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Dear IEJEE Reader,

International Electronic Journal of Elementary Education is bringing you a comprehensive issue which covers many important topics in the field of elementary education. Dr. Berat Ahi addresses and discusses the mental models in preschool children's conceptualization. Researchers from Finland highlight how supervision supports inclusive teaching practices of the professional teachers. Three other researchers study and capture the primary school teachers' experiences with and opinions on constructive classroom managements. Dr. Theresa A. Coogan decribes and discusses the role of supportive school counselling for the establishment of a middle school career development program in Belize.

Two other researchers investigate the locus of control and personality traits of preschool teachers related their level of self-directed learning readiness.

The next paper investigates another important challenge in our time: the sensitivity of Students to the Natural Environment, Animals, Social Problems and Cultural Heritage.

Another paper which addresses environmental consciousness is written by Dr. Laurie James of Western Washington University, United States. Dr. Laurie's research is very concreate, practical oriented and demonstrated how the schools can make substantial gains with regard to minimizing waste in a school setting by reducing, reusing, recycling, and composting waste products by small but conscious strategies.

In this issue of the IEJEE the readers will also find two which address reading related topics. One has Turkish and the other has Arabic as its point of departure. In the international literature English-based perspectives on reading related issues have a dominating position. The field has a need of reading research which also takes the characteristics of different languages like Turkish and Arabic.

Dr. Birkan GÜLDENOĞLU of Ankara University, Turkey, investigates the effects of syllable-awareness skills on the word-reading performances of students reading in a transparent orthography as the Turkish has.

On the other hand Dr. Abdullah M. SERAYE of King Saud University, Saudi Arabia addresses the impact of different approaches to reading comprehension as the children have Arabic as their language.

As an Editor-In-Chief, I consider the mentioned two reading related papers as important contribution which can enrich and expand our understanding of reading in different language environments.

Dr. Ebru Melek KOÇ addresses several aspects of In-Service Training of English Language Teachers at Elementary Schools. Her reseach reminds us once more the importance of teachers' learning for students' learning and school development.

Dr. Angela Maria LA PORTE of University of Arkansas, AR, United States investigates the efficacy of the arts in a transdisciplinary learning experience for culturally diverse fourth graders. Her findings are convincing and inspiring us educators. With her words:

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"A cooperative school environment paved the way for student self-confidence and motivation for learning through (1) opportunities for student choice and decision-making and (2) collaborative, inquiry-based, transdisciplinary, project-based learning. Regardless of demographics, transdiciplinary learning through the arts challenged and motivated students to think and make decisions in collaboration with others, using and valuing the expertise of peers. Regardless of student ethnicity or socioeconomic status, learners felt empowered and enthusiastic about attending school and gained knowledge through inquiry and project-based opportunities. This progressive ideology and practice has the potential to benefit diverse learners in 21st century education."

Researchers BASAL, CELEN, KAYA and BOĞAZ of Yildiz Technical University, Turkey, investigate he illustrations in English course books in a Turkish context. The illustrations in the textbooks are the iconic representations of the realities in our lives. What kind of functions do they accomplish and what kind of roles do they have in the teaching-learning processes in the schools is an important area of research, but as much as we know it did not get enough attention from the researchers that it deserves. Therefore we appreciate that the four researchers submitted their paper to IEJEE. It's an informative paper because they

"… investigate the frequency of occurrence and functions of illustrations in English course books. Four course books (5th, 6th 7th, and 8th grades) approved by the Ministry of National Education in Turkey were analyzed. In this qualitative research, content analysis was used as the research technique. In the analysis, Levin's 1981 typology including five categories in terms of the functions of illustrations (decorational, representational, organizational, interpretational, and transformational) was employed. Based on the results, it was found that most of the illustrations in four books were subsumed under the category of representational function. The results also showed that the books were mostly lacking transformational, interpretational, and organizational illustrations. This is considered a serious drawback of the books in terms of content-related illustrations since they make abstract concepts more memorable, enhance the recall of details of texts, and facilitate students' comprehension. The study also provides recommendations for the use of illustrations in English language course books."

As one of the peer reviewers said *"this paper demonstrate the power of iconography"* in teaching-learning processes.

I want to express my deep gratitude to Ulaş YABANOVA, Doctoral candidate Mustafa BAKIR, Doctoral candidate Hasan TABAK, Dr. Hayriye Gül Kuruyer, and Dr. Gökhan Özsoy for their valuable coordination of the review process and for Dr. Turan Temur for his tireless efforts for ensuring the academic quality of the publishing process.

Editor-In-Chief
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A Study to Determine the Mental Models in Preschool Children's Conceptualization of a Desert Environment

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Abstract

This study aimed to determine mental models and identify codes (schemes) used in conceptualizing a desert environment. The sample for this study consisted of 184 – out of a total population of 3,630 - children in preschool education in the central district of Kastamonu, Turkey. Within the scope of this study, the children were initially asked to draw a desert-themed picture, followed by a semi-structured interview to seek their opinions about the drawing and clarify what a desert environment meant to them. According to the findings, the children referred to 38 different codes relevant to the conceptualization of a desert environment; the most frequently used were the sun (*f*= 160, 86.9%), sand (*f*= 100, 54.3%), cacti (*f*= 74, 35.3%) and camels (*f*= 52, 28.6%). During the interview phase, 33 children described a desert as a place where there is no life, although a significant number of the children (*f*= 65, 39.1%) did describe a desert as a place where plants and animals live. Moreover, the sun and its rays were disproportionately bigger in size, in order to emphasize the excessive heat associated with the specific ecosystem found in a desert environment; to reinforce this, humans drenched in sweat, the absence of trees and the prevalence of cacti and exotic wildlife, including camels, scorpions and lizards, were all features of the children's drawings. Based on these findings, it was inferred that the mental models in some of the children (*f*= 72, 39.1%) were scientifically informed, with a degree of accuracy, about a desert environment. On the basis of the findings, it is considered that determining mental models in children in relation to different ecological concepts can be beneficial to teachers and curriculum programmers involved in environmental education.

Keywords: Desert, Mental model, Draw and explain, Child, Ecological concept.

Introduction

After every natural disaster, we are reminded that all the ecosystems in the biosphere are under threat as a result of the human exploitation of natural resources. Considering that the biosphere is essential to the preservation of all life forms (Callenbach, 2012), such a threat poses a shared and significant problem for humanity. An ecosystem is a natural system that originates from the regular and balanced interaction between all living and non-living things (abiotic elements), and which is static-oriented and self-renewing (Dinç

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& Özkaya, 2015; Kışlalıoğlu & Berkes, 2012). In numerous international forums, a wide range of administrative and scientific precautions have been taken in order to find solutions to the increasing number of environmental problems facing the planet (Özsoy, Özsoy & Kuruyer, 2011). According to the Intergovernmental Panel on Climate Change, factors, such as temperature, rain and soil moisture, wind, humidity, and nutrient cycle, determine the structure and features of an ecosystem (Noble, 2014). About 45% of the earth's surface is covered with desert and semi-desert areas (Shekhawat, et al., 2012). Most deserts occur between 20o and 40o latitude (Noble, 2014). Although it would appear that temperature determines the basic features of deserts, they are generally characterized by temperate climates with low annual rainfall, high evaporation, and large seasonal and daily temperature contrasts. They are also home to a significant number of endemic plants, reptiles, and fish (National Fish, Wildlife and Plants Climate Adaption Strategy, 2012).

Therefore, like forests or oceans, deserts need to be protected against man-made climate change. That said, in recent years, it has been forests, oceans and seas that have generated the most environmental concern; less attention has been given to desert ecosystems, which are also critical to the preservation of all life forms (Fenk, et al., 2014). It has been reported that the rise in global temperatures (Li, Chen, van der Tol, Luo & Su, 2014), leading to the melting of icebergs (Barrett, et al., 2008), the increase in rainfall levels, dry air, and changes in humidity rates, pose a significant threat to the fragile life forms found in deserts (United States Global Change Research Program, 2009). Exposure to tourism has also resulted in negative implications for the desert ecosystems. BBC Nature (Bardo, 2012) and The Independent (Connor, 2006) have published articles that bring this situation to light, warning that the human impact of tourism as well as off-road racing are particularly harmful to mammals and plants found in the desert. Moreover, desert ecosystems are unhelpfully compared with the notion of desertification, in which terrain that becomes infertile and unable to support living things is referred to as a desert (Abella, Chiquoine, Newton & Vanier, 2015): a notion that is both ignorant and anthropocentric in respect of desert ecosystems (World Resource Institute, 2005). There is a risk, however, that such a notion may infiltrate the education system and allow the perception that deserts are worthless terrain to prevail (Judson, 2011). In order to prevent against such a scenario, individuals need to acquire scientific-based knowledge at the earliest opportunity in life.

As part of the Belgrade Workshop (1975), six core aims were agreed in relation to environmental education (UNESCO, 1975), including raising awareness and shaping positive attitudes from the start of early childhood education (Kahriman-Öztürk, Olgan & Güler, 2012). Awareness, or the state of being aware, when examined in detail, involves the interaction between sensory and cognitive processes with schemes (Becker, Kleinböhl & Hölzl, 2012). Knowledge, conditioning and attention are required for awareness to develop properly (Ross & Nelson, 1973). In Piaget's (1970) study, it is understood that learning occurs by an individual's existing prior knowledge interacting with new data in order to create new structures of knowledge. It is also understood that learning has a strong relation with the individual's own world of concepts (Piaget, 1970). Learning biological and essentially ecological concepts follows a similar process. Knowledge concerning biological concepts can be found in the consciousness from early childhood and is defined as "naive biology" (Hatano & Inagaki, 1997). This kind of knowledge means that children can establish definitions that are compatible with the biological world, in a simplistic sense, allowing them to understand the nature of biological entities and processes (Inagaki & Hatano, 2006). Moreover, such knowledge relies on cognitive structures that are resistant to change (Sungur, Tekkaya & Geban, 2001). Carey (1985) emphasized that children cannot explain biological concepts scientifically before they are

10 years old (Akt. Prokop, Kubiatko & Fančovičová, 2007). Vosniadou and Brewer (1994), meanwhile, proposed that, when learning involves structured concepts of relative complexity, children segment the concepts' structure into units and compartmentalize them within mental structures. Similar cognitive processes are performed when learning about ecological concepts. It is particularly challenging, however, to learn about structured concepts, such as forests, deserts and the oceans, that involve terms such as habitat and abiotic elements (Hatano & Inaagaki, 1997; Palmer, 1994; Strommen, 1995). In other words, while concepts can be acquired more instinctively in early childhood, the scientific knowledge needed to properly explain them emerges in later years (Hatano & Inagaki, 1997; Inagaki & Hatano, 1993).

According to the constructivist approach, cognitive structures are schemes that emerge through heredity and regenerate quickly after the birth, before they are categorized and constructed (Gilbert, Pietrocola, Zylbersztajn & Franco, 2000). These structures establish a relation between cognitive schemes and reality; this schematic approach to dealing with reality is called a mental model (Gilbert, 2004). Gentner and Stevens (1983, s. 1) characterize mental models as "structures that are related to the knowledge of the human about the real world and knowledge processing phase". Given that memory units involve symbols that reflect knowledge, rather than knowledge itself, the determination and structure of mental models play a significant role in the process of learning (Brunning, Schraw & Norby, 2014). Furthermore, developments in cognitive psychology have led to the use of mental modeling in the educational field (Gentner & Stevns, 1983). In Johnson-Laird's (1983; s. 397) view, the most significant reason for expansion into education is that "mental models play a great role in the mental reflections of concepts, expressing problems, organizing the events, the ways of perceiving the world, and understanding the social and psychological situations in daily life". When we think of mental models as the reflection of reality in an individual's minds, every drawing that the individual makes about a subject, concept or phenomenon can be used in evaluating the mental models at work (Moseley, Desjean-Perrotta & Utley, 2010).

By activating the imagination and thinking processes, drawing allows for an efficient way of understanding an individual's mental structures (Vygotsky, 1971). Furthermore, drawings can reflect not only the knowledge schemes, but also those of feelings and instincts (Yavuzer, 2010). By drawing a picture, a child may reveal their feelings, values (Günindi, 2015), and mental models in visual terms, which can help determine their true thoughts, desires, and wishes (Coates, 2002; Einarsdottir, Dockett & Perry, 2009; Leonard, 2006; Piperno, Biasi & Levi, 2007). When a drawing is analyzed appropriately, the concept within it, no matter how complicated, is effective in revealing the schemes that exist in the drawer's mind and the relationship between these and other schemes, as well as the drawer's cognitive structures (Schafer, 2012).

The technique of drawing a picture has been increasingly used in determining mental models. The literature concerning mental models within the context of education focus generally on concepts related to astronomy (Kurnaz, Kıldan & Ahi, 2012; Nobes et al., 2003; Panagiotaki, Nobes & Potton, 2009; Samarapungavan, Vosniadou & Brewer, 1996; Straatemeier, van der Maas & Jansen, 2008; Saçkes & Korkmaz, 2015; Vosniadou & Brewer, 1992; 1994). Studies that are specifically concerned with environmental education tend to focus on the concept of "green" issues (Ahi, 2015; Liu & Lin, 2015; Moseley, Desjean-Perrotta & Utley, 2010; Shepardson, Wee, Priddy & Harbor, 2007). Palmer's (1994) work is widely considered to be the pioneering study into how children perceive concepts related to the environment and environmental problems, while subsequent studies have tended to focus on how different ecological and biological concepts are perceived (Braund, 1998; Prokop, Kubiatko & Fančovičová, 2007;

Shepardson, 2002). The concept of the forest has especially dominated research in this area (Ergazaki & Andriotou, 2010; Strommen, 1995; Ahi, Balcı & Özcan, 2015). While Judson's (2011) study sought to determine mental models in relation to the concept of the desert, it is more concerned with how deserts are perceived in different cultures, rather than being appreciated as an eco-system. For Strommen (1995), determining the level of knowledge in children and young people about the complexity of ecological and environmental structures ought to inform how educational programs are designed. Taking the aforementioned studies into account, it can be considered that determining how knowledge in the mind, which creates perceptions in accordance with developments in the neuroscientific field, is stored, and in which schemes are used to explain a concept, has more kinship with recent developments in the cognitive field, than efforts to determine perceptiveness towards a concept. The aim of this study, then, is to determine the mental models in children in preschool education in relation to the concept of the desert environment, and in so doing answer the following questions.

- What are the codes (schemes) that are used by children in their mental models about the concept of the desert environment?
- What are the mental models in children about the concept of the desert environment?

Method

This study is a qualitative study which aims to determine the mental models in children who are in preschool education about the concept of the desert environment. The study is also a phenomenological study based on social structuralist philosophy. According to Creswell (2007), social structuralist philosophy provides the historical background to all kinds of concepts and phenomena that are experienced by individuals in daily life, and these concepts and phenomena, along with new experiences, are shaped by individuals. A phenomenological study can also be a qualitative study given that it aims to determine the reactions of individuals towards a large variety of concepts and phenomena; in a more profound sense, it also seeks to establish the experience, knowledge and perception about phenomena from an individual's own perspective (Fraenkel & Wallen, 2009; Wiersma & Jurs, 2005). This study was conducted using a modified analytic induction approach. A modified analytic induction approach creates a narrowly scoped study question, whereby the study is expanded until it complies with the universal model in the way that it involves the inspected phenomenon (Wiersma & Jurs, 2005).

In this study, it was assumed that the children's knowledge about the concept of a desert was determined by their mental models. In response, the mental models concerning the concept, which are of interest to a social structuralist based phenomenological study, were examined thoroughly. Codes were identified and explanatory remarks collected from the participants in the course of the research.

Population and sample

The population for this study were children in preschool education within the central district of Kastamonu, Turkey. According to the Turkish Ministry of National Education (2015), 3,630 children in total were in preschool education in this district during the 2014-2015 school year when the study was conducted. According to Fraenkel and Wallen (2009), although a minimum of 100 participants are enough to create a sample, attention should be paid to the generalization issue. This study was conducted with 184 children and, while the sample can be considered as representative of the study population, the researcher acknowledges that the number of the participants was a limitation of the study. In response, the researcher took great care in ensuring that the demographic variables

were compatible with the population (Fraenkel & Wallen, 2009). The demographic characteristics of the children in the sample group are demonstrated in Table 1.

Table 1. *Demographic characteristics of the children in the sample*

	Girl		*Boy*		*Total*	
	f	*%*	*f*	*%*	*f*	*%*
Age 4	34	18.5	28	15.2	62	33.7
Age 5	42	22.8	59	32.1	101	54.9
Age 6	10	5.4	11	6.0	21	11.4
Total	86	46.7	98	53.3	184	100.0

47.6% of the 3,630 children in the total population were girls, while 52.4% were boys (MNE, 2015). In terms of gender, compatibility between the population and the sample group is considerably high. In both the population and the sample, the age range was between four and six years of age. In terms of age distribution, the largest age group in the population consisted of those aged six, with those aged four being the smallest; in the sample, however, the largest age group consisted of those aged five, while those aged six were the smallest. However, the difference in age distribution did not pose a significant problem given that no inferential claims were made on the basis of age.

Acquisition of data

In the study, the data were gathered using the draw and explain technique. In other words, the pictures that the children drew and the remarks they made about them during the interview stage, constituted the research data for the study. The technique of draw and explain is one of the methods that is frequently used in the study of mental models (Liu & Lin, 2015; Moseley, Desjean-Perrotta & Utley, 2010; Shepardson, Wee, Priddy & Harbor, 2007). In this technique, the drawing establishes the codes (schemes) that form mental models, while the interview explores the experience and knowledge behind the mental model.

The data was collected in preschools in the central district of Kastamonu, Turkey, during the spring semester of the 2014-2015 school year. A mutually convenient time for conducting the research was agreed with school management and teachers beforehand. The researcher was only present in the school during the appointed times. In order to minimize the impact upon the children's preschool day, the research took place during art activity sessions, thereby locating the process within a typical class setting. The pictures were drawn on tables, with four children sat at each; only crayons or chalk were permitted for the drawing at the direction of the teachers. During the drawing stage, interaction between the children was restricted in order to prevent them from influencing each other and exchanging ideas. This was followed by the interview stage, which took place with each child individually in the playroom area, where the children are felt to be most at ease. The children who did not wish to speak with the researcher were included in the interviews with their teachers. The data acquisition protocol is demonstrated in Table 2.

Table 2. *Data Acquisition Protocol*

Drawing a picture of a desert landscape
1) Ask the child to draw what comes to his/her mind when thinking of a desert.
2) Discuss the codes in the picture with the child about what they signify, and ask them to label these codes in writing on the drawing.
3) Discussed whether the codes drawn by the child have any relation to each other.
Questions asked during the verbal explanation
1) What comes to your mind when you think of a desert?
2) What is a desert like in your opinion?
3) Is there life in a desert?
4) Are the codes on your drawing related to each other?

Data analysis

Initially, the code determination was performed using the collected data. Within this process, the researcher recorded the codes identified in each picture. Later, the interviews in relation to each picture were analyzed, and themes regarding the remarks were collated and compared with the existing literature. Already, correlation between these themes and those identified in earlier studies (Judson, 2011; Moseley, Desjean-Perrotta & Utley, 2010; Shepardson, Wee, Priddy & Harbor, 2007) was observable.

The children's remarks were then placed alongside the relevant themes by the researcher. Another researcher, who is an expert on environmental education, conducted the same process simultaneously, and the theme lists of both the researcher and the expert were compared using the Kappa (κ) measure in SPSS; a high compatibility was detected with .93κ. An integrated list was then sent to another environmental education expert with the remarks, following which .92κ was achieved. Accordingly, in both comparative processes, a high compatibility was detected (Pallant, 2011).

Findings

Using the data collected in the study, the codes that were identified in the children's drawings are set out in Table 3 below.

According to Table 3, 38 different codes relating to the concept of the desert were identified in the children's drawings. When analyzing the codes according to ages, the age five group produced the maximum number of codes (38), followed by age 4 (21 codes), and finally, age 6 (15 codes). The most significant variance in the codes was for categories relating to animals and abiotic factors. Among the codes in the drawings, the sun (*f*= 160, 86.9%), sand (*f*= 100, 54.3%), cacti (*f*= 74, 40.2%), humans (*f*= 65, 35.3%) and camels (*f*= 52, 28.6%) were more prevalent than other codes. The fact that the most-drawn codes were also the most essential schemes within the concept of a desert ecosystem is noteworthy. In addition, the pyramid code (*f*= 28) within the artificial environment category is among the codes that also appears relatively often. Another notable finding was that the highest number of codes was drawn by the children in the age five group, while the lowest number of codes was drawn by the children in the age six group.

Table 3. *Codes(Schemes) Identified in the Drawings Regarding the Concept of the Desert*

Codes	Age 4		Age 5		Age 6		Total	
	f	%	*f*	%	*f*	%	*f*	%
Human	15	8.2	37	56.9	13	20.0	65	100.0
Animal								
Bird	5	45.5	6	54.5	0	0.0	11	100.0
Camel	17	32.7	29	55.8	6	11.5	52	100.0
Lizard	0	0.0	2	66.7	1	33.3	3	100.0
Butterfly	0	0.0	1	100.0	0	0.0	1	100.0
Insect	1	20.0	4	80.0	1	20.0	5	100.0
Fox	0	0.0	4	80.0	1	20.0	5	100.0
Ant	0	0.0	3	100.0	0	0.0	3	100.0
Spider	2	25.0	6	75.0	0	0.0	8	100.0
Cat	0	0.0	3	100.0	0	0.0	3	100.0
Snake	0	0.0	3	100.0	0	0.0	3	100.0
Bee	0	0.0	1	100.0	0	0.0	1	100.0
Lion	0	0.0	1	100.0	0	0.0	1	100.0
Scorpion	1	50.0	1	50.0	0	0.0	2	100.0
Rabbit	0	0.0	1	100.0	0	0.0	1	100.0
Dog	1	33.3	2	66.7	0	0.0	3	100.0
Plants								
Cactus	19	25.7	45	60.8	10	13.5	74	100.0
Tree	15	68.2	7	31.8	0	0.0	22	100.0
Palm Tree	0	0.0	4	100.0	0	0.0	4	100.0
Bush	3	42.9	4	57.1	0	0.0	7	100.0
Grass	5	41.7	7	58.3	0	0.0	12	100.0
Flower	14	66.7	7	33.3	0	0.0	21	100.0
Abiotic Factors								
Sun	54	33.8	88	55.0	18	11.3	160	100.0
Cloud	16	34.0	22	46.8	9	19.1	47	100.0
Star	0	0.0	6	100.0	0	0.0	6	100.0
Sky	6	21.4	18	64.3	4	14.3	28	100.0
Sea	0	0.0	5	100.0	0	0.0	5	100.0
Dune	2	8.0	21	84.0	2	8.0	25	100.0
Sand	35	35.0	52	52.0	13	13.0	100	100.0
Soil	5	29.4	12	70.6	0	0.0	17	100.0
Oasis	0	0.0	2	100.0	0	0.0	2	100.0
Fruit (Date Palm)	0	0.0	1	100.0	0	0.0	1	100.0
Natural Events								
Rainbow	0	0.0	4	100.0	0	0.0	4	100.0
Rain	1	25.0	1	25.0	4	50.0	4	100.0
Artificial Environment								
House	8	53.3	6	40.0	1	6.7	15	100.0
Car	2	16.7	10	83.3	0	0.0	12	100.0
Pyramid	0	0.0	19	67.9	9	32.1	28	100.0
Indian Tent	0	0.0	0	0.0	1	100.0	1	100.0

Mental Model Theme: The place where plants and animals live
The codes in the Picture: Sun, camel, sand, cactus, bush

Picture 1. *C6's desert drawing (Girl, age 4)*

It was also reported that the reason why the sun was disproportionately larger in size and colored orange in some of the drawings was to emphasize the excessive temperatures associated with a desert environment. It was also stated that the reason for drawing cacti or trees with a bent shape was because it is difficult to find water in a desert. In 24 of the human figures that were drawn, the faces were unhappy while in one picture the human figure appears to be sweating. Likewise, there are unhappy faces on the animal drawings. Furthermore, the children made more frequent use of the sand code (*f*= 100, 54.3%) than the soil code (*f*= 17, 9.2%); some of them even drew dunes (*f*= 25, 13.5%). The colors used in the drawings were mainly various shades of red and yellow, while some of the trees (*f*= 11, 5.9%) were drawn in the shape of palm trees rather than less exotic kinds of tree. It was also noted that every child in the sample perceived deserts as permanently hot. Based on the codes identified in the drawings, it can be said some of the children (*f*= 48, 26.0%) perceived the concept of the desert as a specific ecosystem, which indicates a scientifically-based mental model.

