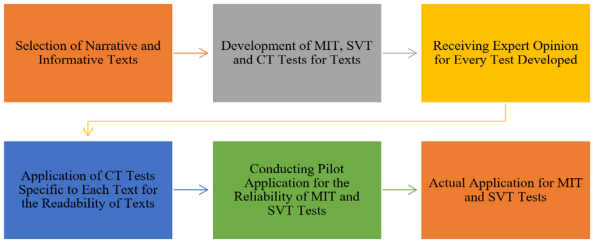

Figure 1. Data collection procedure

Subjects for the Study

The unit of analysis of the study was fourth graders. The participants of the study were

87 fourth grade students from 3 different classes of the public schools in Ankara, the capital city of Turkey. The data was collected between February 26th and Februay 28th in 2018. Participants have similar socioeconomic backgrounds and their ages vary between 9 and 10 years with a 9.86 mean age. Students were identified with convenience sampling method. This type of sample is conducted with people who are willing to participate in the study (Johnson & Christensen, 2004) and who can easily participate in the study (Patton, 2002). The consent form—which explained that the participation of respondents is on a voluntary base—was placed at the beginning of the survey. Consent form to participate in this study was obtained from school administration and class teachers ensured the students’ participation. Detailed information on the purpose of the research was given to administration, class teachers, and student to assure the confidentiality and that no personal identifiable information was collected. The descriptive analysis of the study depicts that 57.5% of the participants was female while 42.5% of them was male.

Data Collection Tools

Three copyrighted tests, consisting of 53 items were used to construct a survey questionnaire. These scales are SVT, MIT, and CT tests.

SVT and MIT Tests. SVT and MIT tests, which are peculiar to narrative and informative texts, were adopted as the data collection tool. In the determination of the narrative and informative texts, primary school 4th grade Turkish textbooks published by the Ministry of National Education (MNE) were examined and the text of "Fairy Tales to Eat" was selected as a narrative (N) and the text of "A Tiny Box: The Seed" was selected as an informative text (I) from the textbook. The following procedure, which was determined by Royer et al. (1987), was used to form SVT-MIT tests:

1. The narrative and informative texts were rearranged in a way that each consists of 12 sentences.

2. For the SVT tests, a total of 16 sentences were written, composed of 4 sentences from each of the original, meaning change, paraphrase, and distractor types.

3. For the MIT tests, a total of 12 sentences were written, composed of 6 sentences from each of meaning change, and paraphrase types.

4. 'Yes' and 'No' options were added to each sentence, and students were asked to compare the real meaning of what they read and the meanings of the sentences in the SVT and MIT tests.

5. The answer 'Yes' means that the meanings in the sentence and in the text are the same while the answer 'No' means that the meaning in the sentence and meaning in the text are different from each other.

6. The texts used in the study and the SVT and MIT were prepared in a way to be on separate pages.

7. The sentences in the first half of the text were the first questions in the SVT and MIT tests. In this way, it was aimed to prevent students from answering test questions with short-term memory.

8. In the interpretation of the scores obtained from the SVT and MIT tests, 70% and below scores were evaluated as frustrating comprehension level, the scores between 71% and 79% were considered as the instructional level of comprehension, and the scores 80% and above were assessed as independent level Figure 2 below depicts some examples of developed test items.

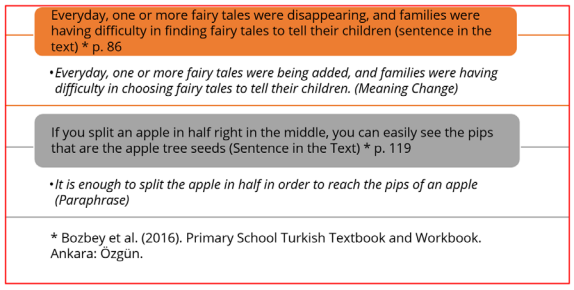

Figure 2. Examples to the MIT test items

Cloze Tests. Narrative texts and informative texts consisting of 136 and 188 words were used in this study. In order to determine the readability of the texts that are used in the SVT and MIT tests, Cloze Tests (CT) were prepared, the sixth word of which was deleted. CT was developed by Taylor (1953) to determine readability. This test is also used as a valid and reliable tool in determining the readability of the Turkish texts (Keskin & Akıllı, 2013; Tunçer & Erden, 2015; Ulusoy, 2009). The first and the last sentences of the texts are provided as a hint, when the test was being prepared. From the second sentence, every sixth word has been deleted. Four answer options were added to each gap, three of which were distractors while one was the correct answer. 33 students were employed to use CT tool. Students were asked to mark the correct answer and select one of the appropriate options for the deleted word. The application was completed in a 40-minute. Table 1 provided the readability scores of the texts.

Table 1. *Readability values of texts*

Type of Text	Percentage of Readability	Assessment Criteria
Fairy Tales to Eat (H)	*59.37%*	60% and above Independent reading level – Easy text 40% - 59% Instructional Level Below 40% Frustrational level- Difficult Text (Rankin & Culhane, 1969).
A Tiny Box: The Seed (B)	*47.26%*	
N: Narrative text, I:Informative Text		

Table 1 show that both narrative and informative texts are at instructional level. After determining that the texts were appropriate for the students' levels, the opinions of two subject-matter expert faculty members were consulted for the scope validity of the SVT and MIT. For the reliability of the tests, a pilot study was conducted with 26 students studying in a public school in Ankara. Table 2 depicts the KR-20 values to determine the reliability of the tests.

Table 2. *Results of the texts' reliability analysis*

	KR-20 Values		
Type of Text	SVT	MIT	Assessment Criteria
Fairy Tales to Eat	.74	.72	> .70 (Fraenkel & Wallen, 2006).
A Tiny Box: The Seed	.73	.78	

Table 2 reveals that both SVT and MIT tests can give reliable results and they can be used in the actual application.

Turkish Course Success. In the determination of the students' success in the Turkish language course, Turkish course exams conducted by teachers were taken into consideration. Turkish course achievement scores were determined by calculating the average of students' scores for two exams.

Process

Prior to the actual application, students were informed about the SVT and MIT tests and were asked whether they are familiar with the test. Firstly, the papers with 12-sentence narrative text (Fairy Tales to Eat) were distributed to the students and they were allowed to read until they understand. No time limitation was applied for students so they can focus on understanding the text. Students noted number of readings on upper right corner of the paper. After that, the papers of the MIT and SVT tests were distributed to the students and they were asked to answer the test. The same procedure was repeated for the informative text as well (A Tiny Box: The Seed). The students were asked to answer four different tests in a total of 60 minutes.

Data Analysis

The data obtained as a result of the research was firstly transferred to the computer environment and was examined in terms of missing or incorrect value, outlier, and multivariate. 4 of the 91 observations in the data set were excluded because they were outliers. Thus, data obtained from 87 students were included in the study. Kolmogorov-Smirnov and Shapiro-Wilk Tests were conducted to see whether the data has normal distribution or not. The test results provided us that the data had normal distribution ($p \geq .05$, see Table 3). Students' levels of reading were determined by calculating the percentage, frequency, and means of the scores obtained from the SVT and MIT tests. In the tests, it was concluded that the data was distributed normally. Independent t-test was implemented to determine whether and to what extend the narrative and informative reading texts and the reading scores of the male and female students are associated. One-Way Analysis of Variance was conducted to determine the difference by the reading numbers. For assumptions (homogeneity of variance) of underlying one-way Anova test was used Informative MIT ($F_{(2,84)}$= .179; p= .836). Narrative MIT ($F_{(2,84)}$= 5.09; p= .008, for normality you also see Table 3) correlation analysis was utilized to test the relationships and the regression analysis was used for the prediction of Turkish course comprehension success.

Table 3. *Normality Tests of Variables*

	Variables	Skewness	Kurtosis	Kolmogorov-Smirnov	Shapiro-Wilks
N-MIT	Male	-.769	-.141	.001	***
	Female	-.831	.855	.000	***
N-NR	One	-.408	-.764	***	.63
	Two	-.608	-.107	***	.11
	Three and more	-.293	-.445	***	.38
I-MIT	Male	-.673	.013	.007	***
	Female	-.304	-.720	.009	***
I-NR	One	-.593	-.529	***	.024
	Two	-.341	-.508	***	.087
	Three and more	-.112	-1.342	***	.23

N-MIT: Narrative meaning identification test, N-NR: Narrative text number of reading, I-MIT: Informational Meaning Identification Test I-NR: Informative text number of reading, Accaptable Range: +1 <kurtosis and skewness <-1, Tabachnick, Fidell & Osterlind (2013)

Findings

The research findings were provided in order by taking into account of the research questions.

What are the students' reading scores from the MIT tests?

Table 4 and Table 5 indicate he values obtained by analyzing students' reading scores from the MIT tests.

Table 4. *Percentages, means, and standard deviations regarding students' reading scores*

Texts	Reading Scores			
	n	%	*M*	*SD*
Fairy Tales to Eat	87	73.46	8.81	14.62
A Tiny Box: The Seed	87	62.16	7.45	15.18

The results provided us that the students got higher scores from the narrative texts. In the light of the results, the students could be grouped as the ones who have weak (62%) comprehension skills from informative texts and those who have instructional comprehension skills (73%) from narrative texts, in accordance with Royer's (2001) SVT test evaluation criteria.

Table 5. *Distribution of students' MIT reading scores by good, average, and poor understanding levels*

Texts	Reading Scores							
	Good		Average		Poor		Total	
	f	%	*f*	%	*f*	%	*f*	%
Fairy Tales to Eat (H)	35	40.2	22	25,3	30	34.5	87	100
A Tiny Box: The Seed (B)	10	11.5	21	24.1	56	64.4	87	100

Table 5 reveals that the highest scores on the narrative text type are at the level of good understanding (f= 35) and the weak understanding seems to be the highest on the informative text type (f= 56).

Whether and to what extend the students' reading scores from the MIT tests associated with their genders?

In order to see whether and to what extend the students' reading scores from the MIT tests associated their genders, an independent *t*-test were conducted. Table 6 below depicts the results.

Table 6. *Independent t-test results regarding MIT tests of male and female students*

Text Type	Female			Male					
	n	*M*	*SD*	*n*	*M*	*SD*	*df*	*t*	*p*
Fairy Tales to Eat (H)	50	75.83	14.21	37	70.26	14.76	85	1,28	.202
A Tiny Box: The Seed (B)	50	62.16	16.16	37	62.15	13.97	85	.001	.999

It is seen that the MIT scores of the students are not significantly associated with their genders. The results provided that the average scores of male and female students are very close to each other.

Whether and to what extend the students' reading scores from the MIT tests are associated with their numbers of reading the text?

Levene F test results depict that variances are homogeneous ($F_{(2,84)}$= 5.09; p= .008). For this reason, LSD from post hoc tests were conducted to evaluate differences among the means. A one-way analysis of variance is implemented to check whether there is a significant difference between the students' numbers of reading and reading comprehension skills. Tables 7, 8, 9, and 10 reveal the results.

Table 7. *Descriptive statistics of narrative text MIT test scores*

Number of Reading	*n*	*M*	*SD*
One	24	66.66	18.22
Two	42	75.99	13.04
Three and more	21	76.19	10.63

Table 8. *One-way Anova results for reading scores of narrative MIT test by the number of reading*

Source of variance	Sum of squares	*df*	Mean square	*F*	*p*	Difference
Between groups	1533.12	2	766.56	3.82	.026	2-1, 3-1
Within group	16873.42	84	200.87			
Total	18406.53	86				

*p< .05

Table 8 indicates that there is a significant difference between the number of reading and reading comprehension of narrative texts ($F_{(2-84)}$= 3.82; p< .05). It is seen that this difference occurred in the Lsd multiple comparison test in favor of the students who read the text three times (M= 76.19) and twice (M= 75.99). The percentage of the students who

stated that they read the narrative text at least twice to make sense of the text is 72%.

Table 9. *Descriptive statistics of informative text MIT test scores*

Number of Reading	*n*	*M*	*SD*
One	27	58.64	16.58
Two	37	65.08	14.68
Three and more	23	61.59	13.93

Table 10. *One-way Anova results for the reading scores of informative MIT test with respect to the number of reading*

Source of variance	Sum of squares	*df*	Mean square	*F*	*p*
Between groups	659.04	2	329.52	1.44	.242
Within group	19175.1	84	228.27		
Total	19834.15	86			

Levene F test scores show that variances are not homogeneous ($F_{(2,84)}$= 5.09; p= .836). Table 10 shows that there is no difference in reading comprehension scores obtained from the MIT test by the numbers of reading the text ($F_{(2,84)}$= 1.44). In other words, further reading of the text does not indicate that better understanding will occur. The results illustrate that the students who read the text twice reached higher means (M= 65.08) than the other students. The percentage of the students who stated that they should read the text at least twice is 69%, while the percentage of the students who stated that they should read at least three times in order to make sense of it is 26%.

Whether and to what extend the SVT tests and MIT tests are associated with Turkish course achievements?

Assumption of underlying the significance tested and variables are normally (bivariately) distributed (see Table 3). Table 11 provided the means and standard deviation values of the study variables and the correlation coefficients between these variables.