Mental Model Theme: The place where plants and animals live
The Codes in the Picture: Sun, camel, cactus, sand

Picture 2. *C43's desert drawing (Boy, age 5)*

The remarks made by the children in relation to their drawings and the categories regarding the mental models based on these remarks are set out in Table 4 below.

Table 4. *Mental Model Themes Regarding the Concept of Desert*

Categories	**Age**							
	Age 4		Age 5		Age 6		Total	
	f	%	*f*	%	*f*	%	*f*	%
A place where animals and plants live	23	31.9	40	55.6	9	12.5	72	100.0
There is no life	11	33.3	18	54.5	4	12.1	33	100.0
A place where plants live	9	37.5	14	58.3	1	4.2	24	100.0
A place where animals, plants, and humans live	6	30.0	9	45.0	5	25.0	20	100.0
Living/nonliving (everyday life)	6	33.3	11	61.1	1	5.6	18	100.0
A place where animals live	6	40.0	8	53.3	1	6.7	15	100.0
A place of nature, a natural area	1	50.0	1	50.0	0	0.0	2	100.0

It can be seen from Table 4 that the children in the sample group, in explaining their drawings, define the desert mostly (*f*= 72, 39.1%) as a place where animals and plants live. Some of the children (*f*= 33, 17.9%), however, stated that there is no life in the desert. Considering the table in terms of age groups, the theme of a place where animals and plants live was emphasized the most across all age groups. Commenting generally on Table 4, it can be stated that some of the children (*f*= 72, 39.1%) possessed a scientifically-accurate mental model, while the other 112 children (60.8%) have a non-scientific-based model.

With regard to the definition that a desert is 'a place where animals and plants live', C12 stated that, "*[....] this place is so hot that humans can't take it. Animals are stronger than humans, so they can live there. The plants there have thorns. Animals eat them, also they eat each other. But there can't be cities there*". Another child, C96, said that, "*Humans can't live there, there is sand everywhere. But flowers live in the soil, and also some animals live in the sand, like scorpion. So they [plants and animals] live in the desert*". Remarks made in reference to the desert being a place where 'there is no life' generally concerned the notion that a desert is too hot to live in, as exemplified by C48's comments that, "*Deserts are very hot places. They are so hot that everything gets dry. Rain gets dry in the air. Look at my drawing. Rain got dry in the air. Since it is hot, living beings can't live there*".

Mental Model Theme: The place where humans, plants and animals live
The codes in the picture: Sun, cloud, camel, pyramid, cactus, human

Picture 3. C45's desert drawing (boy, age 6)

The remarks about 'a place where plants live' were based on two different beliefs. The first was that plants were not regarded as living beings. C13 remarked that "*only plants live in desert and that's because they are not alive*", while C19 believed that plants "*are not like animals or us, they can't breathe. They are not affected by heat. So they exist in desert, but not many*". The second belief was that plants survive by absorbing water from the soil. As C57 stated, "*Roots of plants are far beneath the soil, since they are not affected by the heat, they live in the desert*", while C171 commented that "*Plants feed on the water in the soil. There is so much soil in the desert. So they take the water in the soil for themselves. But humans and animals can't*".

Mental Model Theme: The place where plants and animals live
The codes in the Picture: Sun, cloud, sand and dunes, human, cactus, camel

Picture 4. C4's desert drawing (Girl, age 5)

20 children who participated in the study described a desert as a place where humans, animals, and plants live. Some of the remarks made concerning this category were that:

- *"Deserts are not like cities, but all the living beings live there." (C5)*
- *"Deserts are very hot and people sweat very much, (...) and animals go outside at night. And there are cactuses, they store the water. Anyone can live there." (C174)*

- *"Not as many as in here, but there are living beings in the desert, (...) and humans live there." (C65)*

Meanwhile, 18 children did not regard a desert environment as a much different from their everyday living environment, reflected by their remarks in the living/non-living category:

- *"The desert is not a different place. There are cars, roads, houses. It is a place like here." (C123)*
- *"There are jeeps in there, roads are covered with sand, but there are houses, people don't go out of their houses because it is hot there."(C93)*

15 children who participated in the study defined the desert as a place where only animals live. A commonly held view was that animals are much more capable of enduring harsher climatic conditions than humans and plants, along with a belief that only animals are able to live in the desert for this reason. C76, for example, claimed that, "*There is very little water in the desert. Humans can't live without water. And plants can endure for a very short time. (...) animals are very powerful. They can endure the lack of water. There are only animals in the desert*". Some of the remarks in this category emphasize the capacity for animals to adapt to a desert environment. C138 gave an impressive explanation in biological terms by stating that, "*Humans and plants can't hide from the sun by going beneath the soil, but animal can. Camels store water on their backs, and drink it from there. So they can live there*". Only two children defined a desert environment as a natural habitat. One of the remarks in relation to this category came from C6, who said that, "*Deserts are places where there are no humans. Humans go there to picnic or visit (...) they are natural places, like forests, where there is no one*".

Discussion

The aim of this study was to determine mental models in children about the concept of a desert environment. In the first instance, the codes that inform the mental models relating to such an environment were identified. According to the findings, most of the children (*f*= 160, 86.9%) included the sun code, with codes for sand (*f*= 100, 54.3%), cacti (*f*= 74, 40.2%), humans (*f*= 65, 35.3%), and camels (*f*= 52, 28.6%) also significant used. 38 different codes were identified in total from the children in the sample. All codes were classified under seven different categories, each with sub-categories as follows: 15 different codes in the animal category, nine different codes in the abiotic element category, six different codes in the plant category, four different codes in the artificial environment category, and two different codes in the natural event category, along with single-coded categories for humans and fruit. In terms of the variety of codes and the frequency of their use, resonances exist between this study and previous studies in the field. For example, Barraza's (1999) study also found that children depicted the sun, animals and trees when asked to produce drawings about their concept of the environment. In the (2007) study carried by Shepardson, Wee, Priddy and Harbor, a significant number of the participating children also included the sun, animals and plants in their drawings, while Özsoy and Ahi's (2014) study showed not only the significant prevalence of the sun, animals and humans in children's drawings about today's environment but also that of the future. Taking all these findings into account, it is reasonable to claim there are common codes specific to the environment that frequently inform the mental models in children regarding the desert ecosystem. The main explanation for this is provided by Mason and Langenheim (1957), in that the concept of the desert and the concept of the environment are to some extent synonymous in ecological terms, which allows for the identification of common schemes in mental models that are not complicated by any differences between scientific disciples. Considering that mental models are active cognitive structures related to the

mental models of different structures (Freca & Moreira, 2000), it can be concluded that children store the concepts of both the desert and the environment associatively in their minds.

The presence of the human code in drawings regarding the environment should be interpreted carefully. It has been established in most of the similar studies in the existing literature that the human figure is pictured either rarely or routinized and unrelated (Ahi, 2015; Özsoy & Ahi, 2014; Liu & Lin, 2015; Moseley, Desjean-Perrotta & Utley, 2010; Shepardson, Wee, Priddy & Harbor, 2007). In this study, while some of the children (*f*= 65, 35.3%) included humans as a code, only 20 children during the interview stage described the desert as a place where humans, animals and plants live. When the drawings were examined more closely, it was observable that human figures were either drawn alone or riding a camel in most of the drawings. This finding has parallels with other studies in the literature (Littledyke, 2004; Loughland, Reid, & Petocz 2002; Shepardson et al., 2007; Yardımcı & Bağcı Kılıç, 2010). According to this study's findings, while very few children (*f*= 20, 10.8%) have a false mental model regarding people living in the desert, a significant number of them see humans as part of the desert environment even though they are unable to describe humans' relationship with that environment clearly. One of the main reasons for this is that the linear development of children is not at a sufficient level to make sense of such complexity at a young age (Yavuzer, 2010). As Dunlop et al. (2000) stated, another reason could be how an individual's perspective towards environment is manifest. In other words, the children who were able to accept the desert environment as including living and non-living phenomena and systems include humans in their drawings, whereas those who viewed humans as a more superior than other living things did not include humans (Brechignac, 2011; Herrmann, Vaxman & Medin, 2010).

After analyzing the codes acquired during the study thoroughly, the results are impressive. Some of the children gave inferences about their perception of the desert in their drawings. This is particularly true where the drawing of the sun was concerned. For example, the common depiction of the sun as orange, whose rays are thick and tall, emphasized that the desert environment is perceived as extremely hot. One of the significant findings reported by Ahi (2015) is that children include depictions of soil when asked to draw something about the concept of the environment. In this study, however, it was noteworthy that the children drew sand in their desert drawing instead of soil. Moreover, even in the studies that have sought to determine the perception and mental model regarding the environment (Ahi, 2015; Özsoy & Ahi, 2014; Shepardson, Wee, Priddy & Harbor, 2007) or evaluate knowledge regarding a forest habitat (Strommen, 1995; Ergazaki & Andriotou, 2010), camels, spiders, foxes, lizards and scorpions are hardly depicted; in the desert drawings, however, the camel was particularly prevalent. Where humans and animals were drawn, they were depicted as sweating excessively and with unhappy faces; even the sun was, on occasion, given an unhappy face in response to the perception of extreme heat. What these findings indicate is that the children in the sample group perceived the concept of a desert environment as a different type of ecosystem with specific conditions of its own.

The remarks made by the children concerning their drawings further support this conclusion. For example, although most of the children (*f*= 72, 39.1%) defined the desert as a place where plants and animals live, some (*f*= 33, 17.9%) defined it as a place where there is no life. The findings from the interview stage correspond to the results of Judson's (2011) study, involving older children, which found that 78% of the participants in the control group and 82% in the test group defined the desert as a place where plants and animals live. For Judson (2011), this kind of response demonstrated that the children who participated in his study possessed mental models that were appropriate to the concept of

a desert environment. Accordingly, it is considered that the children who participated in this study also possessed scientifically-based mental models about the concept. Although the age groups in this and Judson's (2011) studies differ, perceptions about a desert environment do not appear to change with age (Alerby, 2000). Indeed, as Liu and Lin (2015) stated, mental models are structures affected by experience and culture rather than age. Although cultures change perceptions towards the relation between humans and the natural environment (Loughland, Reid & Petocz, 2002), common perceptions have been found in all cultures when it comes to the core environmental concepts (Liu & Lin, 2014). This helps to explain why the findings of this study are similar to studies conducted in different cultures.

In light of the findings, the following comments are made. Firstly, when seeking to determine a mental model, a number of different methods can be used other than the draw and explain technique. While drawing and explaining techniques have their distinctive advantages, it can be argued that working with different techniques may reveal different types of mental model.

Regarding the dynamic structure of mental models, it is important to observe how a mental model developed. Understanding how and where the children structure the knowledge that they acquire should be beneficial both to the curriculum programmers and teachers.

One of the basic aims of environmental education is that children and other learners possess accurate knowledge about concepts regarding the environment. Furthermore, understanding the relation between knowledge and mental modeling in an individual's mind will inform developments in the fields of neurocognitive and cognitive psychology. For this reason, it is believed that studying concepts regarding ecology within different disciplines and how they can be applied in the classroom will improve the effectiveness of environmental education.

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How Does Supervision Support Inclusive Teacherhood?

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Abstract

Supervision is a multidimensional concept and phenomenon. In this study, the advantages of supervision and its development in inclusive teacherhood was studied. Inclusive teacherhood means a teacher's professional development and the school culture's change toward participatory school for all students. The study analyzed the views of supervisors with a teaching background on how supervision can be a way to support inclusive teacherhood and its development. This was a qualitative research. The data were obtained using the focus-group interview method focused on supervisors with a teaching background. The interviews were conducted in five places in Finland. The analysis involved a combination of phenomenography, particularly the application called the variation theory, and the classic analysis that is typical of the focus-group research method. According to the findings, supervision provides individual and communal support to inclusive teacherhood. Individual support was given in four ways: empowering and promoting new teacherhood, clarifying teachers' professional growth and roles, helping teachers to evaluate their work, and supporting teachers in challenges at work. Communal support was manifested as strengthening collaboration, promoting a change in the work culture of a school, and developing a communal work approach. At its best, supervision can enable teachers' professional, communal, and personal development in an inclusive learning environment, but more time, resources, and opportunities for supervision should be arranged for teachers.

Keywords: Supervision, Inclusive Teacherhood, Supervisor with a teaching background, Focus group interviews.

Introduction

Supervision in the field of teaching means guidance offered for teachers to support their professional growth. At the moment, supervision has an established position as a well-known and widely-applied method in health care and nursing internationally (e.g., Brunero & Stein-Parbury, 2008; Milne & James, 2002), but in education and teaching, it

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has been less used. For example in Finland, teachers' supervision has been limited, for example, due to lack of funding and scheduling (Alila, 2014). As the teacher's profession becomes more and more versatile, the support provided by supervision can turn out to be quite necessary. Especially, the enhancement of inclusion requires the adaptation of new kinds of thinking, attitudes, and methods from teachers (Ainscow, 2005).

In Finland, supervision has been used for supporting professional growth and research for several decades (Alila, 2014). Although supervision in the field of teaching has been available, it has been established and more used, for example, in nursing. The main reasons for the lesser use in the field of teaching have been lack of resources allocated to it and that it has not an official status in the collective agreement on terms of employment. However, teachers' participation in supervision is currently voluntary, and therefore, teachers, who participate in it, seem to engage in the supervision process well.

Research on supervision is still relatively scarce and more information about its benefits and realization is needed in the field. This study focused on supervisors' perceptions on how supervision supports inclusive teacherhood. They all had a teaching background. Their experiences on how supervision supports the development of inclusive teachers were considered valuable and could provide important practical information.

The Multidimensional Nature of Supervision

Due to its varied theoretical background and practices, supervision cannot be distinctively defined (Milne, 2007). The lack of a solid theory of supervision has actually led to the diversified practices of supervising education (cf., Falender, Burnes, & Ellis, 2012). The concept of supervision resembles the guidance offered for novices teachers in their professional growth (Hobson, Ashby, Malderez, & Tomlinson, 2009; Sundli, 2007). Other close concepts are, among others, coaching (McLean & Hudson, 2012) referring to a supervision relationship where the coach attempts to support the client's work-related choices. In addition, process consultation and consulting (Lambrechts, Grieten, Bouwen, & Corthouts, 2009), and sparring resemble mentoring (Alila, 2014).

The most central methods of supervision are reflection and dialogue (Löfmark, Morberg, Öhlund, & Ilicki, 2009). Solution-orientation is at the core, when supervision focuses on recognizing a supervisee's strengths. The supervisee's reflection and progress are supported by leaning of experiences of success and goal-setting (McCurdy, 2006; Stark, Frels, & Garza, 2011).

Supervision can also include methods such as acting and drama (Edwards, 2010), and other artistic techniques (Denver & Shiflett, 2011). In an efficient supervision, the supervisor pays attention to interaction and relationships between supervisees, and sticks to task-centered structure (Ladany, Mori & Mehr, 2013). This way supervision can cover even more themes and offer more options to support change processes (Hanna, 2011). A functional group supervision necessitates that the supervisor and supervisees are committed to communal learning (Henderson, 2009).

Inclusion

Inclusion means basic values of students' equal participation that direct education (Hulgin & Drake, 2011). Equal opportunities within a heterogeneous group mean that all students get support in their physical, cognitive, emotional, and moral development within a safe, healthy, and intellectually developing environment (Lakkala, Uusiautti, & Määttä, 2014). The increase in students' participation is most of all resulting from teachers' educational choices instead of legislation (Shevlin, 2010).

Inclusive teaching requires a flexible curriculum noticing various learners, accessible school buildings and premises, segregated teaching and evaluation, and teaching staff who has proper education about inclusive practices (Lakkala & Määttä, 2011; Symeonidou & Phtiaka, 2009). Teaching practices suitable for students who need special support have proven to be suitable for other students too (Spaulding & Flanagan, 2012). In all, the development of inclusion in education renews teaching and related values, beliefs, and attitudes (Singal, 2008).

Students' need for support is fulfilled by adjusting the learning environment accordingly. Teachers cannot mold all factors in the learning environment, but they can influence attitudes, attention to segregated methods, and their awareness of students' reactions (Abbott, 2011). According to research, the best support to inclusive teacherhood is education about learning strategies, support of a multi-professional team, and assisting staff in classrooms (Alila, 2014).

The Universal Design for Instruction (UDI) is an approach to teach all students, and it includes the predictive planning and usage of inclusive teaching strategies (McGuire, Scott, & Shaw, 2006; Samuels, 2007). The principles of Universal Design for Learning (UDL) provide means to do curriculum planning so that it meets every student's various needs (Meo, 2008). Teaching arrangements in classrooms employing the UDL model include collaboration, technological equipment, and segregated teaching (Evans, Williams, King, & Metcalf, 2010).

Learning communities are developed through professional collaboration, reflection, and empowering methods. Thus, students, parents, and communality form the core of school development (Shepherd & Hasazi, 2009). Notwithstanding, the development of inclusive teaching means that special education teacher and classroom teacher education has to renew, too. Collaboration between student teachers of general and special education should be supported already during their education (Laarhoven, Munk, Lynch, Bosma, & Rouse, 2007) and prepare them to realize the broadness of a teacher's work (Florian, 2009).

Supervision in Teachers' Work

Supervision in teaching also leans on collaboration, reflection, and dialogue (Pattison, 2010) as it focuses on a more profound understanding of a teacher's multidimensional role and on a stronger trust in one's teacherhood (Paliokosta & Blandford, 2010). In teachers' supervision, reflection means learning about the practical work. One can develop one's professional skills and practical work through reflecting one's experiences with other professionals in supervision (Carroll, 2010; Clouder & Sellars, 2004). Supervision provides a secured place to reflect one's performance in one's own work (Hawkins & Shohet, 2012). According to supervision studies, teacher have been able to change their beliefs and raise their awareness when they have been given the opportunity to reflect on issues related to teaching and learning (Jordan, Schwartz, & McGhie-Richmond, 2009). This is especially important to the development of inclusive teacherhood, because the approach requires profound understanding about the nature of inclusion and teachers' ability to reflect on their personal teaching styles, practices, and teacherhood.

Supervision is based on experiential learning (Milne & James, 2002), constructivism (Ibrahim, 2013), team learning (Gillespie, 2012), and the principle of life-long learning. Interaction with colleagues in the learning work community and the opportunity to see colleagues' professional development strengthen teachers' meaningful life-long learning (Alila, 2014).

While supervision is almost a self-evident part of many professionals' work, such as psychologists and psychotherapists, it is strange that supervision has not become an established part of teachers' work. And still teachers' work has fundamentally changed during the shift toward inclusion (Potmesilova, Potmesil, & Roubalova, 2013). Supervision is an efficient support for the development of teachers' expertise. It supports, predicts, guides, and renews teachers within the increasing demands of their work (Goodman, Brady, Duffy, Scott, & Pollard, 2008; Luke, Ellis, & Bernard, 2011). Supervision is needed to help to confront challenges in teachers' work, which have increased due to inclusion.

Method

The purpose of this study is to describe how supervision supports inclusive teacherhood according to supervisors with a teaching background. The following research question was set for this study: According to supervisors with a teaching background, how does supervision support inclusive teacherhood and its development?

The qualitative study approach was employed in this research. To answer the research question, the focus group interview method was chosen as the data collection method. The methodological approach represents fenomenography as it studied human beings' different ways of experiencing, conceptualize, and understand the surrounding world and its phenomena (Marton, 1988). In addition, the research is connected with the variation theory of fenomenography because the other purpose was to analyze the dimension of variation within the phenomenon under investigation and to compare various viewpoints about it (Dahlin, 2007).

Focus group interviews were carried out in the spring of 2010. Eleven supervisors with a teaching background and from five places in Finland were recruited as the research participants. The criteria of selection were that they had been supervising at least for one year and that they were members of the Finnish Supervisors' Association. This association accepts only persons, who have completed a long-term supervising education, as its members. The research participants were women aged from 35 to 65 years.

A focus group interview is a method for discussing a topic in a group, and the discussion is led by the interviewer (Morgan, 2008). In this study, the focus group received nine questions to discuss. The purpose of the questions were to analyze together how mentoring supports inclusive teacherhood (e.g., How could supervision benefit teachers who want to employ inclusive teacherhood?; How could supervision support the development of inclusive teacherhood?) Focus group interviews have increased interest in many fields of research as they provide a functional way of sharing understanding about themes that have been less studied previously (Hesse-Biber & Leavy, 2011; Stewart, Shamdasani, & Rook, 2007).

When analyzing the data gathered by focus group interviews, themes that emerge in all or several groups and that are mentioned by many persons within one group are the most important ones (Hesse-Biber & Leavy, 2011). In this study, the classic analyzing principles of focus group interviews were followed systematically (Krueger & Casey, 2009).

The core of classic focus group interview analysis happens by cutting, categorization, and organization through comparisons and juxtapositions one interview question at a time (Krueger & Casey, 2009). Each answer to a question is read and compared in order to find if the same theme or issue has been mentioned earlier. Similar issues are thus combined together and together they form a category. The analyzing process was long and laborious, and during it, the categories were re-organized and even re-created several times. Eventually, all answers found their places in categories that are here introduced as the themes within the main results. Indeed, another purpose of the analysis was to find the

so-called main thoughts in the data. It refers to a mutual understanding about a theme among the majority of research participants (Vaughn, Schumm & Sinagub, 1996). In this study, the main results are organized into themes that represent the number and width of, or the mutual understanding among the supervisors about, these categories in the data.

In the Results section, themes in these two main results categories are introduced by including quotes from the focus group interviews. The codes consist of numbers and letters. The number after the letter K refers to the ordinal number of the quote in the data. The number placed after comma stands for the page the quote can be found in the data transcript.

Results

The findings are organized according to two main results categories that are supervision as personal support and supervision as communal support.

Supervision as Personal Support

Supervision was mentioned to support inclusive teacherhood in six ways. The first was empowering support for teacherhood. Supervision was described to enhance the coping of teachers who work in inclusive learning environments. Teachers learned to make choices that helped them control their work loads. Thus, the varied ways of benefitting from supervision provided an opportunity of empowering in a teacher's work. This was described, for example, as follows:

> *"...I think that as an approach it [inclusion] is really hard, so you need supervision to stay in control with the approach.." (k276,24)*

> *"So I guess the purpose is... that also teachers are doing good and are able to enjoy their work." (k274,24)*

The second theme was the support to the new kind of teacherhood. Supervision provided teachers with opportunities to discover how their teacherhood matched the inclusive teaching approach. This helps them to develop their inclusive teacherhood. When it comes to a teacher's profession, the change does not only cover their professional identity but their own personality too. Supervision can pay attention to this part of the change considerably.