Table 11. *Correlation analysis results to determine the relationship between variables*

Variables	M	SD	1	2	3	4	5
1.Turkish Course Achievement	86.25	9.75	1.00	.41**	.26*	.36**	.43**
2. Narrative MIT	73.46	14.63		1.00	.13	.51**	.35**
3. Informative MIT	62.16	15.19			1.00	.13	.54**
4. Narrative SVT	81.32	13.36				1.00	.21
5. Informative SVT	68.90	14.54					1.00

** p< .01; * p< .05

The figures provided by Table 11 reveals that the students became more successful with the tests prepared with narrative texts. The students obtained a higher mean score from the SVT tests (M_{NSVT}= 81.32, M_{ISVT}= 68.9). The correlation coefficients values between the variables indicated that there is a moderate and positive correlation between the students' Turkish course achievements and I-SVT (r= .43, p< .01) and N-MIT (r= .41, p< .01), whereas a positive and low-level correlation was found with N-SVT (r= .36, p< .01) and I-MIT (r= .26, p< .05). Accordingly, the more students' SVT and MIT scores increase, the more Turkish course achievements increase. In addition, there are positive, average-level correlations between SVT and MIT tests prepared with informative texts (r= .54, p< .01), as well as between SVT and MIT (r= .51, p< .01) tests prepared with narrative texts. In other words, as the students' scores from the SVT tests prepared with both narrative and informative texts increase, their MIT scores also increase.

To what extent does the students' SVT and MIT scores affect their Turkish course achievements?

Table 12 and Table 13 postulate the results of multiple linear regression analysis for predicting Turkish course achievements. Assumptions of underlying significance test of multiple linear regression tested (MIT-VIF= 1.018, SVT-VIF= 1.047, MIT-Tolerance= .983, SVT Tolerance= .955, Condition Index (CI)= < 30) and Tolerance values approaching to zero, VIF greater than 10 and CI above 30 was not found.

Table 12. *Multiple linear regression results of MIT scores' prediction of Turkish course achievements*

Variable	*B*	SE	β	*t*	*p*
Invariant	59.05	5.83		10.13	.000
Narrative MIT	.26	.065	.39	3.95	.000
Informative MIT	.13	.063	.21	2.13	.035

R= .46; R^2= .21; Adjusted R^2= .195; $F_{(2-84)}$= 11.4; p< .05
VIF:1.018, Tolerance: .983, CI<30

The multiple regression analysis reveals that there is a positive, moderate, and significant relationship between the MIT scores and Turkish course achievements (R= .46, R^2= .21, Adjusted R^2= .195, p< .05). The narrative MIT (β= .26, p< .05) test and the informative MIT (β= .13, p< .05) test are positive significant predictors of the Turkish course achievements. Moreover, the findings postulated that approximately 21% of total variance of Turkish course achievements are explained by the MIT scores.

Table 13. *Multiple linear regression results of SVT scores' prediction of Turkish course achievements*

Variable	*B*	SE	β	*t*	*p*
Invariant	52.26	6.72		7.78	.000
Narrative SVT	.21	.072	.28	2.85	.005
Informative SVT	.25	.067	.37	3.75	.000

R= .51; R^2= .26; Adjusted R^2= .241; $F_{(2-80)}$= 14.02; p< .05
VIF:1.047, Tolerance: .955, CI<30

The results of the multiple regression analysis reveal that there is a positive, moderate, and significant relationship between SVT scores and Turkish course achievements (R= .51, R^2= .26, Adjusted R^2= .241, p< .05). Hence, it is safe to say that informative SVT (β= .25, p< .05) tests and narrative SVT (β= .21, p< .05) tests are positive significant predictors of Turkish course achievements. Moreover, the findings of the study indicate that SVT scores explain approximately 26% of the total variance of Turkish course achievements.

Conclusion and Discussion

The results of the study provided us that the MIT test is a reliable tool (*KR-20*= .72; .78) to measure reading comprehension skills. The results of the cloze tests (%59.37 - %47.26) revealed that both types of texts were instructional (not above or below the children's level). In the study, it was found that poor comprehension (62%) occurred with informative texts and average-level comprehension (73%) was reached with narrative texts. These results of the study are consistent with the studies revealing that narrative texts are more easily understood than informative texts (Best et al., 2008; Rasool & Royer, 2001; Şahin, 2013; Yıldırım et al., 2010).

The findings of the study show that comprehension skills in reading narrative and informative texts did not differ

significantly by their gender. The reading tests results reveal that the students' scores were very close to each other. On the other hand, some studies (Çiftçi & Temizyürek, 2008; Rasool & Royer, 2001; Şahin, 2013; Yıldırım et al., 2010) reveal significant differences in favor of female students. Considering that these two text types are also at instructional level, this situation can be explained by the facts that all students use similar strategies in the process of understanding (see Pressley & Afflerbach, 1995) and that they were allowed to read until they understand during the study process. These studies obtained similar findings. For instance, Şahin (2013) studied fourth and fifth graders and found no significance difference between the informative texts reading comprehension marks of fifth grade male and female students. The study of Çiftçi & Temizyürek (2008) reveal that there isn't a significant difference between reading comprehension levels with regards to male and female students. Students performed similar understandings in 56% of total learning outcome.

When comprehension skills were compared in relation to the numbers of reading the text, a significant difference was only found between comprehension of narrative texts and the numbers of reading. The findings of the study indicate that students who read the text more than once received higher scores than the students who read only once. On the other hand, 72% of the students mentioned that they read the narrative text at least twice to make sense of it. The results show that 69% of the students read the text at least two times and 26% of them read at least three times in order to make sense of it. According to Royer et al. (1984), the SVT is sensitive to the degree and level of difficulty of the text read when determining reading comprehension. In the study of Best et al. (2008), they concluded that word recognition is important in making sense of narrative texts whereas vocabulary and prior knowledge on the subject are significant in informative texts. . The data at hand provides us the fact that students felt the need to read the text more than once, although the texts were at instructional level could be explained with the factors such as being unfamiliar with MIT tests, the lack of prior knowledge about the subject and also the lack of detailed information about the text structures.

The findings of the study revealed that there was a positive significant relationship between the students' Turkish course achievements and the MIT and SVT tests. In addition, the results postulated that there are positive, moderate-level ($r=.51$, $p< .01$) and significant relationships between MIT and SVT ($r= .54$, $p< .01$), and between MIT and SVT tests. In other words, students' SVT test scores increase as their scores obtained from MIT tests prepared with both narrative and informative texts increase. On the other hand, both MIT and SVT are significant predictors of Turkish course achievements. The MIT tests accounted for 21% of the variance affecting Turkish course achievements while SVT tests explained 26% of them. These results show similarities with many studies in the literature (Mooney et al., 2016; Marchant et al.,1988; Royer et al., 1990). The study reached the conclusion that the variance of the MIT tests that affected the course achievements was in varying rates (7% - 30%).

Limitations and Future Directions

This study was designed to test whether the MIT test is a valid and reliable tool to measure comprehension skills in reading different text types. However, as in all studies, there are some limitations also in this study that need to be addressed in future researches. First of all, the sample of this study consisted of 4th grade students studying at a primary school of a neighborhood considered to be at middle-level in socio-economic terms. Therefore, the results of the current research may not reflect the general condition of the 4th grade students. Future researches should be repeated in a way to include a larger sample, covering different socio-economic levels. In this way, the reorganization of MIT test's evaluation and assessment criteria peculiar to students in Turkey might be ensured.

Secondly, assessments were made over the given correct answers in the developed MIT and SVT test scores. Kintsch & Kintsch (2005) emphasize that comprehension requires inference and inference requires knowledge. Researchers indicate that reading comprehension skills will become more understandable by determining how the information is used in the reading process. In this context, by reviewing the answers given to MIT and SVT test items, the mistakes made by the students in the process of understanding can be revealed. In other words, it can be determined on which sentence type (original, meaning change, paraphrase, distractor) the students were more successful/unsuccessful.
In conclusion, it is easy to prepare, apply and evaluate the MIT tests in different text types; it is thought that the MIT test can high availability be used in our schools. There is a need for the future researches to check its usability on other courses at primary schools and for different education levels as well as to measure students' listening comprehension skills.

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The Relation Between Social Learning and Visual Culture*

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Abstract

With the developing technology, acceleration of visual production and increasing of peoples' relation with generated visuals (painting, photograph, video, computer games, poster, etc.), is a situation which affect perceptual and behavioral characteristic of people. As a result of connection with generated visuals, changes at the perception and behavior of people remind social learning and visual culture terms which have relation with seeing and visuality fields. Relation between the social learning theory, which states that learning occurs through observation in social environment, and visual culture subject is a mystery. Due to this reason, the research aims to investigate relation between social learning and visual culture. Theoretical structures of the social learning and visual culture terms were pointed out in this research, and relation between these two terms were argued at theoretic level. In consequence of this research, it was seen that experiences, people obtain from connection with visual culture forms in their daily life, and social learning have connections. It was realized that visual culture forms supply vicarious livings to the observers prone to observe and imitate of behaviors that have model characteristic. It was seen that the livings, acquired observational learning from visual culture forms, is a shaping factor for individuals' attitudes and actions. In the study, it was seen that examining the visual culture as an environmental factor in the context of social learning will help to understand and illuminate the changing, transforming and deriving aspects of human behavior in the 21st century.

Keywords: Social Learning, Visual Culture, Observational Learning

Introduction

We observe that visual forms (pictures, photos, videos, animations, computer games, movies, posters etc.) that we perceive through observation are rapidly produced, understood and consumed in the present century. The visuals, which have become an integral part of the 21st century socio-cultural life, are all around life as an environmental factor. Mobile phones, billboards, television screens, computers, buildings, public transport stations etc., and individual and collective living spaces are surrounded by visuals. In our social life under the hegemony of visuals, our communication with the visuals is sometimes ensured by our individual choices, sometimes by non-preferential communication. Regardless of the type of communication with visuals, it is thought that visuals present various meanings to the observers in the sensory or behavioral context. This situation brings up the issues of learning through visual arts, visual learning and social learning.

Social learning is related to the experiences we get from others or from the environment through observation. The emphasis of the social learning on the environmental factor is discussed in the context of the visual forms produced by humans. Learning by observing helps to achieve faster results and more satisfactory experiences than learning by reading or listening. Therefore, in the era of visual culture, the pace and direction of learning through visuals has improved. Especially the opportunities offered by internet technology, learning and observing from the visuals, makes the subject of learning valuable and important. For this reason, as an environmental factor in the research, the relationships between the experiences we have acquired from the visual forms and our behaviors were examined in the context of social learning and visual culture.

Social Learning

Social learning theory is a learning theory positioned between behavioral learning and cognitive learning. It is known that the foundations of social learning, which is one of the cognitive-weighted behavioral learning theories, are quite old. It is possible to see the traces of social learning in the views of Plato and Aristotle, two of the famous philosophers of antiquity, on education. Plato's Cave Allegory emphasizes the actions of observation and modeling. Also, in Aristotle's famous work The Politics, it is seen that the action of sight and environmental factors have an impact on learning (Aristoteles, trans. 2010). In this study, Aristotle expressed the need of keeping children (5-7 year olds) away from the slaves as much as possible, since the young children tend to learn many things in observational and auditory way (Aristoteles, trans. 2010, p. 230). Because, according to Aristotle, observing the environment has important roles on behavior acquisition. In similar way, it is possible to see the traces of social learning in the views of the philosopher and educator John Dewey on education. According to Dewey, the relationship between people and each other is an important element in learning. Because Dewey (2004) believes that communication has an educational force on individuals in social life. It is seen that Dewey's view of the school as an integrated unit with social life, and the views of the individual on living and learning through social life are related to social learning. Also, Russian psychologist Lev Semenovich Vygotsky is one of the names that draws attention to the phenomenon of social learning. According to Vygotsky (1978), the role of the social environment on human learning cannot be ignored. Therefore, "Vygotsky gives a central role to the culture and transfer of culture through social interaction and communication while explaining the development of psychological functions" (Özbay, 2011, p. 145). Vygotsky's views of the individual on

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social learning from the social environment and importance on the role of the social environment in cognitive development are related to the issue of social learning. As it is stated in all these examples, it is known that the effects of human relationships with the environment as a social being on the learning subject have been handled by different theorists in different periods.

Observation and observation processes in social learning have a basic and preliminary position. Because observation represents the first step of interpersonal relations in social life. Berger in his study (1977) states it as "seeing comes before words. The child looks and recognizes before it can speak" (p. 7). In this context, the primary role of human vision in the relationship with the social environment makes observation an essential element of social learning. The basic and preliminary role of observation in the interpersonal relations plays an important role on associating social learning theory with learning by observation phenomenon. Researchers such as Edward Lee Thorndike, John Broaud Watson, John Dollard, Neal Miller and Burrhus Frederic Skinner, who try to explain learning through observation, appear to essentially contribute to the maturation of social learning theory.

Psychologist Edward L. Thorndike is the first person to try to explain the learning through observation. Thorndike (1911) tried to explain learning by observation through experiments with animals such as cats in particular, chicks, monkeys and dogs. In the experiment, it was examined that, whether inexperienced animals would succeed in achieving out-of-box behaviors by watching experienced animals that had previously learned to come out of the puzzle box. As a result of the examination, inexperienced animals were not able to get out of the puzzle box by observing experienced animals getting out of the puzzle box. For this reason, Thorndike could not obtain any significant findings from his observational learning based experiment. Thorndike, who used monkeys in his experiment like Watson did, appears to be unable to obtain observational learning based findings (Kalkan, 2011, p. 246). Unlike Thorndike and Watson, Neal Miller and John Dollard appear to emphasize the role of reinforcer in imitating behavior and do not deny learning through observation (Senemoğlu, 2012, p. 215). According to Miller and Dollard (1979), reinforcer as a result of imitated behavior is an important element in repetition of behavior. Similar to Miller and Dollard, Burrhus Frederic Skinner observes that the observer imitates the model, makes his behavior similar to the behavior of the model, and ultimately reinforces the behavior similar to the behavior of the model. (Kalkan, 2011; Senemoğlu, 2012). All these examples that contribute to the development of social learning theory reveal roles of eyesight on learning. However, it is known that the major contribution to observational learning is given by Albert Bandura.