> "...you could say that it helps to find that other kind of teacherhood too… the so-called other side of yourself that you need when collaborating" (k666,63)

> "I wonder if it is the increase of self-knowledge; if you see the various sides of yourself, the features in which you are a little weaker or worse, and those that are your areas of expertise and strengths and everything in between." (k742,70)

Thirdly, supervision supports teachers' professional growth, as it helps recognizing the development. Supervision can initiate, maintain, and help the development of professional skills and learning at work that inclusion demands. In addition, supervision can help teachers notice their needs for development when they work in an inclusive learning environment.

> *"…the more the teacher works and the supervisor guides him or her…so the idea of inclusive teaching becomes fulfilled as there are always new groups that include [students] who act differently, think differently, and … the teacher always has to practice with every new group and increase his or her inclusive awareness." (k750,71)*

> *"...you would help… sort of those people also in the work community to enter the limit of their zones of proximal development, like we try to help the students in the special education classrooms… in the same way, supervision helps you to find it." (k770,75)*

Supervision can help teachers to perceive their work role. This means that teachers can clarify and understand how their basic task as teachers changes when developing toward inclusive teacherhood. Supervision provides an opportunity to perceive teacherhood as shared expertise instead of traditional view of teachers acting alone and by themselves. Interviews showed how supervisors discussed the importance of pinpointing the core of teachers' work and that development toward inclusive teacherhood is a process:

"Probably also that you know what is sufficient…" (k277,24)

"To see your own incompleteness." (k253,23)

Fifthly, supervision provides an opportunity to evaluate one's work. Teachers are able to view their work from a distance in supervision. The development toward inclusive teacherhood is supported by guiding the reflection and evaluation of one's work. Supervision teaches a more professional approach to teachers' discussion and interaction skills, and little by little, this reflective perspective becomes one's internalized part of developing in a teacher's work.

"So that you can have a little look at it with an outsider" (k228,21)

"You can sort of compare various viewpoints" (k189,18)

Finally, supervision was also perceived to help with coping with various challenges and difficulties related to inclusion. One cannot particularly practice a teacher's work in front of a class but supervision provides an opportunity to it. Supervision helps coping with challenges at work, and the supervisor's expertise and reliability are extremely crucial in this sense, as highlighted by the interviewees.

"Supervision can help you to internalize the inclusive approach so that first you are just with regular, nice-behaving schoolchildren and do just that teacher's basic work, and then these challenging children and the encounters with them can first seem to be far away from your own comfort zone. But when you get more experienced things change, and your ability to work expands, and your comfort zone gets sort of bigger. So you can control your work more." (k709,68)

"And that the provoking situation happens in a supervision situation, it is a safer situation compared to [if you are alone] and then you can… as a teacher, avoid that confrontation inside your classroom and with that student or a group of students, when you catch the situation through supervision" (k753,71)

Supervision as Communal Support

Supervision was perceived to support inclusive teacherhood in a communal sense in five ways. First, supervision was mentioned to support versatile and multiprofessional cooperation. Students and teachers in teacher training or continuing education do not learn about how to solve conflicts or get help in their work communally. Therefore, supervision was considered a functional channel to practice collaboration and enhance one's collaboration skills.

"If you think that… you school is an inclusive school, you cannot just plan it by yourself, but you have to collaborate with others." (k822,80)

"And then also the collaboration relationships… other teachers and the work community, and parents" (k225,21)

Secondly, supervision supports the change of the whole school culture toward inclusion. Supervision helps developing new practices by adjusting them to the prevailing school culture. In addition, supervision can serve as a tool to lead the change in a controlled manner.

> *"Exactly, when you aim toward it… It means that the school is in a state of change, and that supervision is about supporting the change and that you cope with the change… cope within the turmoil of change, go through with it, and understand that changes are needed if you are to reach that [inclusion]" (k665,63)*

> *"That is really important… to know what suit your own work community, that is really crucial… supervision has a great role in it, I suppose." (k685,65)*

Thirdly, supervision was mentioned to support teacher individuality within the work community. Supervision lets the inclusive work community spring up through noticing its members' individual capabilities. The importance of reflection as the method of supervision becomes emphasized in this form of support. Supervision supports teachers' individuality in the work community and helps to pay attention to each teacher's uniqueness.

> *"It points out it if you become heard in your supervision group in the first place, it is really important, and they are easily forgotten in the busy school life… so that you can discuss even a few thoughts and get the feeling that you are heard" (k688,66)*

> *"Also in that sense, if you think that you could dare to be more genuine, be yourself" (k689,66)*

Fourthly, supervision supports the development of communal work approach. Supervision can support the development of inclusive teacherhood by supporting it as a communal process. Communal work approach requires new kind of attitude to teacherhood, but the adaptation of the attitude can be fostered by supervision. The interviewees discussed how supervision can promote adults' collaboration and communality:

> *"And indeed, supervision is functional, when people who work in the same workplace, bring the well-being among those people forward in every way." (k724,69)*

> *"And probably when this work community starts to develop, the one with the highest resistance has to develop to some direction although he or she did not participate in it at all." (k736,70)*

Finally, supervision is a support to the shared goal of inclusion at school. It takes the whole school community toward inclusive teacherhood and helps finding a shared understanding about inclusion. Because, eventually, inclusion can only happen if the whole school community shares the idea about the objectives and meaning of inclusion.

> *"And it will become a shared goal, because this is how you make the rules of the game, the mutual goal where you are heading…" (k206,19)*

> *"…one of the requirements of inclusion are that you can have the shared focus" (k499,46)*

Conclusions

As the results showed, supervision supports inclusive teacherhood individually and communally. In this study, the focus group interviews surfaced the number of ways supervision can and should support the development of inclusive teacherhood. However, it seems that the theoretical diversity of supervision hinders the support of inclusive teacherhood to some extent. According to this study, the core elements of supervision are goal-orientation, confidentiality, and the supervisor's professionalism. At its best, supervision can form a learning environment of inclusive teacherhood, in which the stability, regularity, and continuity of supervision are the key.

Although supervision that aims at supporting inclusive teacherhood is quite manifold, the main points are to pay attention to the practical challenges introduced by student diversity and to reflect on the main issues with a wide perspective. The varied methods

used in supervision can inspire inclusive practices in teaching, as they encourage teachers to use a wide range of teaching methods and to understand the importance of flexibility in teaching arrangement in practice.

The process-like nature and sufficiently long period of supervision supports supervisee's professional growth. It provides enough time to test and evaluate various solutions and one's inclusive teacherhood. Supervision as the means to support teachers' professional development and learning helps teacher to discover their strengths and enhances the renewal of school culture. The Finnish supervision strongly relies on ethical principles according to which supervision must be highly confidential (Alila, 2014). This kind of confidentiality provides a secure and goal-oriented space for teachers to develop professionally toward inclusive teacherhood.

The reliability of this study can be evaluated from many points of view. The head researcher of this study is a supervisor with teaching background herself, and therefore, her position is not totally objective. Obviously, she has a positive stand and experience about supervision and its significance to the development of inclusive teacherhood. This might have influenced on the way the results are interpreted. However, the personal viewpoint to and experience of the research theme also means immediate experience and profound understanding about the phenomenon. To improve the reliability of analysis, the findings and conclusions were discussed with the research group. In addition, the purpose was to bring out the supervisors' voices when reporting about the findings. This was also to improve reliability as the excerpts from data illustrate how the themes were brought out and discussed by the research participants.

As the number of the research participants was small, the study could even be defined as a mini focus group research (Krueger & Casey, 2009). However, the size of the group is also justifiable because these people present a marginal group based on their expertise and supervision experience in Finland. The interviewees also showed a positive attitude to supervision, and its possibilities to support the development of inclusive teacherhood were, thus, seen very high. Their versatile experiences provided a profound discussion about the support supervision can provide to the adaptation of inclusion in schools. The way the supervisees had experienced supervision was not studied in this research, but it would make a good add and presents a need for further research.

Discussion

The findings of this study are in line with other researchers' findings. For example, Hobson, Ashby, Malderez, and Tomlinson (2009; see also Sundli, 2007) have confirmed that supervision can promote the renewal of teaching practices. Supervision is a method of supporting professional development toward participatory school for all students (Potmesilova, Potmesil, & Roubalova, 2013). In all, supervision is a way to view one's professional development through a confidential relationship. "Confidentiality in coaching and supervision is key", have noticed also Connor and Pokora (2012, p. 3). When the supervisor has a special training for this task, it is possible to offer quality supervision. Supervision can become a learning environment in which teachers can learn and expand their skills and knowledge toward inclusive teacherhood and in which their values and attitudes to inclusion mold with their professional growth. Supervision can also help teachers to cope with the challenges of their work and to develop, learn, and dedicate to it, which was also shown by Hawkins and Shohet's (2012) study.

Fundamentally, supervision as a manifold method helps supervisees to acknowledge their own expertise (see also Shachar et al., 2012). The development of inclusive teacherhood necessitates also the recognition of one's strengths and weaknesses, needs for development. Teachers are also expected to react to others' expectations. Supervision

can support their professional growth so that teachers can feel capable to renew not only themselves as teachers but also their work practices as inclusion necessitates with and in the multiprofessional work community. Inclusive education calls for a change in school practices (Bourke, 2009), and, therefore, teachers must feel supported to develop toward inclusive teacherhood (Ainscow, 2008).

Although supervision also requires financial investment, its profits can be seen in the future. Indeed, for example Zepada (2011) points out that the development of inclusive school challenges the school administrators to recognize, understand, and promote features that enhance the success of all students at school. The beneficial outcomes of supervision include better work satisfaction and attendance, renewed and more reasonable teaching arrangements, and overall improvement in work quality. As more time and opportunities for supervision are arranged for teachers, it can become a natural method in the field of education, as well.

However, also supervision has to develop in order to meet the needs of changing work (see also Connor & Pokora, 2012; de Janasz & Sullivan, 2004). In school work, these changes include, among others, new curricula, the development of learning strategies and equipment, and the diversifying student population with various skills, attitudes, values, and cultures. From this perspective, the framework and multi-method nature of supervision appear a downright advantage and opportunity.

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Primary School Teachers' Views on Constructive Classroom Management

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Abstract

Behavioural teaching programmes that had long been used in Turkey began changing in 2005. In a significant development, new programmes based on constructivism have come to the fore. The adaptation of teachers in this transitional process and their internalization of this new approach have been of utmost importance for the success of the programme. Difficulties faced by experienced primary school teachers in particular have become a serious matter that should be qualitatively addressed. This study aimed to reveal the views of experienced primary school teachers (175) about constructive classroom management. Interviews were employed to do so. The study revealed that a large majority of the interviewed teachers considered themselves to be successful at classroom management (thanks to factors like experience, close contact with students, their affection for students, etc.), while almost half of the teachers thought that classroom management had been much easier in pre-2005 teaching programmes. The results also exposed disturbing behaviours, among them students fighting, the use of improper language, disrupting in-class teaching processes and irrelevant talking among students. The coping techniques adopted for these behaviours were warnings, punishment and more enjoyable teaching that incorporated a range of different activities.

Keywords: Constructivism, Behaviourism, Classroom teacher, Classroom management.

Introduction

In the Turkish education system, different approaches and theories have been adopted at different periods to produce teaching programmes, and these approaches and theories have been taken into account when setting educational goals. Constructivism, initially referred to as a learning theory, is today considered as a teaching theory, an education theory, a theory of the origin of ideas, and a theory of both personal knowledge and

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scientific knowledge and a curriculum design theory (Matthews, 2002). Constructivism has been favoured in developed countries since 1980 and came to prominence in Turkey in 2005, when primary school programmes were developed on the basis of constructivism. While teaching programmes became permeated with constructivist ideas from 2005, researching –questioning educational philosophy as a different implication of constructivism – was only included in some programmes in 2013.

Constructivism focuses on individuals and relies on the idea that learners are actively involved in the learning process, and responsible for their own learning (Dağdelen & Köstereliоğlu, 2015; Glasersfeld, 1995; Hand & Treagust, 1995; Henson, 2015; Schneider, Krajcik, Marx & Soloway, 2002; Shiland, 1999; Staver, 1998; Zarotiadou & Tsaparlis, 2000; Wedin, 2015). According to this theory, an individual associates their prior knowledge with new knowledge that they have obtained by interacting with their surrounding environment (Driver, 1995; Hand & Treagust, 1995; Hewson, 1992; Karahan & Roehrig, 2015; Kelly, 1997; Leow & Neo, 2014; Niaz, 1995; Osborne, 1996; Shiland, 1999).

Constructivism aims to develop individuals who have multiple viewpoints and advanced problem-solving skills, and who are able to defend their thoughts and rights and organize. In constructive settings, the person taking responsibility is expected to have skills such as initiative-taking, self-expression, communication, critical thinking, planning and practicing what they have learned in real-life settings (Marlowe & Page, 1998). This requires the emergence of a brand new type of classroom management. Constructivism affects not only the reconstruction of knowledge, but also practices such as school management and classroom discipline. As a result, the roles of teachers and students are different from those in traditional education systems. In particular, the use of strategies based on hands-on and experiential learning in science education, central to fundamental education, is one of the most established aspects of science education. Experiments form the basis of laboratory management, which is undoubtedly essential to science education. Experiments are particularly employed in science education to account for correlations between natural phenomena and to explain the laws concerning these correlations. Some studies suggest that problems concerning classroom management may arise during individual and group experiments (Akgün, 1995; Alpagut, 1993; Ekici, 1996; Öztürk-Akar, 2006).

Classroom management consists of practices that help to create an efficient setting for maintaining the order required for in-class learning (Celep, 1997; Hoglund, Klingle & Hosan, 2015). 'Order' here refers to the high-quality and acceptable student behaviour to ensure the success of in-class activities. Classroom management is the process of creating and preserving/sustaining order and reinstating it when disrupted (Arens, Morin & Watermann, 2015; Burden, 1995). Classroom management models have been categorized by some researchers as reactional, preventive, developmental and holistic (Balay, 2003; Başar, 2005; Demirtaş, 2006), while others have classified them into five types, namely traditional, reactional, preventive, developmental and holistic (Erdoğan, 2003; Kaya, 2003; Yaka, 2006).

Classroom management models can be summarized as follows. Teaching and learning activities are centred on the teacher in the traditional classroom management model. Here, teachers are active, while students remain passive during the course of in-class activities. The reactional model refers to a model where undesirable behaviours are addressed by using rewarding or punitive activities. The preventive model is intended to create a classroom setting that is able to foresee and prevent any possibly disruptive behaviour. It can also be regarded as a model for taking precautionary measures against probable classroom problems. The developmental model takes into consideration the developmental characteristics of students that are deemed essential to classroom

management. In-class activities should be designed in accordance with the physical, mental and affective developmental steps of the learners. Finally, the holistic model not only prioritizes the preventive model, but also allows teachers to adopt any action from other models to eliminate undesirable behaviours and situations (Başar, 2005; Şentürk, 2006). In today's schools, teachers face problems posed by a shortage of classroom management models and methods for dealing with ever-changing student profiles. As such, further research is needed to determine the best classroom management model for both teachers and students in state schools (Roadhouse, 2007), particularly in light of the fact that the transition from behaviourism to constructivism can be labelled as a radical change in context of Turkish schools.

For Glasersfeld (1995), the principle underlying constructivism in education is that knowledge is not passively received, either through the senses or by way of communication, but it is actively built up by cognitive understanding of the subject. Learning settings where students are active participants may also pose problems pertaining to classroom management and student behaviour. A review of related studies on classroom management and unwanted student behaviours showed that studies on undesirable student behaviours primarily focus on primary schools, and adopt quantitative research methods (Aksu, 1999; Aydın, 2001; Civelek, 2001; Demiroğlu, 2001; Girmen et al., 2006; Sadık, 2006; Sayın, 2001; Terzi, 2001). According to the results of these studies, the most often encountered undesirable student behaviours include indifference to the teacher and the subject, talking to friends, complaining about friends and dealing with subjects irrelevant to the class. These studies also reveal that in return, teachers warn or slap students, threaten to give them low grades, ignore misbehaviour, send misbehaving students to school administrators, remind them of classroom rules and talk to their parents, amongst others.

In research on strategies for coping with unwanted student behaviours, Tümüklü and Yıldız (2002) found that teachers use strategies such as eye contact with a student that misbehaves, talk to them about their behaviour, remind them of classroom rules, call out their name and motivate them to participate. According to results found by Kazu (2007), in the case of a minor disciplinary issue, teachers tend to ignore it, spend the rest of the class advising the student to take care of the problem, warn the student using body language and/or relocate the student. In the case of a serious issue, teachers consult the school administration (which corresponds to "medium frequency" in Kazu's study).

In a study by Clunies-Ross et al. (2008), there is a strong correlation between the use of reactive classroom management and showing a negative reaction to the unwanted behaviour of the student. Moreover, the study shows that there is no significant relationship between preventive management strategies and increased student on-task behaviour. Additionally, the study also found a significant relationship between teachers' positive reactions and students' high level of on-task behaviours. In another study on the views of trainee teachers about classroom management strategies, Çakmak, Kayabaşı and Ercan (2008) found that trainee teachers thought that the prerequisite for successful classroom management was a good command of classroom management strategies.

According to Gömleksiz (2007), the views of teachers on the new primary school programme being considered and its various variables, there is no significant relationship between teachers' educational setting and internalization and practice of the programme. The study also suggests that the success of an educational programme greatly depends on teachers' internalization of the programme and the implementation of the program in line with its predetermined goals. This result verifies the feedback from teachers regarding changes as being among the important factors for ensuring that changes emerging in the educational system achieve predetermined goals. In the study "Teachers' Views about

Effects of Constructivist Approach on Classroom Management", Çandar and Şahin (2013) aimed to identify the probable effects of primary school teachers' constructive approaches on their classes and classroom management. The study concludes that constructivism, compared to the traditional approach, requires that teachers assume new roles and responsibilities in classroom management and that the relevant activities change in accordance with the constructive approach.

The long-used behavioural teaching programmes began to change in Turkey in 2005. The new programmes based on constructivism have come to the fore as a significant development. Teachers' adaptation in this transitional process and their internalization of this new approach has been of the utmost importance for the success of the program. Difficulties faced by experienced primary school teachers in particular have become a serious matter that should be qualitatively addressed. It can be proposed that classroom management models and approaches used by teachers in traditional classroom settings will fall short of the needed classroom management where constructivism is adopted ad hoc. In the case of constructivism, learning settings are as essential as the teacher. Building on the views of the participating teachers, the aim of this study is to determine the characteristics of a classroom where constructive classroom management is practiced and how this differs from those where the traditional approach is adopted.

Method

A phenomenological research design (a qualitative research method) was employed in this study. A phenomenological research design focuses on the phenomena that we are aware of, but of which we do not have a detailed and exhaustive grasp of. Phenomenology provides the proper basis for studies intended to research the phenomena that we are familiar with but cannot thoroughly understand (Yıldırım & Şimşek, 2006, p.72). Classroom management as a concept is frequently used in relation to the education process, yet has changed due to the constructive practices put into effect in primary school programmes as of 2005. Therefore, a phenomenological research design provides suitable conditions for the analysis of classroom management based on a constructivist approach.

Data Collection and Analysis

Standardized open-ended interviews were used for the purpose of this study. This interview type comprises a series of meticulously written and ordered open-ended questions and each interviewee is asked the same question in the same order (Patton, 1987, as cited in Yıldırım & Şimşek, 2006, p.123). To achieve reliability, the interview form was scrutinized by three experts in education science and revised in line with their feedback. The study was administered among 175 primary school teachers working at public schools in Çanakkale. The criterion that participant teachers had begun working as teachers prior to 2000 was essential for the purpose of the study. There were four open-ended questions in the standardized open-ended interview form. The questions in the form were:

1) Do you think you are successful at classroom management? If yes, how; if no, why.
2) Can you compare and contrast your classroom management practices to the previous and present classroom management programmes? What are the differences?
3) What are the most disturbing student behaviours in your classroom management?
4) What solutions do you adopt for addressing the most disturbing student behaviours?

Descriptive data analysis was performed to analyse the data. In descriptive analysis, data can be ordered according to the themes revealed by the research questions, but also can be presented by considering the interview questions. In a descriptive analysis, quotes are typically used to effectively reflect the views of the interviewees (Yıldırım & Şimşek, 2006, p. 224). Moreover, to be able to increase reliability, the qualitative data were presented in the form of numbers, frequencies and percentages when calculating the interviewees' views.

Results

In this part of the study, the data obtained using the open-ended interview were descriptively analysed and presented and explained in tables. The findings were analysed according to four categories.

1) The reasons for why teachers considered themselves successful or unsuccessful at classroom management

Table 1 presents the frequencies and percentages concerning whether teachers considered themselves successful (or not) at classroom management.

Table 1. *Do teachers consider themselves successful at classroom management?*

	f	**%**
I am successful at classroom management	106	89.8
I am not successful at classroom management	12	10.2
Total	**118**	**100.00**

It is clear from Table 1 that 89.8% of teachers interviewed considered themselves successful at classroom management, while 10.2% did not. The reasons why teachers considered themselves successful at classroom management are provided in Table 2.

Table 2. *The reasons why teachers considered themselves successful at classroom management.*

Reasons why teachers considered themselves successful (n=106).	***f***	***%***
Being experienced	21	8.57
Close relationships with students	21	8.57
Caring about children	16	6.53
Having knowledge about children	12	4.90
Maintaining discipline	11	4.49
Mutual love	11	4.49
Speaking at students' level	10	4.08
Providing interesting in-class activities	9	3.67
Establishing rules with students	9	3.67
Self-improvement/keeping up-to-date	8	3.27
Being a graduate of primary school education	8	3.27
Implementing rules consistently	7	2.86
Creating a democratic classroom	7	2.86
Sympathizing	6	2.45
Gaining students' trust	6	2.45
Getting students involved in the class	6	2.45
Having preferred teaching as a job	5	2.04
Mutual respect	5	2.04

***Table 2 (Cont.)**. The reasons why teachers considered themselves successful at classroom management*

Reasons why teachers considered themselves successful (n=106).	***f***	***%***
Motivating students in the class	5	2.04
Being witty	5	2.04
Being tolerant	4	1.63
Enjoying your job	4	1.63
Students being able to express their thoughts freely	4	1.63
Accepting students as individuals	4	1.63
Using technology	4	1.63
Treating students equally	3	1.22
Being consistent	3	1.22
Making eye contact with students	3	1.22
Giving turns in activities	3	1.22
Providing activities when students are distracted	3	1.22
Views below 1%	22	9.02
Total	**245**	**100.00**

Table 2 shows that interviewees associated their success in classroom management with being very experienced (*f*= 21), close relationships with students (*f*= 21), caring about children (*f*= 16), mutual love (*f*= 11), having knowledge about children (*f*= 12), maintaining discipline (*f*= 11), speaking at students'' level (*f*= 10), establishing the rules with students (*f*= 9) and self-improvement (*f*= 8).

T34 explained the importance of enjoying classroom management in terms of human relations: "It starts with loving students. *As long as students understand that you love them, you will have no classroom management problems".*

T42 stated, "I owe my success to being experienced, knowing…my students, self-improvement [and being aware of students'] interests and needs."

T60 expressed the importance of establishing rules together with students as follows: "I set the rules of my class(room) together with my students. By giving examples, I explain [to] them [that anyone] can get upset sometimes if they disobey these rules. *If a student who has started their primary education in the last month can understand and manage to [follow] the rules, no problems show up later on."*

The reasons with the lowest frequency of success pertaining to teachers' classroom management accounted for less than 1% and referred to reasons such as imposing authority, giving responsibility, talking about the rationale behind the rules, leaving thoughts irrelevant to school outside the classroom, being a role model, empathizing with students, being a leader, being patient, being cheerful, being persuasive, not causing fear, praising the behaviour not the student, cooperating with the teachers, teaching through play, helping students internalize the rules, setting applicable rules and uncrowded classes.

The reasons why teachers considered themselves unsuccessful at classroom management are presented in Table 3.

Table 3 reveals that teachers considered themselves unsuccessful at classroom management primarily due to overcrowded classes (*f*= 5), not being authoritarian (*f*= 3) and overly active students (*f*= 2).

Table 3. *The reasons why teachers considered themselves unsuccessful at classroom management.*

Reasons why teachers considered themselves unsuccessful (n=12).	***f***	***%***
Overcrowded classes	5	33.33
Teacher not being authoritarian	3	20.00
Overly active students	2	13.33
Teacher being unable to impose the rules	1	6.67
Disobedient students	1	6.67
Class being used/attached to a previous teacher	1	6.67
Programme inappropriate for students' level	1	6.67
Spoiled students	1	6.67
Families incapable of providing proper education	1	6.67
Total	**15**	**100.00**

T85 stated, "I am not very successful [at classroom management largely due to] overcrowded classes and the fact that it is [difficult] to implement the new system in crowded classes, due to [spoiled] students and the fact that we are unable to impose the rules."

T120 stated, "I don't think I am successful [at classroom management]. *The reasons [for this] is my crowded class of 50 students. It is very difficult to implement the programme and thus to be successful."*

2) Teachers' comparisons between the old and new programmes in terms of classroom management

Table 4 shows the frequencies and percentages of the interviewees' answers to the question, "Can you compare and contrast your classroom management to the old and new education programmes and give reasons for your comparison?"

Table 4. *Teachers' comparisons between the old and new programme in terms of classroom management.*

	f	***%***
Classroom management was easier in the previous programme	36	45.56
Classroom management is easier in the new programme	28	35.44
Both programmes are the same in terms of classroom management	11	13.92
I cannot properly implement the new programme	4	5.06
Total	**79**	**100**

Among the interviewees, 45.57% (*f*= 36) of the teachers expressed that classroom management had been easier in the previous programme. The percentage of interviewees who thought classroom management was easier in the new programme (2005 primary school programme) was 35.44% (*f*= 28), while those who thought there was no difference between the two programmes accounted for 13.92% (*f*= 11); those who were unable to properly implement the new programme accounted for 5.06% (*f*= 4).

The views of the teachers who thought that classroom management had been easier in the previous programme are presented in Table 5.

Among the interviewees, 45.56% of teachers stressed that classroom management was more difficult in the new programme. They noted the primary reason for this difficulty (*f*= 16) being the fact that students are active and teachers passive in the new programme.

Table 5. *The reasons why classroom management was viewed as easier in the previous programme.*

Teacher views	Reasons	*f*	%
Classroom management was easier in the previous programme (*n*=36)	Because students are active and the teacher is passive in the new programme	16	35.56
	Because it is difficult to complete the activities of the new programme in crowded classes	8	17.78
	Because the previous programme was teacher-centred and the new one is student-centred	7	15.56
	Because there are too many activities in the new programme	7	15.56
	Because it (the new programme) has a different sense of discipline	2	4.44
	Because the new programme requires collaboration with parents	2	4.44
	Because whatever the teacher says was considered acceptable in the previous programme	1	2.22
	Because communication skills are highlighted in the new programme	2	4.44
	Total	**45**	**100.00**

Other reasons included the difficulty of completing the activities of the new programme in crowded classes (*f*= 8), the student-centred nature of the new programme (*f*= 7) and the excessive amount of activities in the new programme (*f*= 7). Among the other reasons why teachers considered classroom management difficult to achieve in the new programme was its different sense of discipline (*f*= 2), the necessity for collaborating with parents (*f*= 2), communication skills being highlighted in the new programme (*f*= 2), the fact that any statement made by teachers had been considered acceptable beyond question in the previous programme (*f*= 1).

T7 explained the difficulty of classroom management in the new programme as follows: "*Classroom management was easier in the previous programme. Everything was done by the teacher. I used to teach the class and tell them 'write, draw and listen', which made it easier. Now students are more active. While managing [students] doing the activity, I have to check [on the students observing] them. One needs to be more careful...*"

The reasons given by teachers who thought that classroom management was easier in the new programme are presented in Table 6.

Among the interviewees, 35.44% of teachers expressed that classroom management was much easier in the new programme. Table 6 shows that teachers were of the opinion that students being active thanks to the new programme as the primary reason for why students were not bored (*f*= 13). As clearly indicated by Table 6, the interviewees thought that classroom management was easier in the new programme because it is student-centred (*f*= 5), classrooms are equipped with technological devices (*f*= 3), students are given responsibilities (*f*=3), it creates a more democratic environment (*f*= 3), teachers guide the students (*f*= 2), teacher-student communication is very strong (*f*= 2) and classes are taught using activities and play (*f*= 1).

T23 claimed that "*classroom management was more difficult [when] implementing the new programme. The students who had to listen to…what I told [them] (as passive receivers) used to get bored. They used to easily get distracted and accordingly, it used to [be more difficult] to manage the classroom...*"

Table 6. *The reasons why classroom management was thought to have been easier in the new programme.*

		f	%
Classroom management is easier in the new programme (*n*=28)	Students do not get bored because they are active thanks to the new programme	13	40.63
	Because the new programme is student-centred	5	15.63
	Because classes are given using technological equipment in the new programme	3	9.38
	Because students are given responsibilities in the new programme	3	9.38
	Because there is a more democratic environment in the new programme	3	9.38
	Because teachers guide the students in the new programme	2	6.25
	Because the new programme improves teacher-student communication	2	6.25
	Because classes are taught using activities and play	1	3.13
	Total	**32**	**100.00**

T44 stated that "*because I guide them, [students] are in the foreground now. Because they are supposed to actively participate in the class in the new programme, this…made my job very easy..."* T44 here refers to the fact that active participation is of great importance for classroom management.

3) Student behaviours that disturb teachers the most while managing the classroom

The frequencies and percentages pertaining to teachers' answers to the question "which student behaviours disturb you the most?" are provided in Table 7.

According to Table 7, the most disturbing behaviour for teachers are students fighting with one another and using inappropriate language (*f*= 31), behaving in a way that disturbs the class (*f*= 30), talking to one another during class (*f*= 28), not paying attention in class (*f*= 26), doing irrelevant things (*f*= 21) and talking without taking turns (*f*= 16). Other disturbing behaviours include students displaying disrespectful behaviours (*f*= 13), telling lies (*f*= 6) and disobeying the rules (*f*= 5).

T106 expressed *"[students] talking without taking turns and being disrespectful to one another"* to be disturbing.

T192 described disturbing behaviours as, *"disrupting the class, bothering [a] friend [and] playing with tool, such as[a] pencil [etc.]."*

T64 stated that families have an impact on students' behaviour and claimed that *"Parents are overprotective. Teachers have no authority over students. This makes children spoiled."*

Table 7. *Student behaviours that disturb teachers the most while managing the classroom.*

Student behaviours	*f*	%
Fighting with one another and saying bad words	31	13.90
Behaving in a way that disturbs the class	30	13.45
Talking to one another during class	28	12.56
Not paying attention in class	26	11.66
Doing irrelevant things in class	21	9.42
Talking without taking turns	16	7.17

Table 7. (Cont.) *Student behaviours that disturb teachers the most while managing the classroom.*

Students not doing their homework and not fulfilling responsibilities	**13**	**5.83**
Displaying disrespectful behaviour	13	5.83
Being indifferent to the class	9	4.04
Telling lies	6	2.69
Being unprepared for class	5	2.24
Disobeying the rules	5	2.24
Not being active	4	1.79
Being careless	3	1.35
Frequently leaving the class to go to the restroom	3	1.35
Being late for class	2	0.90
Making fun of/belittling the teacher	2	0.90
Being spoiled	2	0.90
Trying to solve class-related problems with the family	2	0.90
Unhelpful families	1	0.45
Being a misfit	1	0.45
Total	**223**	**100.00**

T122 explained disturbing behaviours as follows: *"Students speaking [during] the course of the class and doing irrelevant things, which frustrates [teachers, including myself]."*

T195 described upsetting behaviours as follows: *"Students hurting [one another] is very sad. Of course, I [get] annoyed when they do not do their homework [or] fulfil their responsibilities..."*

4) Solutions to student behaviours that disturb teachers the most while managing the classroom

The frequencies and percentages concerning teachers' answers to the question "what are your solutions to the most disturbing behaviours while managing the classroom?" are presented in Table 8.

Table 8. *Solutions to student behaviours that disturb teachers the most while managing the classroom*

Solutions	***f***	**%**
I warn the student	37	18.78
I punish the student	21	10.66
I make the class more enjoyable by using various activities	20	10.15
I talk to the students' parents	19	9.64
I talk to the student in person	17	8.63
I explain what the consequences of misbehaving will be	14	7.11
I give students a turn/responsibility	14	7.11
I try to find the causes of misbehaving	9	4.57
I consult the school counsellor	8	4.06
I ask how the student would feel if the same was done to him/her	8	4.06
I make eye contact with the student	6	3.05
I wait quietly for the student to understand what they have done	6	3.05
I raise my voice when teaching	5	2.54
I give students turns in activities	4	2.03
I reward desirable behaviour	4	2.03
I relocate them to another desk	3	1.52
I encourage students to apologize when/if they misbehave	2	1.02
Total	**197**	**100.00**

The analysis of the solutions that teachers preferred in order to cope with undesirable behaviours revealed that the most preferred solutions were warning students (*f*= 37), punishment (*f*= 21), making the class more fun by using various activities (*f*=20), talking to students parents (*f*= 19) and talking to the student in person (*f*= 17).

T158 attempted to address behavioural problems by *"warning [students], explaining [that] what [they had done] was wrong. If [the student still…misbehaves], I talk to [their] parents."*

T183 stated, *"I try to solve such problems by warning [students]. But if [they are] persistent, I make [them] wait outside [the classroom] as a punishment."*

Conclusion, Discussion and Suggestions

In consideration of the results of this study, which was aimed at describing the views of primary school teachers on constructive classroom management, it is concluded that 89.8% of the teachers interviewed considered themselves successful at classroom management, while the remaining 10.2% believed themselves to be unsuccessful. The major reasons for participant teachers to consider themselves successful included being experienced, having good communication with the students, caring about children, mutual love, having knowledge about children, maintaining discipline, speaking at students' level, setting the rules together with students and self-improvement. Among the reasons why teachers believed themselves to be unsuccessful at classroom management were overcrowded classes, teachers not being authoritarian enough and students being active.

The comparisons by participant teachers between the previous and the new programme showed that 45.56% of the teachers believed classroom management to have been easier in the pre-2005 programme, while 35.44% believed it to be easier according to the 2005 primary school programme. Furthermore, 13.92% expressed that there was no difference between the two programmes and 5.06% claimed that the new programme has not yet been properly executed. Teachers supporting the notion that classroom management had been easier in the previous programme listed the reasons for saying so by asserting that students are active in the new programme, whereas teachers are passive; they stated that it was difficult to complete the activities of the new programme in a crowded class, that the programme is student-centred and that the presence of activities in the new programme renders classroom management more demanding. Çelik-Şen and Şahin-Taşkın (2010) suggest that the number of in-class activities have increased with the advent of the new programme, affecting classroom organization. This overlaps with the present study's result that classroom management has become more difficult due to problems posed by crowded classes. In the study "The Effects of Class Size on 2005 Elementary School Curriculums' Success" conducted by Alaçam and Demir (2013), it was found that teachers with a class size of 41 or more students stated that class sizes have more negative effects on the success of 2005 primary school curricula when compared to teachers with a class size of 25-40. According to Bedir (2015)'s research, primary and secondary school teachers feel the most efficient on classroom management in constructivist approach.

The interviewees believed that classroom management was easier in the new programme because students are more active in the new programme, the program is student-centred, classrooms are equipped with technological devices, students are given responsibilities, the programme creates a more democratic environment, teachers guide the students, teacher-student communication is very strong and classes are taught using activities and play. It is inferred from research by Çandar and Şahin (2013) that undesirable behaviours such as irrelevant talking, disrespectful behaviours in informal classroom settings, uncontrollable behaviours due to the leniency of the teacher – as well

as behaviours that need to be handled correctly in order to reinstate classroom order – are being observed more often than in the past. This indicates that teachers who base their classes on constructivism need to develop advanced competencies for creating, preserving, sustaining and restoring order within the classroom environment.

According to the results of the current study, the most disturbing student behaviours are: fighting between students, using bad words, misbehaving in such a way as to disrupt the class, talking to one another, being indifferent to the class, doing irrelevant things in class, talking without taking a turn, disrespectful behaviours, telling lies and disobeying rules. The literature review revealed that the findings of the present research are partially consistent with those of other studies. The study by Çankaya (2011) shows that indifference to the class, cheating, physical and verbal abuse, disrespect the teacher, not taking responsibility, disrupting the class and student cliques are frequently encountered as problematic and undesirable behaviours. Siyez (2009) discovered that the undesirable behaviours most frequently encountered by teachers are: not paying attention in class, failure to fulfil class-related responsibilities, talking without taking a turn and disrupting the class.

The analysis of the solutions that teachers preferred to use in order to cope with undesirable behaviours revealed that the most preferred solutions were giving students a warning, punishment, making the class more fun by using various activities, talking to parents and talking to the student in person. Interestingly, consulting the school counselling office about students displaying undesirable behaviours was a less often mentioned solution. According to Çankaya (2011), the solutions teachers prefer in order to cope with unwanted behaviours include short- and long-term solutions such as guiding/counselling students, making them face up to what they have done, helping them take responsibility, punishment, rewards and social support. Siyez (2009) states that teachers who encounter unwanted student behaviours adopt appropriate approaches such as trying to understand the cause(s) of the misbehaviour, talking to the student in person, warning them about their misbehaviour, as well as inappropriate reactions such as shouting, punishment and opting to send the student to the counsellor's office. The findings of the present research overlap with these findings.

The present study revealed that further research is required to investigate phenomena such as codes of conduct and undesirable behaviours and related strategies. In particular, it is suggested that the class environment can be observed in social studies, science and technology classes. The 2005 primary school curriculum based on constructivism has changed the teacher's role in terms of classroom management. Therefore, more functional in-service training should be offered in order for teachers to broaden their knowledge about activity-based constructive classroom management. This study included primary school teachers as a research sample. Similar studies carried out involving secondary and subject-matter teachers are expected to contribute to the field.

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Supporting School Counseling in Belize: Establishing a Middle School Career Development Program

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Abstract

Within the education field, international partnerships to address career development have been successful around the world (Brown, Bim Rose, & Hughes, 2005; Nazali, 2007; Prideaux, Patton, & Creed, 2002; Repetto, 2001). Career development programming impacts the educational development for children and adolescents (Gottfredson, 1981; Gottfredson & Lapan, 1997; NCDA, 2011). School Counselors are often an untapped resource in the schools to design, implement and evaluate school-wide programs centered on career development. This article explores the benefits of career development and the creation of a career development school-wide program for the 6th grade level in Belize. This is accomplished through an international partnership between the Ministry of Education in Belize and a University in the Northeastern United States. This article explains the school counselors role as well as best practices for international partnerships when creating a full-year, school-wide career program at the middle school level in Belize.

Keywords: Career development, Primary school, Career counseling

Introduction

Academic development in school for children and adolescents is a universal goal throughout the world. Educational literature explains how learners, regardless of country and culture, are not one-dimensional, thus a holistic approach to education has positive impacts (Oser, Beck, Alvarado, & Pang, 2014; Snyder, Vuchinich, Acock, Washburn, & Flay, 2012). Adjusting to meet the developmental levels of the students and address the schools' culture and community are critical steps at all grade levels.

Significant efforts have been seen in the United States to implement career-based developmental programming that will inform the whole child at the primary and secondary school levels (Coogan, Neary & Evans, 2014; Gottfredson, 1981; Gottfredson & Lapan, 1997; Gysbers, 2005). The general goals of these programs are to help inform the children (and their parents) and begin establishing skills, attitudes, and knowledge for transition into the workforce. Efforts are also seen in Ireland evidenced by the Transition Year Programme first implemented in 1974 that focuses on career and workforce

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readiness at the secondary school level (Moynihan, 2015). Although these two countries offer comprehensive examples that could be replicated, the reality is that most countries do not focus on career development as a part of the primary education training. However, considering the twenty-first century global economy demands a variety of skills that are evolving and growing as new technology surfaces impacting the workforce, preparing our students as early as the primary levels can be beneficial across many levels. For many developing countries there is a heightened focus on career development for children and adolescents because of the potential impact on the labor market (Watts & Fretwell, 2004; Richard, 2005). The literature has supported the positive implications intentional career programming can have on occupational aspirations for decades (Gottfredson, 1981; Gottfredson & Lapan, 1997; Gysbers, 2005; Moynihan, 2015; Nazli, 2007; Rowan-Kenyon , Perna, & Swan, 2011).

Exposure and awareness are the key goals for career development among children and adolescents (Andersen & Vandehey, 2012; Gysbers, 2005; NCDA Guidelines, 2011). Implementing a career development program at the primary school level provides the children with more time to practice critical transferable skills that are expected and required for success across any occupation in the 21st century global economy. Transferable skills such as communication (written and verbal) that infuses technology (e.g., emailing; and using power points for presentations) (Moynihan, 2015); problem-solving skills and critical thinking that infuses both analytical and global thinking are all required in this fluctuating labor market.

Many schools, especially in the United States, at the primary and secondary levels already have a key resource to successfully assess for the needs, implement, and evaluate the career development program that is best suited for their school. This resource is the School Counselor; a master's level and state-licensed professional counselor who is trained in academic, career, and social-emotional development for children and adolescents as well as research, program creation and evaluation and various forms of delivery counseling services (e.g, individual, small group, large group), (ASCA, 2012).

Understanding the School Counselor's Role

The School Counselor is a support service personnel employed in the primary and secondary schools. Some countries refer to this role as a "Guidance Counselor". Since the early 1900's, there was a direct focus on vocational counseling, and some efforts to impact the public school sectors (Coogan, 2014). However, there were no positions in the schools at that time that parallel the focus of responsibilities of the school counselor. The concept of vocational counseling was being fine-tuned, and the schools that provided this service to their students were calling on Teachers or Administrators to add extra duties to their positions (Gysbers, 2005). As an ancillary position, not all students had access to vocational counseling services.

The Vocational Guidance Counselors' role was formalized and funded in the United States as a standalone position in the middle and high school levels as a result of the 1958 National Defense Education Act (NDEA). These counselors focused on academic and career development, with particular attention paid to identifying students who had aptitudes in math and science as a strategy to help the country remain competitive during the "race to space" (Coogan, 2014; Jolly & Kettler, 2008). In the first few decades, the student needs and the position evolved encompassing more responsibilities and duties that would impact child development. In addition to support for identifying gifted and talented children (Jolly & Kettler, 2008), another outcome from the NDEA in American Education was the establishment of the Vocational School Counselor. The role evolved into a stand-alone position in the schools quickly, and a chartered professional organization was

formed in the mid-1950's as well, the American School Counseling Association [ASCA]. A few decades later, ASCA sought to re-name this critical support role in the school understanding the holistic and vastly comprehensive skill set this role utilized on a daily basis; thus, the title of the role was changed to the Professional School Counselor. Today, the shortened title commonly used is the School Counselor.

There are several barriers to academic success challenging students across the world. Some barriers are environmental (e.g., the student and his/her family are homeless, or perhaps there are unsafe or unsuitable living conditions for the child). Other barriers are mental, including various challenges with learning, development or the student is a gifted and talented learner. Sadly, many schools across the country are not equipped to support the needs of gifted and talented students (Jolley & Kettler, 2008). There are also emotional barriers due to developmental or biological factors if a child struggles with emotional regulation, coping skills and overall wellness and self-care. Any of these examples are within the scope of the training of the twenty-first century school counselor. School counselors can help children and their families to identify different types of barriers, design a specific plan for that student based on their needs and abilities, and provide continued support so that the child has the opportunity to be a successful learner.

As a key resource for American schools, the school counselor is someone students, families, teachers and administers can rely on to address barriers along with academic and career development needs. In many countries, however, this role does not exist or, the job responsibilities are very different than how the role is performed in the United States. When there are limited or no School Counselors, programming and evaluation needs often fall on the building administrators or teachers. This is seen often in third-world countries where resources and personnel are already limited.

In Belize, the role of the School Counselor is a newer role to the educational system (Smith-Augustine & Wagner, 2012). Within the founding group of school counselors in Belize, the majority do not have the formal training in line with various standing and accrediting bodies such as: the U.S. National Board of Certified Counselors (NBCC), the U.S. Council for Accreditation of Counseling and Educational Related Programs (CACREP), and the American School Counseling Association (ASCA). However, the Belize School Counselors Association (BSCA) continues to grow and advocate to add positions for school counselors across all grade levels in primary and secondary schools throughout the country (Smith-Augustine & Wagner, 2012). As the country of Belize continues to expand their educational support personnel by adding School Counselors to the primary and secondary levels, additional programming and evaluation will be possible to support and implement.

Collaborative partnerships are one mechanism that can be used to create and implement career development programming across all school levels. Implications for such partnerships can directly impact the local workforce in a country exposing students to career available in their own backyard at an early age. Waiting until high school is not necessary and hinders the career development process. Focusing on programming at the elementary and middle school levels with a developmental lens contributes to the increased self-efficacy, self-concept and self-esteem of the child (Anderson & Vandehey, 2012; Hutchins & Akos, 2013).

Identified Career Development Needs in Belize

The Ministry of Education in Belize is the government agency that oversees all education for the country. In May, 2013 the Ministry of Education in Belize conducted an internal review of their educational systems. One of the areas of exploration was looking at career development and career decision-making among the youth. A report was published by the

Inter-American Development Bank for the Ministry of Education in Belize focused on these concerns. It recognized recent efforts by the country to invest in their educational system; however, the access to education, quality of education and the equity of education throughout the country still showed much needed improvement (Naslund-Hadley, Alonzo, & Martin, 2013). One cause for concern was the alarming drop-out rates between primary and secondary where more than half of Belize's students choose to leave schooling after Standard 6, the United States equivalent of eighth grade (Nasulnd-Hadley, et al., 2013). The outcomes from this report prompted exploration of the glaring question, "What factors are contributing to the current retention issues seen among the middle school level?" Upon closer examination it appeared that there was no career development program in existence in any of the primary schools. Based in part on the success seen in the United States, Belize sought to create a career development program for their middle school level as a developmental prevention strategy to address the current retention issues. The method to accomplish this goal would call upon an existing partnership with the Ministry of Education and a University in the Northeastern United States.

The primary goals of this partnership were to specifically address significant retention issues that had been observed in Belize throughout the middle school level. It was noted that the highest dropout rates were seen among the equivalent of eighth grade. In Belize, this is a natural transition point in the educational process. Creating a program to inform career development awareness, knowledge, and practice among the middle-school aged students is predicted to have a significant impact on career decision-making. The following describes the environmental factors that informed the need in Belize as well as the process to create a school-based career development program through an international collaborative effort. It is the hope of this author that this article may serve as a "how-to" guide to create a school-wide career development program and encourage collaboration at the international level.