Albert Bandura and Observational Learning

Social learning theory is identified with the famous Psychologist Albert Bandura. Albert Bandura developed the theory of social learning during his study period at Lowa University. With many studies on social learning, Bandura's most important studies are 'Bobo Doll' experiment in 1963 and his book 'Social Learning Theory' published in 1977. Bandura states that, social behavior in relation to human behavior; cognitive, behavioral and environmental factors should be discussed in the context of the interaction (Bandura, 1977). Therefore, Bandura's views on social learning differ from those contributing to this subject. Especially Bandura draws attention to the role of 'observational learning' on social learning; observing an individual's behavior is not simply imitating it. Bandura approaches social learning in the context of both observation and cognitive factors. As it is understood from his views, the individual imitates a behavior that he observes from the social environment with cognitive evaluation. Therefore, the relations between personal, behavioral and environmental factors appear in Bandura's social learning theory as follows (Bandura, 1977, 1997):

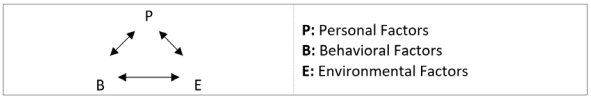

Figure 1. Relation between personal, behavioral and environmental factors according to Bandur

It is known that Albert Bandura tried to prove observational learning through the 'Bobo Doll' experiment in 1963. This experiment with the help of a toy called Bobo Doll was carried out with the participation of a group of children and a model. Basically, in the experiment the behaviors of the model playing with Bobo Doll were shown to a group of children. In the shown scene, the model hits the Bobo Doll toy with a hammer, throws it into the air, kicks it and throws it on the ground. Children participating in the experiment observed the aggressive behavior of the model on the toy. Afterwards, the children were taken to a laboratory full of toys. In this laboratory, where the Bobo Doll is; it was seen that the children played with Bobo Doll with the exact behavior of the model. It has been observed that the behaviors of the model such as; hammering, tossing, kicking and throwing on ground and beating / pounding etc., were similarly imitated by the children. Children's use of aggressive language while playing with Bobo Doll is another interesting subject. Albert Bandura presented important data on observational learning through this experiment.

Based on Albert Bandura's studies on observational learning, it is possible to comment on the visual culture which we face and feel in the present century's daily life. If we consider visual culture as an environmental factor, it does not seem possible for individuals to not observe this culture or to not reflect the traces of this culture on their behaviors in some way. It is observed that the famous characters observed in the visual culture such as; cinema, series, cartoons, fashion, social media etc., fields exhibit similar behaviors to the behavior of the model playing with the Bobo Doll toy in Bandura's experiment. It is thought that it is possible to explain the observed behaviors and the reflections on the behaviors of the observers through social learning. For this reason, the subject of social learning is discussed in this study in focus of our communication with visual culture, which is a social phenomenon. Before going into these discussions, it is considered necessary to determine the state of the subject of visual culture and how the visual culture is handled from this perspective.

Visual Culture

Visual culture is a multidisciplinary term that points to the increase of the visual forms with technological development in daily life such as; photography, painting, animation, graphic design, video etc. Although the history of visual communication with the produced images of human beings is based on the ancient times (Paleolithic Age), the term visual culture refers to the period after 1950's-1960's. In the postmodern world after 1950's-1960's, the relations of the individual with the visuals become more widespread through technology. The visual forms that surround socio-cultural life are in constant interaction and communication with people. Today, these forms can be encountered in many different topics, content and areas, such as; in a form of a weekend discount of a market, presentation of a film, exhibition or concert, representation of a fashion of the period, visual designs that address a social issue etc. Upon the subjects and various fields it applies to, Mirzoeff (2009) stated as "visual culture is everywhere; all around us are screens on computers, game consoles, iPods, handheld devices and televisions, far outnumbering those used by the still-healthy cinema industry" (p. 2).

Although we encounter visual culture in such forms like; image, photo, video and animation, it is thought that it would be wrong to discuss visual culture only based on visual forms. Because the visual forms, presents us the meaning of visual culture by what is meant by the 'visual'. So, what is the meaning of the word 'culture'? Malcolm Barnard is the first name we come across in relation to this question. Whilst explaining the concept of visual culture, Barnard (1998) mentioned the terms 'visual' and 'cultural'. According to Barnard 'the visual' contains that everything can be seen and Barnard examines this concept under tree main topics: 'Everything produced or created by humans that can be seen', 'Functional or communicative intent: design' and 'Aesthetic intent: art' (Barnard, 1998). We can say that what Barnard means by 'the visual' equals visual forms like painting, sculpture, ceramics, photography, poster, video, animation and etc. Upon 'the cultural' concept, it is seen that Barnard explained it through titles of Kenneth Clark's Civilisation, Deyan Sudjic's Cult Objects and Ted Poldhemus's Streetstyle. With the concept of 'the cultural' it is seen that Barnard basically focuses on culture and the social phenomena covered by it (Barnard, 1998). The issues related to the production, distribution and reception of image in social structure and power-status relations are among the meanings that constitute the content of 'culture' in visual culture. Although Barnard tries to explain the visual culture on the axis of these concepts, he states that one-dimensional explanation cannot be made through these concepts due to the deep content of the visual and cultural concepts (Barnard, 1998, pp. 30-31). Therefore, the deep content of the concept of culture is the most important factor that reinforces this explanation.

There are many views on the concept of visual culture. Media, culture and communication researcher Mirzoeff (2009) points to the fact that visual culture is not only a subject in the context of the image object, but also a comparative literature area such as languages (English, French, Spanish, etc.). For this reason, Mirzoeff's (2009) approach to the concept of visual culture is based on meanings of gender, war, slavery, belief, race, etc., acquired by social factors in images. Another example; Howells and Negreiros (2015) approach to the concept of visual culture through the use of visuals. In the studies of researchers such as Duncum (2001, 2002), Freedman (2000), Tavin and Hausman (2004), Tavin (2005) etc., it is seen that the subject of visual culture was examined in relation to art education. It is possible to reproduce the approaches on the concept of visual culture with these and similar examples. However, as it is understood from all these explanations, the main subject of visual culture is the visual forms which are human production and the relations of these forms with the follower. The main issue that comes to the fore in the relations of the visuals with the follower can be said to be 'meaning'.