The team formed to create the school-based career program and address the retention issues noted at the middle school level included: a School Counselor Educator from the Northeastern University in the United States who specializes in school counseling training and career development; a Career Counselor from the same University who specialized in career counseling and career assessment; representatives in Belize from the Ministry of Education, the Belize Counseling and Care Unit, and target schools' administration and teachers. The objective of this team during the first year was to create a full-year career development program that could be implemented in identified target schools throughout Belize in the first year as a pilot test. Based on those results, any modifications identified would be made, and the program would be available for implementation country-wide.

Belize's Geographic Background. Belize is a small country located on the eastern coast in the heart of Central America. It is the only country in Central America whose official language is English, though Belizean Creole and Spanish are also commonly spoken. Belize is bordered on the north by Mexico, on the south and west by Guatemala, and on the east by the Caribbean Sea. According to a country profile report conducted by the United Nations Educational, Scientific, and Cultural Organization (UNESCO, 2014), in 2013 the country's population was approximately 332,000 with 34% of this total population representing children ages 14 years and younger. In 2010, more than 90,000 students were enrolled in Belize schools and colleges at all levels, including almost 4,000 in preschools, 63,000 in primary schools, and more than 15,000 in high schools. Close to 6,000 students were in post-secondary studies. Additionally, 55% of the total population in Belize lives in a rural geographic area (UNESCO, 2014), which is also informed by the primary areas of the Belizean labor market. According to the Belize 2010 census, the five main ethnic groups, in order of proportion, are: Mestizo representing approximately half

of the population in the country (the result of the mixture between colonial Hispanics and Maya); Creole representing approximately 21% of the population (the result of the mixture between the British and their African slaves); Maya representing about 10% of the population (made up of three linguistic groups); Garifuna representing approximately 5% of the population (originally from St Vincent where maroon African slaves blended with Amerindians); and, Mennonites representing approximately 4% of the population (originally from Germany via Mexico) (Palacio, 2013).

Belize's Labor Market and Economy. The economy is primarily based on agriculture, tourism, and services. The primary exports are citrus, sugar, and bananas. In 2013, (UNESCO, 2014) estimated that 41% of the population lived below the poverty line. As a part of the Belizean Labor Act, the general minimum age of employment is reported to be 12 years-old. In 2013, The United States Department of Labor Bureau of International Labor Affairs published a report stating how children in Belize are an active part of the labor market, and nearly 9% of children between the ages of 7-14 are going to school and also working in the agriculture industry or street peddling merchandise before or after school (UNESCO, 2014). This is considered to be a primary factor for the retention issues that were noted in the Inter-American Development Bank report of 2013.

Belize's Educational System. Compulsory education defines the specific age span during which children are legally obliged to attend school. In Belize, compulsory education lasts eight years and spans ages 5-12 (UNESCO, 2014). It may be better understood why the minimum age of employment is 12 when this is noted as the same age where education is no longer legally required. In recent years, there has been a steady increase in the overall percentage of students enrolling in primary school. In 2004, 96.4% of the total numbers of students at the primary school age were enrolled at that level (UNESCO, 2014). While this percentage fluctuated slightly over the years for the primary school level, it has remained mostly consistent at 96.6% in 2013 (UNESCO, 2014). It is likely the various efforts by the Ministry of Education in recent years to support education have had a direct effect on the increase noted in primary school enrollment.

In Belize, education is managed jointly by church and state. This merger is a part of the country's history as a British Colony. As such, it is not surprising to learn the parochial and catholic schools are considered to be the best throughout primary and secondary levels (UNESCO, 2014).

The grading system in the schools is mixed. Some schools follow the Kindergarten – 12th as is custom in the United States. In these schools, the typical school year will begin in September and end in June (UNESCO, 2014). Schools that do not follow this format, will refer to each grade level as a "standard," a model more in line with the British educational system. Students will begin at the grade level known as standard 1 (the equivalent of Kindergarten in the American system). Their primary schooling will continue through standard 6 (the equivalent of 8th grade in the American system). Secondary school, also known in the United States as high school, may or may not be a catholic school. The best schools are often found in Belize City and in larger towns because of the availability and access to various resources including but not limited to: personnel, supplies, and typically larger populations which means more students enrolled in the schools. Many of the schools lacking in resources appear to be in the rural areas of the country, often in the south.

There are several possible reasons that contribute to a child ending their educational career at such a young age of 12 in Belize. One reason can be informed by financial burdens felt by the families as the cost of schooling will increase exponentially as secondary school and additional education is no longer free. Even if a family is among the

fortunate to receive tuition subsidies offered by the government, this support is intended for compulsory education. For families who are not part of this program during compulsory age, the education tuition can be an additional expense that while likely seen as a value within the family, it still is a burden on the family budget.

A second reason is that several children may be dropping out is due to opportunities other than school. Some students are struggling in certain areas of the country with safety matters and may join gangs for reasons of perceived assistance the gang says they can provide, or because that gang may provide the child with a sense of community they are not able to achieve in another outlet (Dugal, 2015; Peirce & Veyrat-Pontet, 2013). And, still others are asked to contribute to the family income by entering the workforce as a child. One example of this may been seen in large tourist areas where the children work as street peddlers selling various goods made by the families. Another example may be seen among families that are heavily involved in the agricultural sector, and may require the assistance of the child to continue meeting productivity goals.

Educator Training. Examining the field of education in Belize, we see there is no requirement of a higher education degree in Belize to be a primary or secondary school teacher (Lindhauer, 2014; Nasulnd-Hadley, et al., 2013). Furthermore, there is no license of minimum subject matter knowledge or other competencies regulated by the Ministry of Education, as we see in every state Department of Education across the United States. In 2013, approximately forty percent of Belizean teachers instructing at the high school level had received only a high school education themselves (Nasulnd-Hadley, et al., 2013). When looking more closely at all educators across Belize, it appears that approximately 70% of all teachers regardless of subject area or grade level are professionally trained (Lindhauer, 2014; Nasulnd-Hadley, et al., 2013). One effort the Ministry of Education implemented to work to address this was through a recent amendments to the Education Act of 2010 that seeks to have all teachers professionally trained as a requirement to obtain a teacher's license (Dugal, 2015; Lindhauer, 2014; Naslund-Hadley, et al., 2013).

Many state Department of Educations within the United States all have minimum requirements for education curriculums outlining benchmark standards the students must demonstrate competencies in. Currently, this is the direction that the Ministry of Education is working towards to provide minimum levels of knowledge and competencies in education through a country-wide curriculum. One goal for this program is to contribute to these efforts focusing on the career development of the young adolescent and through a developmental lens, help to inform career aptitude and knowledge such that the student may reconsider their perspective on continuing to high school, and possibly higher education.

A Model Career Development Program in Middle School

Focused on addressing career development needs among middle school (7th grade specifically) in the American system, Starr and Gysbers (1992) created the Career Horizons Program as a prevention tool in the schools. The School Counselor was identified in this program as the best resource to deliver and evaluate the effectiveness of this program in the schools. Given the training that school counselors have across academic, career and social/emotional development among children and adolescents (ASCA, 2012) this is a perfect fit. While the foundational assumptions made to determine the need of the Career Horizons Program match the circumstances that the author was presented with, the international factor would not allow for the program to be directly transferred into the Belize schools. Therefore, the author and her team created a new program predicated on the parallel assumption that career-development is a life-long process that grows with experiences and intentional focus. Furthermore, at the middle school ages, the main goal is

career exposure and assisting the students to develop the necessary self-skills that will support their on-going self-reflection and self-awareness, which will be required for effective career decision-making when the developmental time comes. In addition to the normative developmental needs of career development, the growth process may vary greatly based on cultural and economic factors. This is seen clearly when considering the limited career development opportunities and development available for the middle school equivalents in the country of Belize.

The Belize Career Development Program for 6th Graders

The initial project plan was formulated based on the Inter-American Development Bank report of 2013, consultation with the Ministry of Education and the local Belizean team assisting with this project, and a field observation conducted by the primary author of the program in April of 2013 to complete an informal needs assessment. The Starr and Gysbers (1992) " Career Horizons Program" was also referred to as an example of a model program. Taking the information from these sources, a pilot program was created.

Members of the local team in Belize mainly worked in Belize City for the Ministry of Education or the Ministry's subdivision referred to as the Counseling and Care Unit. The Counseling and Care Unit provides counseling and related educational support services to schools throughout the program. There were four full-time members of the Unit at the time of this project who had divided the country into sections that they were each responsible for. Upon a closer look, it appeared a lot of the work in the schools performed by these individuals mirrors the work of both the School Social Worker and the School Counselor seen in the American primary and secondary educational system.

The team identified overall goals to help direct their efforts during the first year that included: (a) creation of a full-year career development program that would include six modules for implantation monthly throughout the school year by a classroom teacher who may not have had any formal training in career development or assessment/program evaluation; (b) prepare all associated assessment tools that will be used in specific modules; (c) prepare all associated assessment tools that will be used to determine the overall effectiveness of the program during its initial year of implementation, (d) create a supplemental training manual for the teachers that outlined strategies for effective implementation and student-centered teaching techniques.to support the teachers as they will be the personnel in the school administering this program, and (e) educate and support the Ministry of Education in Belize to understand how School Counselors can be a helpful and critical resource to addressing career development, social-emotional and academic needs of students across all grade levels, thus advocating for the hiring of more School Counselors country wide. Following the first year, the team would reevaluate the aforementioned goals and curriculum to identify any necessary modifications to the program, implementation, or evaluation steps in preparation for dissemination throughout the country.

The program, assessment tools, and the supplemental teachers' manual were created with the understanding that the primary role working with this program will be the classroom teacher. While the ideal is that School Counselors administer and evaluate the program, there are simply not enough School Counselors in Belize at this time to support that being an active role with this program. One hope is that through the evaluation procedures, the teachers and the local Belize team will have evidence to present to the Ministry of Education and the local University to support continued investment to grow the role of the School Counselor in the primary and secondary schools as well as establish degree granting graduate programs to provide the adequate training. The teacher's manual that was created was intended to provide the classroom teachers with

comprehensive supplemental information to support their success as a key administrator of this curriculum and program in the general areas of teacher education training, classroom management, differentiated learning, program and curriculum development and evaluation. As the program grows, modifications may be made to the manual accordingly. The ultimate goal is to expand the program country-wide. Therefore, in addition to the creation of the curriculum, the team sought to secure additional financial support to create a kit of supplies that would contain all materials needed for every curriculum (e.g., crayons, paper, chalk, string, etc.). The curriculum was created during the 2013-2014 academic year for the implementation at the start of the 2014-2015 academic year.

If the opportunity to continue education beyond the 8th grade is presented, clarified and benefits stated that directly inform this population, the potential impact could be great for the individual student, their family, the community where they live, and ultimately, the country's labor market. A fundamental assumption of this project is that if the schools are able to (a) provide information through intentional psychoeducational programming to children earlier in their educational career, and (b) identify students who are considered to be "at-risk" of dropping out earlier, than those children may choose an alternative path way for their career and educational future.

Students may be deemed "at-risk" for reasons beyond intellectual and scholastic abilities. Other external factors such as, but not limited to: parental involvement, socioeconomic status, family dynamics, ethnicity, gender, and geographic limitations to access education may also be contributing facts. One result of external factors that impede children's career development is the construct coined by Gottfredson of circumscription, the process by which children will almost unconsciously narrow their definitions of acceptable and unacceptable adult work roles, thus narrowing the scope of what occupations are attainable or even possible for them to consider (1981; Gottfredson, 2002; Gottfredson & Lapan, 1997). A similar construct she proposed is that of compromise (Gottfredson, 1981; Gottfredson & Lapan, 1997), where the child will make adaptations and modify their ideals related to the world of work.

The final product that was created over the course of one academic year included six modules designed for the 6th grade level to be completed over the span of an academic year. The five parochial schools that were identified for the pilot year followed the American education system academic calendar. It was assumed, as is in the United States, the first month (September) would be busy with various administrative tasks to start the school year. As such, the first module would not be administered until October, and would continue through April. May is noted as a "celebration" of completing the program, recommending parents and family join at the school on a designated time and date to celebrate the work and growth accomplished by the students throughout the year. With the support of their building principal, the curriculum asks classroom teachers for 90-minutes one day per month to implement the lesson for that module. Actively involving the building administrator serves as a secondary on-site support for the teacher and also can assist to identify the best day in each month so that the curriculum can be administered as consistently across all students in the 6th grade level. A calendar with a recommended timeline for administering the modules was provided. At the end of the academic year, the students would have a completed binder with various pieces of evidence of their hard work and dedication to the activities.

This 6th grade curriculum was designed to provide the foundational skills that will not only help the students to inform their career exploration and career decision-making, but also provide them with transferable learning skills that contribute to being a citizen of the world. The first module provides an overview and defines career awareness and is focused

more on career exposure. The second module centers on strategies for effective communication with teachers, parents, and other adults as the child seeks to apply critical thinking and continue engaging in the career exploration process. The third module centers on academic goal setting differentiating between short-term and long-term goals, and providing strategies for adaptive goal setting. The fourth module centers on adaptive study skills and habits, which are considered to be transferable skills in school as well as in the workforce. No matter which career field a student may chose, there are expectations of the individual to prepare and accomplish tasks assigned. Study skills and habits may directly impact the students' current role as a student, but what they learn and the self-efficacy established will impact them later in life as well. The fifth module was broken into two sections that begins to integrate the skills and practice from the earlier modules. In this module, students will focus on self-awareness and self-exploration that inform career explorations and their individual career development. This is the module where the transition from exploration to individual ownership of their career goals and interests are defined. Finally, the sixth module culminates with the student successfully identifying three (3) careers that are of interest to him or her. They are able to articulate why that career is of interest directly connecting the rationale to elements learned during the self-awareness and career self-discovery process. All modules have activities and assessments included so that the teacher can monitor progress of each student. All activities and assessments are collected in a binder for each student. At the end of the year, this binder may be displayed as evidence of the career exploration journey the student had just completed. The data collected from the assessments will be shared with the local project team, who can then work with the larger project team to complete the overall program evaluation analysis. The overall project team is responsible for creating the report shared with various stakeholders as well as providing any recommendations for growing the program.

Ideas brainstormed for future plans include, but are not limited to: (a) developing a formal teacher training program (e.g., professional development opportunity available even if the program is not being implemented) to better prepare and assist classroom teachers who may not have had formal training as a teacher educator with critical skills such as classroom management, differentiated learning, and empowering autonomous learning at developmentally appropriate levels; (b) creation of electronic resources (e.g., DVD's and the DVD players) to facilitate modules and lessons, which may relieve some teachers who may not be as familiar with the content being discussed in the lesson; (c) working to secure program investors or other financial support so that comprehensive kits and all relevant supplies can be provided to every student at each school that participates in the program; (d) expanding the program to add curriculums for the 7th and 8th grade levels building upon the learning from the previous year; (e) begin to infuse parent involvement as a part of the career exploration journey in a more direct way as there is a possibility that many parents may not have had formal career guidance; and, (f) continue to create or modify assessment tools enhancing the outcomes-based approach for this program.

Conclusion

Career development is an important aspect of the developmental process that is often overshadowed by academic goals and outcomes in schools world-wide. While the question "what do you want to be when you grow up?" is common place is many countries, the actual supports that are in place to guide a student through the career exploration process earlier on in their lives are not as strong as they can be. The primary and secondary schools are able to implement different programming and curriculums to address this need. The School Counselor is the primary resource in the school poised to address all

elements as well from identifying the unique needs within a school, district, or a community to creating and designing intentional programming that best meets the identified needs to collecting evaluative data on whatever delivery system and plan is created to have empirical evidence available to support the effectiveness of their efforts. While the School Counselor is not a common place role in all schools in all countries, education systems and countries are encouraged to consider adding more counselors to the permanent staff across all grade levels. The breadth of services the School Counselor is trained for supports the holistic student across their primary and secondary educational career.

There are many opportunities throughout childhood and adolescence for adaptive and meaningful career development to take place regardless of the individual's country of origin. While not all countries have the same systems and resources available to support various elements of learning, we can capitalize on intentional partnerships to provide necessary supports. Whether the support needed is a consultation, expertise to complete a needs assessment, or it is an intervention to address an identified need, international partnerships are attainable and productive strategies in this 21st century global economy.

Schools, districts, communities and countries will have needs that cannot always be addressed with the local resources. This is when partnerships can be a helpful approach to meeting identified needs be they local, national, or international collaborations. This article showcases the benefits and success to address identified needs by the Ministry of Education in Belize and a University in Northeastern United States. Regardless if the reason for the partnership is based on the content area or a lack in resources to accomplish the identified task, collaborative partnerships is a helpful method. This is enhanced when the partnership is able to cross borders and support different cultures, communities, and labor markets; especially given our 21st century global economy. The success from one country can have an impact on the world.

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The Investigation of the Level of Self-Directed Learning Readiness According to the Locus of Control and Personality Traits of Preschool Teacher Candidates

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Abstract

The aim of this study is to investigate the relationship between the level of self-directed learning readiness, locus of control and the personality traits of preschool teacher candidates. The survey method was used for this study. The study group consisted of 151 teacher candidates who volunteered to participate in the study from Preschool Education department at Atatürk Faculty of Education, Marmara University. A Demographic Form, Self-Directed Learning Readiness Scale, The Big Five Inventory and Locus of Control Scale were used as the data collection tools. The results of the study indicated that there is a significant relationship between the level of self-directed learning readiness, "extraversion" and "conscientiousness" traits of personality and "personal control" subscale of the locus of control. The results could be discussed in terms of training the preschool teacher candidates to improve their self-directed learning readiness levels by considering their personality traits and locus of control.

Keywords: Preschool teacher candidates, Self-directed learning, Locus of control, Big five personality traits.

Introduction

In our era in which knowledge is progressing rapidly, one of the main aims of education is to raise individuals who can assess their own needs of learning and the sources and methods needed to overcome these needs and who can regulate their own motivations during process and who can learn by themselves (Boekaerts, 1999). The two of the significant variables that literature indicates to obtain these skills are traits of personality and individual's locus of control, which can be considered as a personality trait (Lefcourt, 1992). It is stated that individuals, especially who have self-control and internal control, take more responsibility during the learning process and gain more academic success

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(Silvester, Anderson-Gough, Anderson & Mohamed, 2002). It is required for teacher candidates to have this skill to contribute their students' self-directed learning in the future (Şahin & Erden, 2009).

In this study, it is aimed to identify the relationship between (1) the level of readiness for self-directed learning, and (2) traits of personality and the locus of control of the preschool teacher candidates. For this purpose, identifying the degree of the relationship between the level of self-directed learning readiness and the traits of personality and the locus of control is the question to be answered.

In this context, the literature about (1) self-directed learning, (2) theories based on the big five personality traits, (3) locus of control based upon the definition of Rotter's and (4) the relationship between self-directed learning, personality traits and locus of control are discussed as below.

Self-directed Learning

In recent researches, it has been studied how individuals achieve the learning outside the scope of formal education by their own control and which variables are related to this learning. According to Hiemstra (1994), even it takes place in the formal education environments the majority of the learning activities are under the initiative of the individual who learns. According to him, concepts like self-directed learning, self-regulated learning, self-planned learning, self-education, independent learning and open learning are expressing the same phenomenon. During the self-directed learning process control is a very important variable (Brockett & Hiemstra, 1991; Hiemstra, 1994; Knowles, 1990). Zimmerman (1998 cited in Adagideli, Saraç & Ader, 2015) stresses that self-regulated learning could be defined as a self-directed process in which the individuals transform their mental abilities into academic achievement. For self-directed learning it is required for an individual to set the goals and strategies of learning, make decisions about how to use the resources and evaluate the success and lead and sustain his/her motivation. According to Brockett and Hiemstra (1991), the individual who learns with self-management needs to have the self-directed abilities and it is a personality trait.

Big Five Personality Traits

Either inherited or obtained, all the behaviours, talents, desires, emotions and habits which distinguish one individual from another, form one part of the individual's personality (Baymur, 1994).

There are many theorists who have investigated the structure of personality. One of them, Goldberg (1981 cited in Güney-Karaman, Doğan & Esen-Çoban, 2010), put forth the "Big Five" theory about the structure of the personality. Goldberg extended the model of Cattell who accepted an approach that separate the personality into dimensions and he has developed the five factor personality model (Burger, 2006). McCrae and Costra (2003), using the factor analysis technique, first identified the personality with "extraversion", "neuroticism" and "openness". Later, "conscientiousness" and "agreeableness" are added to these dimensions. The results of factor analysis also supported the Big Five Personality Model of Goldberg's (1981). This model is used on this research because it is one of the most widely used personality theory (Sığrı & Gürbüz, 2011).

The concept of "extraversion" expresses being enthusiastic, cheerful, talkative, energetic and humanistic. Whereas "openness" refers to individuals who are open to new experiences and have a strong imagination. Individuals with "neuroticism" tend to experience negative emotions like anger, anxiety, depression, anger, sadness or irritability. Individuals with a sense of high responsibility, self-discipline and determination are

classified under "conscientiousness". "Agreeableness" is concerned with the characteristics of getting well with others and being compatible (Güney-Karaman et al., 2010; McCrae & Costa, 1991).

Locus of Control

As a result of the behaviours shown throughout life, the individual can create an expectancy of generalized reinforcement. Rotter (1990), classified individuals in two groups; one group who consider reinforcements are in their control as "internal locus of control" and others who believe in external forces such as luck and fate as "external locus of control".

Locus of control is associated with a lot of personality variables (Lefcourt, 1992). Rotter (1990), emphasized that individuals with high internal control are more sensitive to their own environment and take more responsibility to regulate it. It is known that belief in internal locus of control is positively associated with harmony (Karahan et al., 2005), self-respect (Özcan-Candangil & Ceyhan, 2006), successful interpersonal relationships (Sayın, 2000), subjective well-being, effective conflict resolution skills (Hisli-Şahin, Basım & Çetin, 2009), coping with stress and burn out state (Tümkaya, 2000).

The Relationship between Self-directed Learning, Personality Traits and Locus of Control

Reviewing the literature, it is observed that the studies investigated the relationship between personality traits and academic achievement (Busato et al., 1999; Sığrı & Gürbüz, 2001; Rubinstein, 2005). There are lots of studies showing that the personality traits have a relationship with learning styles (Busato, Prins, Elshout & Hamaker, 1999; Drummond & Stoddard, 1992; Furnham, Jackson & Miller, 1999). One research identified that except being extraversion, four of the five personality traits; openness, conscientiousness, agreeableness and neuroticism are positively associated with academic success and when all variables are taken with multiple regression analysis, conscientiousness is the most efficient factor that predicts academic success (Sığrı & Gürbüz, 2001). Busato et al. (1999), detected a significant relationship between the "conscientiousness/self-directedness" trait of personality and academic success. Another research conducted with college students, showed us that the most common trait in study group is agreeableness. According to the results of the same research, it is stated that the relationship between personality traits, gender, department and grade point average are not significant. Another result of it, showed that there is not a significant relationship between learning styles and personal traits of students (Yanardöner, Kızıltepe, Seggie & Akmehmet-Şekerler, 2014). However, Rubinstein (2005), in his study conducted with 320 college students, found significant relationship between personality traits, gender and academic departments.

Also it is found that internal locus of control is positively associated with academic success (Dağ, 1991; Sayın, 2000). Students with internal locus of control are aware that success depends on them and pay more attention to achieve their goals (Burger, 2006). And also these students make better use of time and show more constructive responses against blockings (Yeşilyaprak, 2004). Also, it can be said that people who have internal locus of control, indicate more responsibility on their learning process. Jansen and Carton (1999) have found that these people start and finish academic tasks and homework earlier than the external locused people.

Method

This study has a correlational survey design. The correlational research method requires observation of what naturally goes on in the world without interfering directly. The data is analysed to see the relationships between naturally-occurring variables rather than making statements about cause or effect (Field, 2005). In this section, the study group, data collection tools, research design and data analysis were discussed in detail.

The Study Group

In this study convenience sampling method was used. This sampling method is used to describe selection of a sample that has been selected from the target population on the basis of their accessibility or convenience to the researcher (Ross, 2005). The study group consisted of 151 teacher candidates studying at the Preschool Education Department at Atatürk Faculty of Education, Marmara University. All of the participants were junior students and the data was collected in the 2013-2014 academic year. 145 of the participants (96%) were women and 6 of them (4%) were men in the study group. 8 of the participants (5.3%) identified their socio-economic status as low, 132 of them (87.3%) as average and 11 of them (7.3%) as high. Considering the average grade, 4 of the participants (2.6%) have low, 85 of them (56.3%) have medium/average and 61 of them (40.4%) have high grade point average.

Data Collection Tools

Demographic Data Form: With the form developed by researchers, it is intended to obtain the demographic information (age, gender, income rate, sources and time used for informal learning etc.) of the teacher candidates in the study group of the research.

Self-directed Learning Readiness Scale (SDLRS). Self-Directed Learning Readiness Scale (SDLRC) developed by Fisher, King and Tague (2001), is adapted into Turkish by Şahin and Erden (2009). When the structure of original scale of three items; self-management, motivation to learn and self-control skills, and results obtained from the Turkish version are compared, it was found that these three items were overlapped. The Turkish version's Cronbach's alpha coefficients were 0.87 for the subscale of self-management, 0.86 for the subscale of motivation to learn and 0.79 for subscale of self-control skills. There are 40-item and 52-item scales of self-directed learning readiness scale. 52-item scale was used in this study.

Big Five Inventory (BFI). The original form of the inventory is developed by John Bonahve and Kentle in 1991. The Turkish version of the inventory was adapted by Güney-Karaman et al. (2010). Inventory consists of 40 short items some of which are reverse coded. 5 subscales of the inventory are extraversion, agreeableness, conscientiousness, neuroticism and openness. Inventory is Likert-type scale where the responses are ranged from "strongly agree" to "strongly disagree". The internal consistency of the subscales of the Turkish version Big Five Inventory was found as; extraversion α= .77, for agreeableness α= .81, for self-control α=.84, for neuroticism α= .75 and for openness α= .86.

Locus of Control Scale. Locus of Control Scale, developed by Dağ (2002), is a 5 point Likert type scale which consists 47 items. This scale is evaluating whether the individuals believe the consequences of their behaviours are controlled by themselves or other than their own (for example luck or fate). Most of the items on this scale were taken from Rotter's Internal-External Locus of Control Scale (RIELCS). However new items considering control areas which were not included in the adapted items of the original scale, were added and questions were transformed into Likert type to convert it into a structure which is easier to use by the raters (Dağ, 2002). The rising in the points reflects the belief in external locus of control. Internal consistency of the original scale is found as .92 (Cronbach's alpha=

0.92) and test- retest reliability of it is .88 (Pearson's *r*= 0.88). 5 factor structure of the scale is demonstrated as personal control (18 items), belief in chance (11 items), meaninglessness of the effortfulness (10 items), belief in fate (3 items) and belief in unjust world (5 items).

Research design and Procedure

The study which investigates the relationship between the level of readiness for self-directed learning, personality traits and locus of control of the preschool teacher candidates, was designed in the survey model of quantitative research methods. Before the research started, permissions were taken to use the scales, and then the study group of volunteered students from the preschool education department filled the each form in one week intervals. Afterwards each student's forms were matched with each other.

Data Analysis

SPSS 15 statistical packet program was used for analysis of the data obtained during the research. Regression analysis was done in order to test the relationship between the level of readiness of self-directed learning and personality traits and locus of control of the preschool teacher candidates. During the analysis of the data the level of significance was accepted as 0.05.

The sample size for the variables was determined by making use of the sample size table given by Milton (1986). In order to use this table the R2 value was conservatively assumed to be as low as 0.30 and the number of independent variables was taken as 10, the maximum number of independent variables. The table shows figures obtained from the following formula:

$$\mathrm{n} = k + 1 + \frac{t^2(1 - R^2)}{\Delta r_i^2}$$

While the regression analysis was applied the assumptions below were taken into account and considered to be achieved during and before the analysis:

- A linear relationship between dependent and independent variables was identified.
- It was observed that there was not a multiple correlation between independent variables (Pearson correlation coefficient between the independent variables was found smaller than 0.70)
- It was found that the error terms were distributed normally (normality).
- It was found that the variance of error terms were constant.
- It was identified that there was not a relationship between error terms and was found that the assumptions of multiple regression were occurred (Sipahi, Yurtkoru & Çinko, 2006).
- Standard multiple stepwise backward regression was used in this analysis. In this type of analysis to decide on the best set of explanatory variables the researcher includes all the possible independent variables in one multiple regression and rejects them one at a time. The decision to drop a variable is usually made on the bases of the contribution of that variable to the ESS, as judged by the *F* test (Gujarati, 2003).

Results

The results of the statistical analysis with survey data is presented in this section. First, the relationship between the self-directed learning readiness scale total score and locus of

control scale total score was analysed by regression analysis. Then, the predictivity of personality traits and locus of control variables on the level of readiness of self-directed learning were analysed. Later, the relationship between the level of self-directed learning readiness and locus of control and subscales of personality traits were examined separately.

Table 1: *Relationship between self-directed learning readiness and personal control*

Dependent variable: Self-directed learning readiness			
Independent Variable	**β**	***t***	***p***
Personal control	0.253	3.197	0.002
R=0.253	R^2= 0.064	F=10.220	p= 0.02

As indicated in Table 1, it was found that personal control clarify the level of self-directed learning readiness in low terms (R= 0.253; R^2= 0.064; F= 10.220; p= 0.002). Accordingly it can be said that the level of self-directed learning readiness of junior preschool education students has a low relationship with personal-control variable.

Table 2: *Relationship between self-directed learning readiness level and personal control and personality traits together*

Dependent variable: Self-directed learning readiness			
Independent variable	**β**	***t***	***p***
Personal control	0.188	2,728	0.007
Personality trait	0.496	7.188	0.000
R=0.553	R^2=0.306	F=32.679	p =0.000

It was found that personal traits together with the locus of control explain the self-directed learning readiness at a moderate level (R= 0.553; R^2= 0.271; F= 55.512; p= 0.000). Accordingly, it can be said self-directed learning readiness level of junior students of preschool education has a moderate relationship with personal traits and locus of control variables. It can be said personality trait variable depending on the locus of control variable is more of a focus on self-directed learning (β= 0.96).

When the analysis performed on regression assumptions were examined, although explanatory of the obtained model is low due to not encountering with multiple correlation problems and normal distribution of the error terms, it can be said that there is a low relationship between self-directed learning readiness with personality traits and locus of control.

Table 3: *Relationship between level of self-directed learning readiness and different locus of control subscales*

Dependent variable: Self-directed learning readiness			
Independent variable	**β**	***t***	***p***
Personal control	.295	3.684	.000
Belief in chance	.070	.725	.470
Meaninglessness of the effortfulness	.043	.468	.640
Belief in fate	-.097	-1.187	.237
Unjust world	.000	.001	.999
R= .342	R^2= .117	F= 3.842	p = .003

It was found that locus of control levels state the level of learning readiness in low terms (R= 0.342; R^2= 0.117; F= 3.842; p= 0.003). Accordingly, it can be said that self-directed learning readiness level of junior students of preschool education has a low level relationship with the subscales of locus of control. It can be said that personal control

subscale of locus of control variable, has an explanatory effect on self-directed learning (β= 0.295). The others appeared to have no explanatory.

Table 4: *Relationship between self-directed learning readiness level and personal trait subscales*

Dependent variable: Self-directed learning readiness			
Independent variable	**β**	***t***	***p***
Extraversion	.114	2.426	.017
Agreeableness	.046	.609	.544
Conscientiousness	.376	6.347	.000
Neuroticism	.053	1.186	.238
Openness	.086	1.372	.172
R= .610	R^2= .372	*F*= 17.203	= .000

It was found that personal traits subscales express the level of self-directed learning readiness in a moderate level (*R*= 0.610; R^2= 0.372; *F*= 17.203; *p*= 0.000). Accordingly, it can be said level of self-directed learning readiness of junior students of preschool education has a moderate relationship with personal trait subscales. It can be said that conscientiousness of personal traits variable, has an explanatory effect on self-directed learning (β= 0.376). The others appeared to have no explanatory.

Table 5: *Relationship between level of self-directed learning readiness and conscientiousness trait of personality*

Dependent variable: Self-directed learning readiness			
Independent variable	**β**	***t***	***p***
Conscientiousness	.449	8.342	.000
R= .564	R^2= .318	*F*= 69.584	*p*= .000

When conscientiousness trait of personality examined separately it was found that it was explanatory on level of readiness at a moderate level (*R*=0.564; R^2= 0.318; *F*=69.584; *p*= 0.000). According to this, it can be said that there is a moderate correlation between the levels of the self- directed learning readiness and the level of conscientiousness trait of personality (β= 0.449).

Table 6: *Relationship between level of self-directed learning readiness and subscales of personal traits and locus of control variables*

Dependent variable: Self-directed learning readiness			
Independent variable	**β**	***t***	***p***
Extraversion	.113	2.409	.017
Conscientiousness	.356	5.943	.000
Agreeableness	.045	.596	.552
Neuroticism	.073	1.611	.109
Openness	.050	.788	.432
Personal control	.191	2.557	.012
Belief in chance	.020	.300	.765
Meaninglessness of the effortfulness	.000	.002	.999
Belief in fate	-.017	-.469	.640
Belief in adjust world	.029	.390	.697
R= .638	R^2= .407	*F*= 9.620	*p*= .000

It was found that the subscales of locus of control and personality traits are explanatory on the level of self-directed learning readiness at a moderate level (*R*= 0.638; R^2= 0.407; *F*= 17.203; *p*= 0.000). It can be said that there is a moderate relationship between the personal traits and locus of control subscales of preschool teacher candidates and self-

directed learning readiness. It can be said that extraversion and conscientiousness traits of personality together and personal control subscale of locus of control and self-directed learning have a relation ($Beta_{conscientiousness}$= 0.356; $B_{extraversion}$= 0.113; $B_{personalcontrol}$= 0.191). The others appeared to have no explanatory.

When the table was analysed a relationship between extraversion, conscientiousness and personal control was detected, so the relationship between only with these subscales was also examined.

Table 7: *Relationship between level of self-directed learning readiness and extraversion, conscientiousness traits of personality and personal control*

Dependent variable: Self-directed learning readiness			
Independent variable	**β**	***t***	***p***
Extraversion	.204	2.883	.005
Conscientiousness	.097	2.339	.021
Personal Control	.388	7.193	.000
R=0.621	R^2= 0.385	F= 30.729	p= .000

It was found that, extraversion and conscientiousness traits of personality and personal control are explanatory on the level of self-directed learning readiness at a moderate level (R= 0.621; R^2= 0.385; F= 30.729; p= .000). It can be said that if extraversion and conscientiousness personal traits and personal control sub-dimension of locus of control variable are taken together lead to high levels of self-directed learning readiness ($Beta_{conscientiousness}$= 0.097; $B_{extraversion}$= 0.204; $B_{personalcontrol}$= 0.388).

Discussion

The results of analyzing the relationship between the level of self-directed learning readiness and personal traits and locus of control of preschool education students are presented in this section.

According to the research results, dimensions of locus of control explain the level of self-directed learning readiness in low terms. Accordingly, it can be said that level of self-directed learning readiness of junior students of preschool education has a low level relationship with locus of control variable. It was seen that there is a low level relationship between level of self-directed learning readiness of students participated in the study and locus of control subscales. It can be said that "personal control" subscale of locus of control variable can be explanatory power on self-directed learning. The others appeared to have no explanatory. Individuals with internal locus of control believe that events in their life derive primarily from their own actions and they consider the reinforcements are in their controls (Rotter, 1990). As the results of this study revealed, individuals with internal locus of control, or in other words people with personal control can also control their own learning.

Control is defined as an important variable in self-directed learning (Brockett & Hiemstra, 1991; Hiemstra, 1994; Knowles, 1990). As the research results revealed, it can be said that individuals with personal control show more control over their learning whereas individuals who believe in factors beyond personal control show lower levels of readiness during self-directed learning process. It can be concluded that, due to their belief in fate, luck or control of some external forces in learning process as well as in other cases, level of self-directed learning readiness of individuals with external locus of control is lower than the level of readiness of individuals with internal locus of control. The reason why individuals with internal locus of control are more successful (Silvester et al., 2002), can be explained with their being more active about learning and take more responsibility in learning process. Being active in learning process could be explained as

regulating own metacognitive, emotional and motivational situation, or briefly as self-regulation. And, it is also claimed that use of self-regulation strategies are related with the level of students' academic achievement (Kitsantas, Stean & Huie, 2009).

When the effects of personality traits and its subscales on the level of self-directed learning readiness were investigated, personality traits subscales affect the level of learning readiness in a moderate level. Accordingly, it can be said that level of self-directed learning readiness of junior students of preschool education has a moderate level of relationship with personal traits subscales. It can be said conscientiousness trait of personality is explanatory on self-directed learning. It was found that level of self-directed learning readiness of junior students has a relationship in moderate level with individuals with high level of conscientiousness trait of personality.

The other dimensions appeared to have no explanatory. This result suggests a parallelism with similar results obtained from research literature. Sığrı and Gürbüz (2011), in their research on relationship between personality traits and academic success, claimed that conscientiousness trait of personality is the most important feature to predict academic achievement. Similarly, Busato et al. (1999), showed a significant relationship between the dimension of "conscientiousness" and academic success. Moldasheva and Mahmood (2014), put forward that responsible individuals use alternative ways for learning. We can say that results of this research support their point of view.

It was found that personal traits and locus of control together represents level of self-directed learning readiness in a moderate level. When compared to locus of control variable, personality trait variable occurred to be more explanatory on self-directed learning. Reason for this can be explained with personal traits have more comprehensive structure including locus of control variable. When the effects of two independent variables on the self-directed learning was examined, it was found that extraversion and conscientiousness traits of personality together and subscales of locus of control variable, explained self-directed readiness in a moderate level.

As the results of the research indicated self-directed learning is associated directly with some variables. In order to raise individuals who are prone to self-directed learning, first it has to be aimed to identify the factors affecting this situation and increase this prone with interventions of which positive effects are proved. It was shown that with some interventions, internal locus of control based thoughts could be increased (Marsh, Trautwein, Lüdtke, Köller & Baumert, 2005).

Conclusion and recommendations

As a result, it was seen that the level of self-directed readiness of preschool teacher candidates are related to locus of control and personal traits. However, personal traits are more related to self-directed learning. It can be said that, especially "extraversion" and "conscientiousness" traits of personality and individuals with high level of personal control have an impact on self-directed learning readiness.

As it was shown in the conducted study, locus of control and personal traits have an effect on level of self-directed learning readiness. However, this relationship is not on a high level. For this reason, other variables which may have effect on self-directed learning readiness can be evaluated in accordance with literature and new researches can be planned. Also, the research can be repeated by increasing the number of teacher candidates in the study, so the relationship level can be identified again. In this study the relationship analysed only with preschool teachers. Research can be repeated with other teacher candidates from different departments and differences between departments can be examined. Yaman, Dündar and Ayvaz (2015) were found that teacher candidates'

achievement motivations significantly differ according to their grade level. Then the grade level could be accepted as another variable to control if it has an effect on the self-directed learning readiness of the targeted group. Awareness on self-directed learning can be increased by adding programs that can improve self- management skills in to the teachers' education. In this way teachers, as self-directed learning individuals, can be role models to their students.

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Sensitivity of Students to the Natural Environment, Animals, Social Problems and Cultural Heritage

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Abstract

The study aims to determine the sensitivity levels of fourth-grade students to the natural environment, animals, social concerns and cultural heritage. Besides, it has been investigated whether some personal characteristics of the students have differentiating effect on the views related to the sensitivity to the natural environment, animals, social concerns and cultural heritage. The participants of the study were a total of 447 fourth-grade students attending fifteen different public schools in Afyonkarahisar province in the school year of 2014-2015. The data of the study were collected through the administration of the sensitivity value scale developed by the author of the current the study. The scale consisted of four dimensions and included fifty-eight items. In regard to content and face validity, the scale was reviewed by the field specialists. For construct validity first and second order confirmatory factor analysis was employed. In addition, the Cronbach alpha coefficient was found for the reliability of the scale. The findings of the study showed that the participants had sensitivity to the natural environment, to animals, to social concerns and to cultural heritage. It was also found that the gender of the students, residence, the educational background and occupation of parents and the frequency of follow up news had statistically significant effects on the sensitivity levels of the participants.

Keywords: Sensitivity value, Confirmatory factor analysis, Primary students, Social studies.

Introduction

Doğanay (2006) argued that the course of social studies makes use of the content and methods of other disciplines about society and people to deal with the interaction of people with their physical and social environment in an interdisciplinary way and to produce individuals who are equipped with basic democratic values. One of the major goals of this course is to produce active citizens who can make informed decisions and solve problems in a changing world (Öztürk, 2009). Social studies is one of the main courses of the elementary and middle school curriculum in Turkey. Social studies took educators attention because it prepares students as active citizens (Kılınç, 2014). Active citizens are aware of the problems in society and attempt to eliminate these problems. They are also aware of their rights and responsibilities. They are expected to know and

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make use of their rights, to fulfil their responsibilities and to involve societal activities (Kuş, 2013). Karatekin & Sönmez (2014) argued that active citizens should not be insensitive about the problems they meet. Instead, they should search for the reasons for these problems and attempt to solve. It is one of individuals' responsibilities for themselves, other people and the world. In recent periods, the values education has become an effective method in producing active citizens. From 2005, the values education has been part of primary social studies programs.

The values included in the social studies programs in Turkey are as follows: importance of family unity and health, respect for the flag and national anthem, rights and freedoms, differences, fairness, independence, peace, freedom, scientific, industriousness, solidarity, sensitivity, integrity, aesthetics, tolerance, hospitality, cleanliness, nature, responsibility, patriotism and charity (MONE, 2010). Some of these values were included in the programs for different grades while others were grouped into sub-categories. For instance, the value of respect has five sub-categories and that of sensitivity has three sub-categories, which are related to historical heritage, natural environment and cultural heritage (Keskin & Öğretici, 2013). In the social studies program for grades of 4, 5, 6 and 7, which became effective in 2005, the most frequently stated value is that of sensitivity. Sensitivity to the natural environment is one of the most frequent improvements targeted social studies (Merey et al., 2012). In this course, there are certain values which are directly related to the natural environment and its protection. These values are that of love, respect, sensitivity, cleanliness, responsibility, fairness, solidarity, peace and aesthetics (Karatekin & Sönmez, 2014). One of the major goals of environmental education is to produce individuals who have environmental literacy which refers to cognitive and affective qualities about responsible acts towards the environment. Sensitivity to the environment is one of the significant ingredients of environmental literacy (Sivek, 2002).

In producing responsible and sensitive individuals, informing them about social topics is a significant step. In addition, students should perceive social problems in a healthy way and have sensitivity to problems (Johnson, 2005: cited in Öcal et al., 2013). Kıncal & Işık (2003) analysed the democratic values and concluded that the values of sensitivity, responsibility and fairness are among the most included values in education worldwide. Kıncal & Işık (2003) found that basic democratic values include equality, respect for life, freedom, justice, honesty, quest for good, cooperation, self-confidence, tolerance, sensitivity and responsibility. Individuals are expected to be sensitive to not only environmental and social problems, but also to cultural/historical heritage which consists of material and spiritual elements from the past. In a similar vein, the social studies program covers a learning domain called culture and heritage. This domain is explained as follows: "In this learning domain students generally become familiar with basic elements of Turkish culture and develop an attitude towards the protection and improvement of it. Students comprehend the fact that cultural elements in a society are distinctive features which make a distinction between their society and other societies and that cultural elements which are transferred from local to national and from national to international contribute to make culture much more varied." (MONE, 2010). In short, students are expected to be informed about and make evaluations concerning the cultural heritage of their society, about the continuity of culture and their own origins and to define their cultural and social identities (Çulha Özbaş, 2009). In social studies teachers play a significant role in protecting the cultural heritage and in developing awareness about its protection and significance of cultural heritage, and also in producing individuals who can internalize this awareness (Selanik Ay & Kurtdede Fidan, 2013). In teaching the topics related to cultural heritage, teachers may make use of several fields and materials such as historical places, cultural landscape, natural sites, sacred places, museums, festivals,

traditional crafts, language, oral and written literature, religion and beliefs, rituals, music and dance, food culture, traditional children's games and sports (Çulha Özbaş, 2009).

Research suggests that sensitivity is among the values to be taught to students. Susar Kırmızı (2014) reviewed the textbook for the fourth-grade Turkish language course in order to find which values were included in the texts. In the study of Susar Kırmızı (2014), it was found that the most frequently stated value in the texts was love of nature/sensitivity to natural environment (35% in 14 texts). Ekinci et al. (2011) also reviewed the Turkish language textbooks for the grades of 6, 7 and 8 in order to find which values are implied in the texts. They concluded that the most commonly emphasized values were patriotism, recognition of the national identity and sensitivity to cultural heritage and history. Keskin (2008) examined the social studies programs which have been implemented since the establishment of the Republic Turkey. In the study of Keskin (2008), it was found that all social studies programs included values and that the common values across the programs were cooperation/assistance, awareness, independence and responsibility. On the other hand, there are studies arguing that although values are covered in the educational programs and textbooks, students cannot acquire them sufficiently. In a study by Yiğittir & Öcal (2011), teachers reported that the acquisition of the values such as academic honesty, scientific diligence, sensitivity to the natural environment, aesthetics, respect for diversity, sensitivity and sensitivity to cultural heritage, awareness about historical heritage, self-confidence and responsibility cannot be efficiently transferred to students. Elbir & Bağcı (2013) reviewed 16 master's theses and five PhD theses in their study. They concluded that teachers did not have necessary information about the values education. Although values are the center of education, the necessary importance has not been given to the values education. In education subjects and academic learning are emphasized, but there is a tendency to neglect the values (Einarsdottira et al., 2015).