Visual contain manly forms of meanings according to the forms for production purposes; social and individual values, thoughts, beliefs and ideologies. Through picture, photo, video, animation, graphic design etc., it is possible for individuals to gain achievements through observational and cognitive contexts. Experiencing sensual pleasures by looking at an oil painting, wanting a commodity over an advertising poster or learning about a subject by watching a documentary are examples of the meanings that the visual language presents to the audience. The content of images and the acquisition of meanings through visualization raise the issue of 'learning through observation'. Especially in the age of technology, it is seen that these questions are at the top of the topics that concern the concept of visual culture such as; how we look at the images, how often we look at visual, what we get from the visuals, the reflections of the visuals, their reflection on our behaviors etc. In this study, Çakır (2014) states that "problem visual culture deals with the question of how a person sees, what he sees and, why he sees it that way" (p. 166).

The fact that the concept of visual culture shows a multidisciplinary concept enables us to look at the content of the concept from a broad perspective. The main reasons of this situation can be shown as the disciplines (philosophy, communication, history, sociology, anthropology, pedagogy, etc.) that are interested in visual culture have different scientific foundations and research subjects. Again, it is seen that the effects of environmental factors on image production are among the factors that broaden the content and direction of the concept. This feature which is possessed by visual culture is an element that makes the examination of the concept difficult. Therefore, in studies on visual culture, it is important to determine in which ways the concept is being examined in terms of the scope of the concept. In this study, the concept of visual culture is discussed in the context of the intense relationships of the visuals we encounter in daily life with the follower and the meanings that these relations have on the follower. In this study, it is tried to examine the reflections of visuals that have various meanings related to visual culture concept in the context of social learning.

Modeling in Social Learning and Visual Culture Oriented Focus on Modeling

People can take the people they see in their social environment and their behaviors as a model for their own behaviors. This situation is also known as one of the most basic methods that people use to develop their own behaviors. In this regard, Bandura (1977) stated his views as "...most human behavior is learned observationally through modeling: from observing others one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action" (p. 22) in his study. As we understand from his expression, model is a guide. The behavior of the model provides observers with preliminary information about the effect, direction and outcome of the behavior. It is possible to give 'mother and father, children role model' saying as an example on this subject. Because parents are the most easily observed individuals by children. It is another example that teachers' behaviors can show a model to students. Models can be not only well-known and reliable figures such as parents, siblings, teachers but also the individuals and their behaviors we do not know much about. Especially in the context of visual culture, through visual media, people who are known or presented with the concepts of popularity, fame and reputation, and their behaviors can receive wide acclaim. This situation emerges as an imitation of the behaviors of famous individuals through modeling by means of visual culture forms.

Analyzing the models and models in relation to visual culture in the context of television and social media images makes it possible to provide more illustrative examples on the subject. The television or social media images in which we communicate in everyday life present many models of behavior to observers in the context of social learning. Considering model's features of being liked, pleasant, successful and with high status (Kalkan, 2011), examples that meet these characteristics are frequently encountered in both television and social media images. This is an example of the fact that the people we perceive through observation in television, movies, series, talk shows, and advertising programs have a wide mass of acclaimed physical and behavioral characteristics.

Individuals' appearances in television programs or social media accounts can give various meanings to people who respect, appreciate or love them. In other words, the physical appearance of famous individuals in television

programs, their eating habits, cultural and sporting activities etc., features can be imitated as model behaviors by others. A similar situation can be exemplified in the context of shared images through social media accounts. Images shared on social media can provide various information to the observer about the behavior of the person sharing. Therefore, the behaviors of a social media user through images can be imitated by modeling by some observers. On this topic, it is possible to illustrate the social media stream with keywords #IceBucketChallenge (to challenge ALS with icy water). The videos of the world-famous names (Mark Zuckerberg, Justin Bieber, Will Smith, Hilary Swank, etc.), which they shared through social media, have reached large audiences within a short time and created a certain awareness of ALS disease. Following the world-famous names, many famous or non-famous names imitated the same behavior through social media and attracted attention to ALS disease. Also in Turkey, this situation led many famous names imitate the same behavior in social media. With regard to social learning, it is thought that these famous names, which have model characteristics for many people, have important roles in the behaviors they exhibit through social media, both to mimic behavior and to spread the subject to wide masses. Another example on the subject can be modelling from the TV series. Erjem and Çağlayandereli (2006) focusing on modeling from TV series; revealed that young people are affected by the characters they observed in the domestic TV series. Thus, it is possible to adduce the television series about high school and school life that corresponds to adolescence. It is thought that the school series related to the fun and funny aspect of visual culture may have various reflections on the behaviors of observing adolescents. The inclusion of exaggerated elements in the visual expression of such series can be presented to the observer, which is not related to real school life. Observers, associating the behaviors of characters in such series with their own behaviors, can mimic the behavior of the characters they observe in their real school lives. It is possible to duplicate similar samples associated with the subject. But the common feature in all these examples, is the role of social learning on the meaning of visual discourse in relation to visual culture.

Discourse and Model in Advertising Images

It is difficult to say that the images of television and social media always reflect natural and real situations. For this reason, the meanings of these images can also awaken unrealistic meanings on observers. It is thought that the presentation of the behavior to the observer with an exaggerated expression through visual forms, which would not be effective in model selection under natural conditions, may cause the behavior to be perceived as model behavior. This situation shows itself more clearly in advertising images. As Berger (1977) stated, “And publicity is the process of manufacturing glamour” (p. 131). The unreal and exaggerated elements in advertising are a basic feature used in strengthening the narrative. It is inherent in advertising to arouse interest for a commodity to sell it to the consumer. These elements of attraction are the idealization of the human figures in the advertising image and the popular aesthetic appreciation (Leppert, 2009). On this topic, Leppert (2009, pp. 15-16) states that the exaggerated elements in the advertising images and the information about the promise of happiness have the power to guide the behavior of the observers. In order to influence the observers in the formation of these effects, it is important to include elements with model features in the discourse of advertising images. Muscular, charismatic, handsome men and beautiful, thin and sexy women representations we see frequently in advertising images (Leppert, 2009), are some of the physical images and meanings that have the model features presented to the observers. It can also be stated that these samples reflecting the model characteristics in the advertisements vary according to the age of the observer population. In order to appeal to children, the use of images like famous athletes, superhero, cartoon hero, fairy, knight, magician, princess, etc., is associated with this situation. Such images are among the factors that reinforce the influence on children's perceived behaviors through observation. In view of the frequency of visual communication in daily life with advertising images associated with all these situations, the information we get from advertising through observation brings out the relationship between social learning and visual culture.

The Relation of the Basic Principles of Social Learning Theory with Visual Culture

There are six basic principles of social learning theory (Bandura, 1977). These are reciprocal determinism, symbolizing capability, forethought capability, vicarious capability, self-regulatory capability and self-reflective capability (Bandura, 1977). Because social learning emphasizes learning by observing others (Woolfolk, 2015, p. 702), the dimensions of learning from others are associated with these six principles. In this section, social learning and visual culture relations are tried to be discussed within the framework of these basic principles.