Sensitivity refers to developing relations with the world and the events and developing a responsibility about them. It is certain that individuals have ongoing relationships with the environment and the world. On the other hand, individuals live in an environment of which they are inseparable part. Therefore, individuals should have relations to their environment and be sensitive to each ingredient of the environment. Therefore, it is very significant that the awareness of students about sensitivity values should be improved (Keskin & Öğretici, 2013). There are numerous studies about the environmental sensitivity of students and also, of student teachers (Çabuk & Karacaoğlu 2003; Makki et al., 2003; Huang & Yore, 2003; Yilmaz et al., 2004; Tuncer et al., 2005; Erol & Gezer 2006; Uzun & Sağlam, 2006; Başal et al., 2007; Chu et al., 2007; Kaiser et al., 2007; Tuncer, et al., 2009; Gülay, 2011; Tirri & Nokelainen 2011; Ozsoy et al.; Yaşaroğlu, 2012; Bilge, 2015; Başal et al., 2015). However, there is no study specifically dealing with the sensitivity levels of primary students and secondary schools about the natural environment, animals, cultural heritage and social problems. Therefore, the major aim of the study is to reveal sensitivity levels of fourth-grade students attending public schools concerning the natural environment, animals, social problems and cultural heritage. In parallel to this aim, the current study seeks to answer the following research questions:

1) At which level do the fourth-grade students have sensitivity to natural environment, animals, social problems and cultural heritage?
2) Does sensitivity of the fourth-grade students significantly vary based on the following factors?
    a) Gender
    b) Residence
    c) Educational background of parents

d) Occupations of parents
e) Frequency of following news

Method

Model of the study

This study, which aims to reveal the sensitivity levels of fourth-grade students, attending public schools, concerning the natural environment, animals, social problems and cultural heritage based on some variables, was designed as having a scanning model.

Participants

The participants of the study were a total of 447 fourth-grade students attending fifteen different public schools in Afyonkarahisar province in the school year of 2014-2015. Of them 238 were females (53.2%) and 209 (46.8%) were males. In regard to residence, 296 resided in the city centre, 123 in the villages and 28 in towns. Table 1 presents demographic data about the participants.

Table 1. *Demographic data about the participants*

		n	**%**
Gender	Female	238	53.2
	Male	209	46.8
	Total	447	100
Residence	Village	123	27.5
	Town	28	6.3
	City	296	66.2
	Total	447	100
Educational background of father	Illiterate	10	2.2
	Literate (without any formal education)	40	8.9
	Primary school	147	32.9
	High school	153	34.2
	Undergraduate	81	18.1
	Graduate	16	3.6
	Total	447	100
Educational background of mother	Illiterate	17	3.8
	Literate (without any formal education)	44	9.8
	Primary school	223	49.9
	High school	100	22.4
	Undergraduate	53	11.9
	Graduate	10	2.2
	Total	447	100
Occupation of father	Public servant	117	26.2
	Worker	139	31.1
	Private sector employer	48	10.7
	Tradesman	79	17.7
	Farmer	64	14.3
	Total	447	100
Occupation of mother	Public servant	49	11
	Worker	32	7.2
	Housewife	359	80.3
	Other	7	1.6
	Total	447	100

Table 1. (Cont.) *Demographic data about the participants*

How often you follow news?	Never	32	7.2
	Once a month	6	1.3
	Once a week	39	8.7
	Several days a week	186	41.6
	Everyday	184	41.2
	Total	447	100

Data collection tools

The data of the study were collected through the sensitivity value scale developed by the author. The scale also includes a demographic form which covers items related to the gender of the student, residence, educational background and occupation of parents and frequency of following news. The scale consists of four dimensions, namely sensitivity to natural environment, sensitivity to animals, sensitivity to social concerns and sensitivity to cultural heritage, and includes fifty-eight items. The scale is designed as a three-point Likert-type scale and participants are asked to answer each item using one of the following options: "always (3), sometimes (2) and never (1)". Items in the scale are all positive statements. The codes assigned to each item range between 1.00 and 3.00. The minimum score from the scale is 58, while the maximum score is 174.

The validity of the scale, its content validity, and its construct validity were analysed. For the reliability of the scale, the Cronbach alpha coefficient was calculated. During the scale development, first, the studies concerning the values education and the sensitivity value as well as the similar scales were examined. Then a total of fifty-five fourth-grade students were asked to write an essay about the definition of sensitivity. These essays were analysed by the author and another specialist in social studies using descriptive analysis technique. Based on all findings the scale was designed as having four dimensions: sensitivity to natural environment, sensitivity to animals, sensitivity to social concerns and sensitivity to cultural heritage. Of these dimensions, the sensitivity to environment and the sensitivity to cultural heritage were included in the educational program for the social studies course. The remaining two, namely the sensitivity to animals and the sensitivity to social problems, were added based on the review of literature. Items were written down in a plain and understandable manner and each item expressed a single view or feeling. At the end, the scale was developed with sixty-four items. The item was three-point Likert-type. In order to analyze the appropriateness of the items in the scale for identifying students sensitivity about the natural environment, animals, cultural heritage and social problems, the scale was reviewed by seven field specialists working at a public university.

Content validity refers to the sufficiency of the items about the qualities to be tested in terms of quality and quantity (Büyüköztürk, 2007). Two education specialists, one psychological counselling and guidance specialist, two social studies specialists and two science education specialists reviewed the scale in regard to the content validity and the face validity. The reviews showed that there were three inappropriate items and three overlapping items. Therefore, these items were excluded from the scale. The final version of the scale included a total of fifty-eight items. The scale was used in a pilot study with twenty fourth-grade students to review its intelligibility. Following the pilot study some of the items were redesigned.

For construct validity of the scale first and second order confirmatory factor analysis was employed. Confirmatory factor analysis (CFA) is a special form of factor analysis and is a statistical technique used to verify the factor structure of a set of observed variables. CFA allows the researcher to test the hypothesis that a relationship between observed variables and their underlying latent constructs exists. The factorial model to be

tested may be based on the findings of an amprical study or based on a theory (Sümer, 2000). There are numerous fit indices used to verify the validity of the model in the context of CFA. Of them the most frequently used ones are as follows (Cole, 1987; Sümer, 2000): Chi-Square Goodness (χ^2), Root Mean Square Error of Approximation (RMSEA), Comparative Fıt Index (CFI), Non-Normed Fit Index (NNFI), Normed Fit Index (NFI) and Goodness of Fit Index (GFI). If the values observed are distributed in the following values X2/d<3; 0<RMSEA<0.05; 0.97≤NNFI≤1; 0.97≤CFI≤1; 0.95≤GFI≤1 and 0.95≤NFI≤1, it indicates that there is a perfect fit; the values of 4<X2/d<5; 0.05<RMSEA<0.08; 0.95≤NNFI≤0.97; 0.95≤CFI≤0.97; 0.90≤GFI≤0.95 and 0.90≤NFI≤0.95 indicate an acceptable fit (Kline, 2005; Sümer, 2000). In the first CFA, those items with statistically no significant t values were sought. It was found that there was no such item in the scale, and therefore, no item was not excluded from the scale. The path diagram resulted from the analyses is given in Figure 1.

In addition, CFA showed the following fit indices for the scale: χ^2=5290.08, X^2/sd= 3.33, RMSEA=.072, CFI=.95, NFI=.92, NNFI=.95 and IFI=.95. The analysis indicated that all coefficients given above were at a sufficient level. The fit indices showed that there was a consistency between observed variables and their underlying latent constructs.

Table 2. *Regression and t values for the scale*

Items	Regression values	*t* values	Items	Regression values	*t* values
I1	0.25	9.10	I30	0.32	8.19
I2	0.31	9.66	I31	0.30	7.63
I3	0.34	9.87	I32	0.23	6.98
I4	0.21	9.08	I33	0.27	7.90
I5	0.28	9.77	I34	0.34	7.80
I6	0.14	7.63	I35	0.25	7.85
I7	0.36	8.60	I36	0.25	8.16
I8	0.28	8.29	I37	0.31	8.27
I9	0.40	10.57	I38	0.30	7.15
I10	0.34	9.71	I39	0.27	8.14
I11	0.24	8.80	I40	0.24	7.74
I12	0.22	9.11	I41	0.33	8.48
I13	0.29	8.92	I42	0.29	8.39
I14	0.39	10.02	I43	0.33	8.44
I15	0.36	10.09	I44	0.29	10.46
I16	0.24	8.66	I45	0.30	9.62
I17	0.25	9.09	I46	0.34	11.36
I18	0.30	9.29	I47	0.34	11.24
I19	0.34	9.24	I48	0.29	10.45
I20	0.23	7.79	I49	0.30	9.94
I21	0.29	8.45	I50	0.39	11.75
I22	0.28	8.46	I51	0.35	10.79
I23	0.26	8.48	I52	0.31	8.82
I24	0.52	9.85	I53	0.40	11.54
I25	0.51	9.31	I54	0.37	11.62
I26	0.51	9.58	I55	0.36	11.35
I27	0.29	8.45	I56	0.25	9.96
I28	0.24	8.24	I57	0.36	10.74
I29	0.21	7.71	I58	0.29	10.15

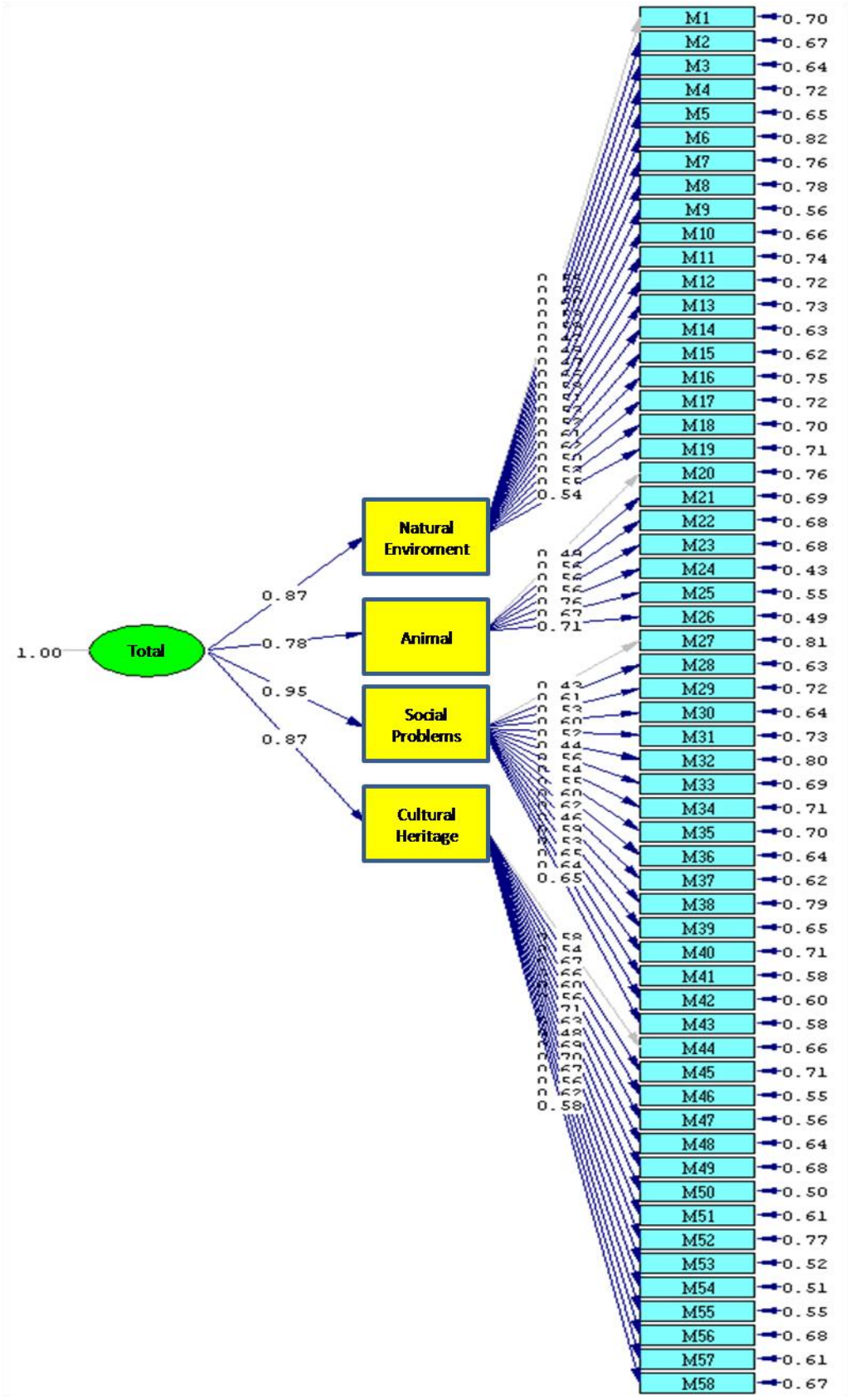

Figure 1. *Shows the regression and t values of the four-factor model obtained from the CFA.*

Table 2 indicates that both the regression values and t values obtained are significant and that the model is confirmed. Table 2 also shows that t values range between 6.98 and 11.75. As stated earlier, the scale consisted of four dimensions. There are nineteen items under the dimension of the sensitivity to the natural environment, namely *i1, i2, i3, i4, i5, i6, i7, i8, i9, i10, i11, I12, 13, i14, i15, i16, i17, i18* and *i19.* The dimension of the sensitivity to animals includes seven items, namely *i20, i21, i22, i23, i24, i25* and *i26*. The third dimension, namely the dimension of the sensitivity to social problems, consisted of seventeen items, namely *i27, i28, i29, i30, i31, i32, i33, i34, i35, i36, i37, i38, i39, i40, i41, i42* and *i43*. There are a total of fifteen items in the dimension of the sensitivity to the cultural heritage, namely *i44, i45, i46, i47, i48, i49, i50, i51, i52, i53, i54, i55, i56, i57 and i58*.

In regard to the reliability of the scale, the Cronbach alpha coefficient was found. The analysis showed that the Cronbach alpha coefficient for the dimension of the sensitivity to the natural environment was .89. It was found to be .81 for the dimension of the sensitivity to animals. The Cronbach Alpha coefficient for the dimension of the sensitivity to social problems was found to be .89. It was found to be .90 for the dimension of the sensitivity to cultural heritage. The Cronbach Alpha coefficient was found to be .96 for the scale as a whole.

Data analysis

The data collected were analysed using the SPSS 20. The normal distribution of the variables was analysed using the Shapiro-Wilk Test. The significance level was set at .05. More specifically, if the significance level is $p<.05$, it refers to not normally distributed variables. However, if it is $p>.05$, it refers to normally distributed variables. The differences among the groups were analysed using the Mann Whitney U test and the Kruskal Wallis-H test when the variables were not normally distributed. Given that the number of units is more than 20 the standardized z values for the Mann Whitney U Test were given. When the Kruskal Wallis-H Test produced significant differences, the groups causing the difference were identified using the multiple/post hoc comparison test. The significance level was set at .05. More specifically, the significance level of $p<.05$ indicated a significant difference while the significance level of $p>.05$ showed a non-significant difference.

Findings

This section presents the findings of the study. Table 3 shows the mean scores of the participants from the scale and from the dimensions of the scale together with arithmetic mean and standard deviation.

Table 3. *Mean scores and standard deviation related to the scale and the dimension scores*

	N	Mean	Median	Minimum	Maximum	*sd*
Sensitivity to natural environment	447	51.2	53.0	31.0	57.0	5.9
Sensitivity to animals	447	18.4	19.0	7.0	21.0	2.8
Sensitivity to social problems	447	46.6	49.0	29.0	51.0	5.1
Sensitivity to cultural heritage	447	40.8	43.0	19.0	45.0	5.2
Total sensitivity	447	157.1	162.0	110.0	174.0	16.6

As can be seen in Table 3, the participants have an overall mean score of M= 157 from the sensitivity value scale. The minimum score from the scale is 58 and the maximum score is 174. The mean score of 157 suggests that their overall sensitivity is at a higher

level. In terms of the dimensions of the scale, it is seen that the participants are sensitive to all dimensions, namely to the natural environment, animals, social problems and cultural heritage.

As stated earlier, the effects of some variables on the sensitivity of the fourth-grade students were analysed. In regard to the effects of gender on their sensitivity levels the Mann Whitney U test was employed. The results of the test are given in Table 4.

Table 4. *The results of the Mann Whitney U Test regarding the effects of gender on the mean scores for the dimensions of the scale*

		Gender					**Mann Whitney U Test**			
		n	***Mean***	***Min***	***Max***	***sd***	***Mean rank***	***Z***	***P***	***Effect size Cohen's d***
Score for the dimension of the sensitivity to the natural environment	Female	238	51.8	35	57	5.7	236.83	-2.261	.024	0.20
	Male	209	50.6	31	57	6	209.39			
	Total	447	51.2	31	57	5.9				
Score for the dimension of the sensitivity to animals	Female	238	18.5	7	21	3	231.08	-1.277	0.202	
	Male	209	18.3	11	21	2.7	215.94			
	Total	447	18.4	7	21	2.8				
Score for the dimension of the sensitivity to social problems	Female	238	47.1	33	51	4.7	232.77	-1.568	.117	
	Male	209	46.2	29	51	5.4	214.01			
	Total	447	46.6	29	51	5.1				
Score for the dimension of the sensitivity to cultural heritage	Female	238	41.1	24	45	5.1	233.74	-1.755	.079	
	Male	209	40.4	19	45	5.3	212.9			
	Total	447	40.8	19	45	5.2				
Total sensitivity score	Female	238	158.5	113	174	16.3	236.16	-2.128	.033	0.18
	Male	209	155.4	110	174	16.9	210.16			
	Total	447	157.1	110	174	16.6				

Table 4 shows that the variable of gender has statistically significant effects on the scores of the participants in the dimension of the sensitivity to the natural environment (p<.05). More specifically, female students had significantly higher mean scores in the dimension of the sensitivity to the natural environment in contrast to male students. Gender was also found to have statistically significant effects on the overall sensitivity score (p<.05) in that again female students had significantly much higher overall mean sensitivity scores in contrast to male students. Effect size has been calculated to determine how much the gender variable has been effective on the sensitivity to the natural environment and the overall sensitivity. These scores (effect size= 0.20 and 0.18) that have been calculated related to the effect size show that the gender variable has little effects on sensitivity. Based on the findings of both the effect sizes that have been calculated, It can be said that the gender variable has quite little (Cohen, 1992) effect on the sensitivity towards the natural environment and the overall sensitivity. Huang and Yore (2003) explored the differences between two culturally distinct (Canadian and Taiwanese students) groups and also developed models of children's responsible environmental behavior. The differences in results for boys and girls, levels of nature participation, and nationalities were found to be significant but of small to moderate effect size. These effect sizes indicate that the comparison groups were more similar than different. (Huang & Yore, 2003).

The potential effects of residence on the sensitivity levels of the participants were analysed using the Kruskal Wallis-H test. The results are given in Table 5.

Table 5. *The results of the Kruskal Wallis-H regarding the effects of residence on the mean scores for the dimensions of the scale*

		Residence		Kruskal Wallis H Test					
		n	***Mean***	***Min***	***Max***	***sd***	***Mean rank***	***H***	***p***
Score for the dimension of the sensitivity to the natural environment	1.Village	123	49	32	57	6.4	177.69	50.366	.001
	2.Town	28	46.4	37	56	5.7	118.88		
	3.City	296	52.6	31	57	5.1	253.19		
	Total	447	51.2	31	57	5.9	2-3 1-3		
Score for the dimension of the sensitivity to animals	1.Village	123	17.8	11	21	2.7	190.02	39.254	.001
	2.Town	28	16.1	12	21	2.8	120.05		
	3.City	296	18.9	7	21	2.7	247.95		
	Total	447	18.4	7	21	2.8	2-1 2-3 1-3		
Score for the dimension of the sensitivity to social problems	1.Village	123	44.8	31	51	5.6	180.32	58.954	.001
	2.Town	28	41	30	51	5.7	98.88		
	3.City	296	47.9	29	51	4.2	253.99		
	Total	447	46.6	29	51	5.1	2-1 2-3 1-3		
Score for the dimension of the sensitivity to cultural heritage	1.Village	123	39.4	24	45	5.6	188.39	53.236	.001
	2.Town	28	35.3	26	45	5.1	95.25		
	3.City	296	41.9	19	45	4.5	250.98		
	Total	447	40.8	19	45	5.2	2-1 2-3 1-3		
Total sensitivity score	1.Village	123	151	110	174	17.9	179.64	59.67	.001
	2.Town	28	138.9	113	170	15.4	94.45		
	3.City	296	161.3	111	174	14.2	254.69		
	Total	447	157.1	110	174	16.6	2-1 2-3 1-3		

Table 5 indicates that the variable of residence has a statistically significant effect on the mean scores of the participants both in overall scores and in the scores of the dimensions. Therefore, it had significant effects in regard to the mean scores of the participants in the dimension of the sensitivity to the natural environment, the sensitivity to animals, the sensitivity to social problems, the sensitivity to the cultural heritage (p <.05). The effect of this variable on the overall sensitivity mean score was also found to be statistically significant (p <.05). More specifically, those participants living in villages and towns had lower overall mean sensitivity scores in contrast to those living in the city. In addition, those living in towns had lower overall mean sensitivity scores in contrast to those living in villages.

The potential effects of the educational background of fathers on the sensitivity levels of the participants were analysed using the Kruskal Wallis-H test. The results are given in Table 6.

Table 6. *The results of the Kruskal Wallis-H regarding the effects of the educational background of fathers on the mean scores for the dimensions of the scale*

		Educational background of fathers					Kruskal Wallis H Test	
		n	***Min***	***Max***	***ss***	***Mean rank***	***H***	***p***
Score for the dimension of the sensitivity to the natural environment	1.Illiterate	10	46	57	4.4	217.4	31.431	.001
	2.Literate	40	36	57	7	199.75		
	3.Primary school	147	32	57	6.3	181.65		
	4.High school	153	31	57	5.2	247.05		
	5.Undergraduate	81	39	57	4.7	260.28		
	6.Graduate	16	39	57	4.6	273.75		
	Total	447	31	57	5.9		3-4 3-5	

Table 6. (Cont.) *The results of the Kruskal Wallis-H regarding the effects of the educational background of fathers on the mean scores for the dimensions of the scale*

	Educational background of fathers					Kruskal Wallis H Test	
		n	***Min***	***Max***	***sd***	***Mean rank***	***H***	***p***
Score for the dimension of the sensitivity to animals	1.Illiterate	10	14	21	2.4	204.75	19.238	.002
	2.Literate	40	12	21	2.6	226.69		
	3.Primary school	147	7	21	3.1	190.17		
	4.High school	153	7	21	2.8	236.8		
	5.Undergraduate	81	12	21	2.3	252.86		
	6.Graduate	16	15	21	2.1	271.66		
	Total	447	7	21	2.8		3-4 3-5	
Score for the dimension of the sensitivity to social problems	1.Illiterate	10	35	51	5.4	182.85	38.721	.001
	2.Literate	40	29	51	5.8	199.6		
	3.Primary school	147	31	51	5.5	180.56		
	4.High school	153	30	51	4.6	243.87		
	5.Undergraduate	81	34	51	3.8	268.93		
	6.Graduate	16	39	51	3.7	292.41		
	Total	447	29	51	5.1		3-4 3-5 3-6	
Score for the dimension of the sensitivity to cultural heritage	1.Illiterate	10	26	45	6.3	206.9	20.188	.001
	2.Literate	40	27	45	5.8	203.44		
	3.Primary school	147	24	45	5.5	191.26		
	4.High school	153	24	45	4.3	245.35		
	5.Undergraduate	81	19	45	5	247.65		
	6.Graduate	16	24	45	6.2	263.03		
	Total	447	19	45	5.2		3-4 3-5	
Total sensitivity score	1.Illiterate	10	126	174	16.9	199.7	34.532	.001
	2.Literate	40	111	174	18.4	200.59		
	3.Primary school	147	110	174	17.7	179.76		
	4.High school	153	115	174	14.9	247.82		
	5.Undergraduate	81	118	174	13.7	263.22		
	6.Graduate	16	119	174	14.6	277.81		
	Total	447	110	174	16.6		3-4 3-5	

As can be seen in Table 6, the educational background of participants' fathers had statistically significant effects on both overall sensitivity scores and the scores for the dimensions of the scale. The variable of fathers' educational background had significant effects in regard to the mean scores of the participants in the dimension of the sensitivity to the natural environment, the sensitivity to animals, the sensitivity to social problems, the sensitivity to the cultural heritage (p<.05). The variable of fathers' educational background had significant effects in regard to the overall mean sensitivity scores of the participants environment (p<.05). Those participants whose fathers were the graduates of primary school had lower mean sensitivity scores than those participants whose fathers were the graduates of either high school or university.