Reciprocal determinism, one of the basic principles of social learning theory, states that personal factors, environmental factors and behavior are in interaction with each other (Bandura, 1977). In addition to the fact that the individual can be affected by environmental factors, this means that he / she can affect environmental factors (Bayrakçı, 2007; Kalkan, 2011; Senemoğlu, 2012). Here, the concept of the environmental factor refers to the socio-cultural environment with which the individual establishes a relationship by observation. Today, the world of visual culture has a socio-cultural structure in itself. It is observed that the development of image-oriented social networking and internet technology has transformed visual culture into a private living space. For this reason, visual culture forms represent a special environmental factor area that provides observers with information on many subjects and content.

It is possible for people to observe their environment in their daily lives as well as through visual culture forms. For example; it is possible for someone who never had been in Egypt to learn much about the Pyramid of Cheops by watching a comprehensive documentary on it. Likewise, a TV series about a famous King who lived in ancient times and his life is likely to offer a variety of information to the observers about the King. TV series, documentaries, movies, videos, photos, pictures etc., many visual culture forms are among the environmental factors that an individual communicates through observation. The 21st century technology and the visuality the technology offers to humans has not only facilitated people's access to information through images, but also created a new world order created with images. For this reason, people can acquire various information, behaviors and sensations from visuals and they can affect other people with the visuals they produce. In particular, it is thought that the visual field associated with social media has a close relation with the subject.

Bandura states that people are in cognitive interaction with the environment and they see the environment as a symbol of mind in cognitive representations. (Kalkan, 2011; Senemoğlu, 2012). In addition to understanding the environment, it is seen that the symbolizing capacity of people also helps them to regulate environmental conditions (Bandura, 1999, p. 27). “By using symbols such as images (mental images) or words, people give meaning, shape and continuity to their lives” (Bayrakçı, 2007, p. 205). In the context of visual culture as an environmental factor, it is thought that people's communication with images in countless meanings and content has various reflections on their mental symbols. For example, when we question the image of our mind on the physical appearance and dimensions of the ideal human (male / female), we realize that the image that appears

in our mind is related to the images that visual culture presents to us. In other words, it is understood that the ideal human appearance and size created by the fashion world through images correspond to the image of the ideal human profile in our minds. Similarly, it is possible to say that the images shaped in our minds about the socio-cultural life of the future are images related to the visual forms presented by the cinema industry. Images created by science fiction movies about our future can help us to have ideas on cases like future technology, fashion, lifestyle etc. In part, it is possible that the visual culture will be able to serve the future of socio-cultural life by means of the images it creates in the mind. It is also possible to relate this situation to the foresight capacity, which is another principle of social learning. Foresight capacity means regulating and planning future experiences by taking advantage of experiences. Visual culture forms can present experiences to the observer through visuals. For this reason, vicarious information and experiences acquired through visual forms can be the basis for our future experiences. For example; the behavior of the models in the films or series that we perceive through observation, and the consequences of these behaviors can be an effective factor in directing our own behaviors. This is because it is thought that such examples, which we perceive through visual culture forms, have important roles on the formation of our mental symbols.

Another important principle of social learning is vicarious learning theory. Vicarious learning means that the individual can learn by observing other than his / her own experiences (Bayrakçı, 2007; Kalkan, 2011; Senemoğlu, 2012). In this study, vicarious learning is seen as the most important factor that emphasizes the relationship between social learning and visual culture. People can learn through visual forms if they can learn from others through observation. Because visuals are forms that offer vicarious experiences to people. Rather than two-dimensional visual forms like photo, picture, graphic design, advertising posters and etc., it is thought that especially the moving visual forms of the video genre have more decisive and effective roles. Because the moving visual forms in the video genre offer a more open narrative to the observers about how to associate a certain content with real experiences and to observe the result (reward / punishment) of the behavior they watch. One of the reasons for using educational videos in educational environments is related to vicarious experiences acquired from the visuals. Again, it is thought that visuals shared through social media accounts provide vicarious experiences to observers about the behaviors of the observed model. For example, the effort to be visible on social media is thought to be the result of vicarious learning acquired from others through social media. This does not mean that vicarious experiences from visuals always have a direct effect on learning. Although environmental factors may have important effects on learning, people can control their own behaviors through their own thought filters. People organize vicarious experiences through visuals by their self-judgment and self-reflection capacity.

Self-judgement and self-reflective capacities in social learning are concepts related to controlling, evaluation and regulation of individual's own behavior (Bayrakçı, 2007; Kalkan, 2011; Senemoğlu, 2012). Social learning, although it focuses on the relationship between environment and individuals, does not ignore the role of the individuals' relations with themselves in the deed of behavior. For this reason, people do not imitate the behaviors they observe from the environment unconditionally, they are known to convert them into behavior by passing them through their thought filters. This also applies to vicarious experiences from visual culture forms. Vicarious experiences acquired from visual culture forms are transformed into behaviors by means of self-reflective and self regulatory capability of the individual. For example; It is seen that violent computer games have important roles on young people to show tendency to violence (Dolu, Büker and Uludağ, 2010). However, this does not mean that violent behaviors observed in computer games can be imitated without being questioned. Although visual forms of culture offer vicarious experiences to the observer, individuals are able to evaluate the behavior observed through self-judgment and self-regulatory capacities, and to be able to formulate and organize opinions about the outcome. Therefore, social learning draws attention to the role of mental factors in the formation of behavior in addition to the effects of the environment.

Vicarious Experiences from Visual Culture Forms

People organize and form their own behaviors on the basis of the results of the behavior of others (Bigge and Shermis, 2004, p. 165). The results of vicarious experiences acquired from the model have important roles in imitating the observed behavior. Positive reinforcements that conclude the behaviors, affirm the repetition of behavior to the observer, whereas negative results (punishment) provide reasons for not repeating the behavior (Kalkan, 2011). In the 21st century socio-cultural environment, one of the most important areas where vicarious experiences are acquired is the visual culture forms. Because visual forms of culture offer people vicarious experiences in various subjects and content. Therefore, it is possible to say that vicarious experiences acquired from visual culture forms have relations with the concepts of 'vicarious reinforcement, vicarious punishment, lack of punishment and vicarious emotion'. Because of the experiences acquired through observation through visual culture forms and their results motivate the observer to mimic the behavior of the model.

The first concept which is related to the vicarious experiences of visual culture forms is vicarious reinforcement. Vicarious reinforcement seems to mean regulating our own behaviors based on the experiences we get from the results of others' behavior through observation (Bandura, 1977). As Bandura (1977) stated “people can profit from the successes and mistakes of others as well as from their own experiences” (p. 117). It is possible to reach these experiences that we have acquired through the observation of the result of the behaviors through the visual culture forms in which we communicate in daily life. In particular, in television commercials, vicarious reinforcement traces are observed (Gredler, 2009). The elements that advertising uses in the language of visual discourse to influence a particular audience seem to have features that corroborate vicarious reinforcement. For example; the use of famous people instead of ordinary people in advertising, benefiting from elements of attraction such power, status, beauty and handsets, and giving a place to the elements of reward and success, etc., create vicarious reinforcements on the observers. It is observed that the vicarious reinforcement related to these features encountered in advertisements arouses positive feelings about being fit or achieving social status on observers (Gredler, 2009, p. 357). It is possible to evaluate this situation not only in the context of television commercials but also in the context of many visual culture forms ranging from social media accounts, television series, movies, internet videos, advertising posters to artistic paintings.

Visual culture forms provide behavioral consequences for vicarious punishment as well as vicarious reinforcement. Vicarious punishment can be expressed as being away from imitating or exhibiting the observed behavior in relation to the negativity or punishment observed as a result of the behavior of others (Gredler, 2009). In the visual culture, vicarious punishment forms are more com-

mon in especially cinema films, educational videos, series and graphic designs etc. It is seen that especially the public service ad visuals on the subject offer vicarious punishment based behavior results to the observers. Public service ad visuals, which we frequently make contact with on television, in public transportation stations and in the streets are mainly related to health, human relations, social order etc., providing vicarious punishment information. Recently, the ill effects of smoking and the subject of passive smoking, which are frequently discussed in public spots, offer results to observers about the negativity of the result of behavior and vicarious punishment based experiences through visuals. However, there are cases where visual culture forms do not offer vicarious punishment behavior results to observers. Another important aspect associated with vicarious experiences subject is the lack of punishment and its relations with visual culture.

The absence of punishment is whence the negative behavior is not followed by punishment that observers believe that a negative behavior will not result in a punishment if repeated at different times (Gredler, 2009). Visual culture forms do not always give behavior to people about the subject and content related to real life. Behaviors to be punished in real life can be shown as ordinary or rewarding in visual culture. These situations are frequently encountered in violent computer games. A young child who observes that a game hero does not suffer from dangerous movements is likely to attempt to mimic the behavior in real life by thinking that this dangerous behavior will not result in a negative outcome. Therefore, the absence of punishment for negative behavior from visual culture forms is thought to cause this negative behavior to be interpreted as repeating in other settings as a result of the absence of punishment.

Another issue we get from the images through observation is vicarious emotion. It is seen that some emotions are not acquired congenitally but from the environment through observation (Kalkan, 2011, p. 255). It is possible to talk about the effects of visual culture on this subject. Especially the increase in the use of visual-oriented social media is a factor that promotes vicarious emotion act. Personal shares created through images can provide observers with vicarious emotion acquisition through the emotions of others. This situation shows itself more clearly in visuals associated with consumption culture. Because the images created on the basis of the ideology of consumption can cause vicarious emotion act towards artificial happiness on people. This discourse of artificial happiness refers to the state of feeling of having the latest meta model. As another example, it is seen that violent video games causes effects on children such as; negative emotionality, unresponsiveness, alienation and etc., (Dolu, Buker and Uludağ, 2010, p. 62). In this case, it is seen that human is related to vicarious feelings obtained from environmental factors.

Conclusion and Recommendations

The communication, we have established with the visuals created with the development of technology, increases rapidly. This increase in our communication with visual forms has changed the dimensions and direction of the learning subject through visuals. Vicarious experiences we get from visual forms in the context of social learning are on the rise along with the place of images in social life. Today, a lot of information can be quickly accessed through the visual-focused facilities offered by internet technology. Visual culture elements such as; Internet videos, documentaries, news, movies, serials, banners, pictures etc. are among the forms that provide access to information.

Images provide observers with information and experiences that include a variety of meanings. The language created by the visual forms through images transforms into meaningful information in the mind through the reception activity. Therefore, the experiences that visual culture forms offer to the observers as environmental factors are very similar to the indirect experiences acquired through observation in real life. The results of the experiences obtained from the visual culture forms have the power to shape our behaviors such as the consequences of our vicarious experiences in social life. In this age, where we live a part of social life through visual-oriented social media platforms, the reflections of our meanings on our behaviors are inevitable. In addition, this situation has various effects on individuals' self, identity, visual perception and aesthetic preferences. Because the experiences presented through visual culture forms have a decisive role on the individual's relations with themselves and with the society.

It is seen that, one of the most important subjects of social learning is learning from the model (Bandura, 1977, 1995, 1999; Gredler, 2009). The model that draws attention to social learning and its features are frequently encountered in visual culture forms. Features in social learning theory such as; model, power, and gender among the model as well as models of popular, admirable and pleasant people, etc., (Kalkan, 2011) are frequently encountered in the characters in areas that features, visual culture in the context of cinema, series, TV show, advertising, public spot, etc. The fact that the visual media field has a mass field increases giving a place to the individuals that correspond to the model features. Individuals who are becoming more and more visible in visual culture can observe the behaviors of others by observing others and exhibit behaviors that will be model for others. For this reason, visual culture forms provide observers, experiences of exhibiting, observing and imitating behaviors with model characteristics.

Visual culture is a phenomenon that expresses the representation of social life through visual forms. For this reason, there are close relations between experience of visual culture forms and experience of social life. The realization of social learning through visual culture forms is related to the experiences acquired through observation as in social life. Therefore, it has been seen in the research that principles of social learning (reciprocal determinism, symbolizing capability, forethought capability, vicarious capability, self regulatory capability and self reflective capability) are related to learning from the visual culture forms. Again, in the context of social learning, the vicarious experiences of visual culture forms are in relationship with vicarious reinforcement, vicarious punishment, lack of punishment and vicarious emotion. Experiences acquired through observation or visual learning from visual culture forms are the factors shaping the attitudes and actions of individuals in social life. This situation has gained importance especially with the increase of the area occupied by the visual culture in daily life. In the study, it was seen that the study of visual culture as an environmental factor in the context of social learning will help to understand and illuminate the changing, transforming and derived aspects of human behavior in the 21st century.

Based on this research, it is thought that the experimental studies that can be done for the relationship between social learning and visual culture in the future period will enable the development of different approaches to the subject. In this study, social learning and visual culture relations can be examined with a study that can be conducted on experimental and control groups (eg, the effect of social learning and visual culture based classroom activities on students' learning). Again, it is thought that specific dimensioned studies (eg, the effects of the acquired experiences on the bilateral relations in the cinema films) will allow for in-depth study of the relationship between social learning and visual culture. At the same time, educational institutions can contribute to the development of visual literacy levels of the individuals through pedagogical studies that can be done to resolve the meaning in the visuals, and this can create a pre-awareness on the acquisition of negative behaviors from visual forms.

In the critical pedagogy in educational institutions; It is foreseen that the provision of education by using methods of semiotics, pedagogical criticism, reception and etc., analysis for visual culture forms will have effective results on conscious visual literacy.

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