The potential effects of the educational background of mothers on the sensitivity levels of the participants were analysed using the Kruskal Wallis-H test. The results are given in Table 7.

Table 7. *The results of the Kruskal Wallis-H regarding the effects of the educational background of mothers on the mean scores for the dimensions of the scale*

		Educational background of mothers					***Kruskal Wallis H Test***		
		n	***Mean***	***Min***	***Max***	***sd***	***Mean rank***	***H***	***p***
Score for the dimension of the sensitivity to the natural environment	1.Illiterate	17	50.5	40	57	6.2	215.53	21.145	0.001
	2.Literate	44	49.6	37	57	6	187.18		
	3.Primary school	223	50.3	32	57	6.2	205.72		
	4.High school	100	53	36	57	4.7	260.37		
	5.Undergraduate	53	52.9	31	57	5.4	261.34		
	6.Graduate	10	53.1	49	57	2.8	246.45		
	Total	447	51.2	31	57	5.9	2-4 3-4		
Score for the dimension of the sensitivity to animals	1.Illiterate	17	18.5	14	21	2.5	225.76	11.571	0.041
	2.Literate	44	18.2	12	21	2.7	209.59		
	3.Primary school	223	18.1	7	21	3.1	208.85		
	4.High school	100	18.7	7	21	2.7	240.55		
	5.Undergraduate	53	19.2	13	21	2.1	256.32		
	6.Graduate	10	19.8	16	21	1.9	285.6		
	Total	447	18.4	7	21	2.8	3-4 3-5		
Score for the dimension of the sensitivity to social problems	1.Illiterate	17	45.1	35	51	6.2	197.97	22.717	0.001
	2.Literate	44	45.2	29	51	5.4	183.23		
	3.Primary school	223	46	30	51	5.3	207.91		
	4.High school	100	47.8	34	51	4.3	253.7		
	5.Undergraduate	53	48.3	34	51	4.1	266.9		
	6.Graduate	10	49	42	51	3.1	282.15		
	Total	447	46.6	29	51	5.1	2-4 2-5 3-4 3-5		
Score for the dimension of the sensitivity to cultural heritage	1.Illiterate	17	39.1	26	45	6.3	194.91	16.307	0.006
	2.Literate	44	39.5	27	45	5.3	188.64		
	3.Primary school	223	40.4	24	45	5.2	212.21		
	4.High school	100	42.1	28	45	4	253.67		
	5.Undergraduate	53	41.5	19	45	6.2	259.1		
	6.Graduate	10	40.6	31	45	4.6	209.3		
	Total	447	40.8	19	45	5.2	2-4 2-5 3-4 3-5		
Total sensitivity score	1.Illiterate	17	153.2	126	174	19.9	208.56	20.476	0.001
	2.Literate	44	152.5	111	174	17.4	186.25		
	3.Primary school	223	154.8	110	174	17.4	206.93		
	4.High school	100	161.7	122	174	13.2	255.52		
	5.Undergraduate	53	162	115	174	15.8	268.11		
	6.Graduate	10	162.5	149	174	9.4	248.05		
	Total	447	157.1	110	174	16.6	2-4 2-5 3-4 3-5		

Table 7 shows that the educational background of participants' mothers had statistically significant effects on both overall sensitivity scores and the scores for the dimensions of the scale. The variable of mothers' educational background had significant effects in regard to the mean scores of the participants in the dimension of the sensitivity to the natural environment, sensitivity to animals, the sensitivity to social problems, the sensitivity to the cultural heritage (p<.05). The variable of mothers' educational background had significant effects in regard to the overall mean sensitivity scores of the participants (p<.05). Those participants whose mothers were literate without any formal education and those whose mothers were graduates of primary school had lower mean sensitivity scores than those participants whose mothers were the graduates of high school or university.

The potential effects of the occupation of participants' fathers on the sensitivity levels of the participants were analysed using the Kruskal Wallis-H test. The results are given in Table 8.

Table 8. *The results of the Kruskal Wallis-H regarding the effects of the occupation of fathers on the overall mean scores and mean scores for the dimensions of the scale*

		Occupation of fathers					***Kruskal Wallis H Test***		
		n	***Mean***	***Min***	***Max***	***sd***	***Mean rank***	***H***	***p***
Score for the dimension of the sensitivity to the natural environment	1.Public servant	117	52.9	35	57	4.9	261.82	31.974	0.001
	2.Workers	139	50.5	37	57	5.8	205.17		
	3.Private sector employer	48	53.1	41	57	4.5	259.6		
	4.Tradesman	79	51.4	31	57	6	229.53		
	5.Farmer	64	48.1	32	57	6.7	162.23		
	Total	447	51.2	31	57	5.9	5-4 5-3 5-1 2-1		
Score for the dimension of the sensitivity to animals	1.Public servant	117	19	7	21	2.6	251.08	23.509	0.001
	2.Workers	139	18.1	7	21	2.9	208.34		
	3.Private sector employer	48	19.1	10	21	2.4	253.89		
	4.Tradesman	79	18.6	7	21	2.9	237.52		
	5.Farmer	64	17.3	11	21	2.9	169.41		
	Total	447	18.4	7	21	2.8	5-4 5-1 5-3		
Score for the dimension of the sensitivity to social problems	1.Public servant	117	48.2	34	51	3.8	259.83	30.29	0.001
	2.Workers	139	45.6	29	51	5.6	199.96		
	3.Private sector employer	48	48.4	33	51	3.7	267.43		
	4.Tradesman	79	46.7	31	51	5.4	227.42		
	5.Farmer	64	44.7	34	51	5.2	173.91		
	Total	447	46.6	29	51	5.1	5-1 5-3 2-1 2-3		
Score for the dimension of the sensitivity to cultural heritage	1.Public servant	117	41.7	19	45	4.7	249.41	20.712	0.001
	2.Workers	139	40.1	27	45	5.2	203.87		
	3.Private sector employer	48	42.4	24	45	3.9	260.48		
	4.Tradesman	79	41.2	20	45	5.2	234.72		
	5.Farmer	64	38.7	24	45	6.1	180.66		
	Total	447	40.8	19	45	5.2	5-1 5-3 2-1		
Total sensitivity score	1.Public servant	117	161.9	119	174	13.7	260.89	31.669	0.001
	2.Workers	139	154.3	111	174	17.6	203.02		
	3.Private sector employer	48	163	125	174	12	261.85		
	4.Tradesman	79	157.9	110	174	16.9	232.01		
	5.Farmer	64	148.7	117	174	17.9	163.85		
	Total	447	157.1	110	174	16.6	5-4 5-1 5-3 2-1		

Table 8 shows that the occupation of participants' fathers had statistically significant effects on both overall sensitivity scores and the mean scores for the dimensions of the scale. This variable is found to have significant effects on the mean scores for the dimension of the sensitivity to the natural environment, sensitivity to animals, the sensitivity to social problems, the sensitivity to the cultural heritage (p<.05). The overall mean sensitivity score of the participants was also significantly affected by the occupation of fathers (p<.05). More specifically, those participants whose fathers were farmers had lower overall mean sensitivity scores than those whose fathers were private sector employers, or public servants or tradesmen. In addition, those participants whose fathers were workers were found to have lower overall mean sensitivity scores than those whose fathers were public servants.

The potential effects of the occupation of participants' mothers on the sensitivity levels of the participants were analysed using the Kruskal Wallis-H test. The results are given in Table 9.

Table 9. *The results of the Kruskal Wallis-H regarding the effects of the occupation of mothers on the overall mean scores and mean scores for the dimensions of the scale*

		Occupation of mothers					***Kruskal Wallis H Test***		
		n	***Mean***	***Min***	***Max***	***sd***	***Mean rank***	***H***	***p***
Score for the dimension of the sensitivity to the natural environment	1.Public servant	49	53.4	39	57	4.1	261.3	5.881	0.118
	2.Worker	32	50.5	38	57	6.6	216.53		
	3.Housewife	359	50.9	31	57	6	218.64		
	4.Other	7	54	49	57	3.5	272		
	Total	447	51.2	31	57	5.9			
Score for the dimension of the sensitivity to animals	1.Public servant	49	19	13	21	2.3	246.36	4.827	0.185
	2.Worker	32	18.5	12	21	2.7	226.52		
	3.Housewife	359	18.3	7	21	2.9	219.2		
	4.Other	7	20	17	21	1.7	302		
	Total	447	18.4	7	21	2.8			
Score for the dimension of the sensitivity to social problems	1.Public servant	49	48.5	34	51	4	273.81	12.234	0.007
	2.Worker	32	45.8	29	51	5.9	206.55		
	3.Housewife	359	46.4	30	51	5.1	217.16		
	4.Other	7	49.4	44	51	2.8	305.79		
	Total	447	46.6	29	51	5.1		3-1	
Score for the dimension of the sensitivity to cultural heritage	1.Public servant	49	41.8	24	45	4.7	249.96	6.779	0.079
	2.Worker	32	40.7	30	45	5.2	228.48		
	3.Housewife	359	40.6	19	45	5.3	218.24		
	4.Other	7	44.1	40	45	1.9	317.21		
	Total	447	40.8	19	45	5.2			
Total sensitivity score	1.Public servant	49	162.7	119	174	12.7	262.84	8.459	0.037
	2.Worker	32	155.5	111	174	18.6	219.3		
	3.Housewife	359	156.2	110	174	16.9	217.46		
	4.Other	7	167.6	154	174	9.3	308.93		
	Total	447	157.1	110	174	16.6		3-1	

Table 9 indicates that the occupation of participants' mothers had statistically significant effects on both overall mean sensitivity scores and the score for the dimensions of the sensitivity to social problems (p<.05). It was found that those participants whose mothers were housewives had lower mean score for the dimensions of the sensitivity to social problems than those whose mothers were public servant. This variable is also found to have significant effects on the overall mean sensitivity scores (p<.05). More specifically, those participants whose mothers were housewives had lower overall mean sensitivity score than those whose mothers were public servant.

The potential effects of participants' habits of reading or listening to news on the sensitivity levels of the participants were analysed using the Kruskal Wallis-H test. The results are given in Table 10.

Table 10. *The results of the Kruskal Wallis-H regarding the effects of participants' habits of reading or listening to news on the overall mean scores and mean scores for the dimensions of the scale*

		Frequency of following news					***Kruskal Wallis H Testi***		
		n	***Mean***	***Min***	***Max***	***sd***	***Mean rank***	***H***	***p***
Score for the dimension of the sensitivity to the natural environment	1.Never	32	44.7	32	57	7.1	108.95	47.435	0.001
	2.Once a month	6	47.8	42	54	3.9	126.5		
	3.Once a week	39	49.6	39	57	5.7	184.09		
	4.Several days a week	186	51	35	57	5.8	220.18		
	5.Everyday	184	53	31	57	4.8	259.51		
	Total	447	51.2	31	57	5.9	1-4 1-5 3-5 4-5		
Score for the dimension of the sensitivity to animals	1.Never	32	15.7	7	21	3.6	125.08	33.674	0.001
	2.Once a month	6	17.2	15	21	2.4	153.08		
	3.Once a week	39	17.6	11	21	3.1	185.41		
	4.Several days a week	186	18.6	12	21	2.5	225.6		
	5.Everyday	184	19	7	21	2.7	250.08		
	Total	447	18.4	7	21	2.8	1-4 1-5 3-5		
Score for the dimension of the sensitivity to social problems	1.Never	32	42.1	29	51	6.5	132.58	44.35	0.001
	2.Once a month	6	41.7	35	47	4	90.33		
	3.Once a week	39	45.6	32	51	5.2	194.9		
	4.Several days a week	186	46.3	30	51	5	212.08		
	5.Everyday	184	48.2	33	51	4.1	262.48		
	Total	447	46.6	29	51	5.1	2-5 1-4 1-5 3-5 4-5		
Score for the dimension of the sensitivity to cultural heritage	1.Never	32	37.1	27	45	5.8	143.86	22.043	0.001
	2.Once a month	6	39.8	29	45	5.9	200.25		
	3.Once a week	39	40.1	24	45	5	199.04		
	4.Several days a week	186	40.6	20	45	5.2	219.68		
	5.Everyday	184	41.7	19	45	4.8	248.37		
	Total	447	40.8	19	45	5.2	1-4 1-5		
Total sensitivity score	1.Never	32	139.7	110	174	19.7	114.78	43.391	0.001
	2.Once a month	6	146.5	125	162	12.6	123.25		
	3.Once a week	39	152.9	119	174	16	184.5		
	4.Several days a week	186	156.5	117	174	16.4	220.53		
	5.Everyday	184	161.9	113	174	14	258.16		
	Total	447	157.1	110	174	16.6	1-4 1-5 3-5 4-5		

Table 10 shows that participants' habits of following news had statistically significant effects on both overall sensitivity scores and the scores for the dimensions of the scale. This variable is found to have significant effects on the mean scores for the dimension of the sensitivity to the natural environment, of the sensitivity to the natural environment, the sensitivity to animals, the sensitivity to social problems, the sensitivity to the cultural heritage (p<.05). The overall mean sensitivity score was also found to be significantly affected by participants' habits of following news (p<.05). Those participants who never read or listened to news had significantly lower overall mean sensitivity scores than those who read or listened to news once a week or several days a week and those who read or listened to news several days a week had significantly lower overall mean sensitivity scores than those who read or listened to news every day.

Discussion and conclusions

In the study, it was found that the mean scores of the fourth-grade students were high for both the scale as a whole and the dimensions of the scale. Therefore, it can be argued that the participants were sensitive to the natural environment, animals, social problems and cultural heritage. Keskin & Öğretici (2013) examined the effects of the activities used in the social studies course to improve the student awareness about sensitivity. They found that these activities specifically designed to improve sensitivity were successful in achieving the goal. However, it was also found that the knowledge base and awareness of the sixth-grade students regarding sensitivity were very limited, although they studied topics about the sensitivity to the natural environment and the sensitivity to historical heritage in the fifth-grade. On the other hand, they suggested that activity-based teaching and learning should be employed in the social studies courses and that the textbooks should contain much more references to the values education. Erdoğan (2009) found that the fifth-grade students had higher levels of environmental attitudes and the sensitivity to environment.

In the current study it was found that the variables of gender, residence, educational background and occupation of parents significantly affected the sensitivity levels of the participants concerning the natural environment, animals, social problems and cultural heritage. The gender of the participants had statistically significant effects on both their overall mean sensitivity scores and their mean scores for the dimensions of the scale. It was seen that female students had much higher levels of sensitivity in contrast to the male students sampled. Research findings suggest that gender is a significant factor concerning sensitive behaviour of individuals. The inferential statistics showed that female students had higher levels of environmental sensitivity, environment-related information and positive attitudes towards environment. In the literature, gender difference in favour of females is reported in many of research studies (Huang & Yore, 2003; Chu et. al. 2007). Similar results are also reported in studies conducted with Turkish samples (by Çabuk & Karacaoğlu, 2003; Yılmaz et. al. 2004;, Tuncer et. al. 2005; Atasoy & Ertürk 2008; Keskin 2008; Tuncer et. al. 2009; Ozsoy et al.). The findings of the current study are consistent with these previous findings. On the other hand, there are studies suggesting that female students' levels of environmental sensitivity, environment-related information and attitudes were lower than those of male students (O'Brein, 2007).

It was also found in the current study that the place of living had statistically significant effects on both overall mean sensitivity scores and the mean scores for the dimensions of the scale. Those participants living either in villages or in towns had lower mean scores for the dimension of the sensitivity to the natural environment in contrast to those living in the city. It was also found for the dimensions of the sensitivity to animals, social problems and cultural heritage. In addition, those living in towns had lower mean scores in the dimensions of the sensitivity to animals, social problems and cultural heritage in contrast to those living in villages. Therefore, those students living in villages and towns have lower levels of sensitivity to the topics examined in the study. It was seen that residence plays a significant role in shaping sensitivity levels. It is argued that people living in cities are much more anxious about environment than those living in villages (Fransson & Gärling, 1999 cited in Erdoğan 2009). There are studies suggesting that students living in cities have much higher awareness about the environmental problems and are much opitimistic about the solutions for such problems (Tuncer et. al, 2005; Yılmaz et. al; 2004; Yaşaroğlu, 2012). It is natural that students living in cities much more frequently come across environmental problems resulting from rapid urbanization and fast population growth. Therefore, they are very eager to exhibit actions to protect the natural environment (Erdoğan, 2009). The findings of the present study concerning the

higher sensitivity levels of students' living in cities about animals, social problems and cultural heritage can also be accounted for using the same factors.

In the current study, it was found that the educational background of parents had a statistically significant effect on the mean scores of the participants both in overall scores and in the scores of the dimensions. Those participants whose fathers were the graduates of primary school had significantly lower mean scores for the dimensions of the sensitivity to the natural environment, animals, social problems and cultural heritage as well as significantly lower overall mean sensitivity score in contrast to those participants whose fathers were the graduates of either high school or university. In addition, those participants whose mothers were literate without any formal education or the graduate of primary school had significantly lower mean scores for the dimensions of the sensitivity to the natural environment, animals, social problems and cultural heritage as well as significantly lower overall mean sensitivity score in contrast those participants whose mothers were the graduates of either high school or university. Therefore, it is possible to argue that those students whose parents have higher levels of education have much higher levels of sensitivity. In other words, educated parents seem to educate their children more sensitively and more consciously. Such parents encourage their children to read books and to play games and are the models for their children in regard to sensitive acts and behaviours. Varışlı (2009) and Chu et. al (2007) also found that educational background of parents had a significant effect on their children's environmental literacy. Carlisle (2007) argued that the educational background of parents has positive effects on their children's knowledge about environment and their attitudes towards environment. Because educated parents share their knowledge and awareness about environment with their children through different activities (cited in Varışlı; 2009; Erdoğan, 2009; Yaşaroğlu, 2012). Makki et. al. (2003) also concluded that the educational background of parents has positive effects on their children's knowledge about environment and that those students whose parents have graduate education had higher levels of environment-related information and much more positive attitudes towards environment in contrast to those whose parents were the graduates of high school or whose parent had lower educational levels. Keskin (2008) stated that the higher educational levels of parents higher scores for the sensitivity to historical heritage and to the natural environment. All these findings are consistent with the present findings and therefore, it can be argued that the educational levels of parents plays a significant role in their children's sensitivity to the natural environment, animals, social problems and cultural heritage.

In the current study, it was found that the occupation of participants' fathers had statistically significant effects on both overall sensitivity scores and the mean scores for the dimensions of the scale. More specifically, the participants whose fathers were either farmers or workers had significantly lower mean scores for the dimensions of the sensitivity to the natural environment, animals, social problems and cultural heritage than those whose fathers were private sector employers, or public servants or tradesmen. Yaşaroğlu, (2012) concluded that those students whose fathers were public servants exhibited much more environmentally sensitive behaviour in terms of interest in environment, cleaning-saving and love for animals in contrast to those students whose fathers were tradesmen or whose parents were unemployed. Keskin (2008) also found that there was a statistically significant correlation between the sensitivity of the fifth-grade students to the natural environment and historical heritage and the occupation of their fathers. This correlation was in favor of those students whose fathers were either public servant, or tradesman or self-employed.

In the study, it was also concluded that the occupation of participants' mothers had statistically significant effects on their mean scores. More specifically, those participants

whose mothers were housewives had significantly lower mean scores for the dimension of the sensitivity to social problems as well as significantly lower overall mean sensitivity scores in contrast to those whose mothers were public servants. Therefore, it can be argued that children whose mothers are employed have much more sensitivity to social problems. Staub (1979) stated that social sensitivity refers to behaviour related to positive social acts and related to the needs of other people. People have an instinct of considering the outcomes of their behaviour. If this inherent tendency is improved during the childhood and adolescence periods, individuals become responsible for their acts and sensitive to the society. However, if it is not improved or not encouraged, they become both irresponsible and insensitive. Societal sensitivity is one of the basic life skills and it first emerges in family context and improves in the peer circles and in school (cited in Akman . et. al., 2006). Varışlı (2009) concluded that environmental knowledge which is a significant ingredient of environmental literacy was much higher in the students whose mothers were employed. Those students whose mothers are employed better know the concepts related to the environmental sensitivity. For instance, Keskin (2008) found that there was a significant correlation between the sensitivity of the fifth-grade students for the natural environment and historical heritage and the occupation of their mothers. This correlation was positive for the students whose mothers were public servants. This finding is consistent with the current finding. Therefore, it is possible to suggest that both educational background of parents and their employment status have significant effects in children's acquisition of knowledge, values and skills.

In the study, it was also found that participants' habits of following news had statistically significant effects on both overall sensitivity scores and the scores for the dimensions of the scale. Those participants who never read or listened to news or those who read or listened to news several days a week, once a week or once a month had lower mean scores for the dimension of the sensitivity to the natural environment, animals, social problems and cultural heritage than those who read or listened to news every day. This finding clearly shows that frequent follow up news has positive effects on the sensitivity levels of people. Through follow up actual events the awareness of students about the world improves and they can relate their learning with real events and apply their learning to the actual problems or situations. It is argued that interest in actual events improves interest in the world (Moffatt, 1957; Ord, 1972 cited in Gedik, 2010).

Based on the findings of the study, the following suggestions were developed:

- Given that both education and socio-economic status are significant in producing sensitive individuals, parents living in villages or unemployed parents can be trained about sensitivity.
- During the pre-school education behaviour related to the sensitivity to environment, animals, cultural heritage and social problems can be emphasized to begin to educate children.
- Projects can be developed to make sensitivity common in family, school and society; such projects may target younger children.

In order to create awareness on sensitivity training can be offered to people in public education centres and in workplace and media may also support for similar attempts and activities.

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The Effects of Syllable-Awareness Skills on the Word-Reading Performances of Students Reading in a Transparent Orthography

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Abstract

The present study investigates the effects of syllable awareness on the word-reading process of students reading in a highly transparent orthography (Turkish). The participants were 90 second graders belonging to one of two distinct levels of syllable-awareness skills (50 with poor syllable-awareness skills and 40 with proficient syllable-awareness skills). The students were tested individually, using three computerized paradigms that assessed their syllable-awareness skills and their efficiency at determining the identicalness of real- and pseudo-word pairs. The obtained data were analysed using two different MANOVAs and one-way ANOVAs. Findings from the present study point out that syllable-awareness skills were one of the most important indicators of the word-reading performances of students reading in a transparent orthography. In the discussion section, evidence is discussed on the basis of how syllable-awareness skills have a positive effect on the word-decoding process for a highly transparent orthography, and some practical suggestions are given regarding how teachers can embed these skills in their reading curricula.

Keywords: Reading, syllable awareness, Word decoding, phonology, Dual-route reading model.

Introduction

Reading is the most important aspect of educational activities, one of the fundamental academic skills that students are expected to acquire in their first few years of schooling. When the relationship between reading skills and academic achievement is analysed, it is found that students with poor reading skills cannot be expected to demonstrate successful performance in academic fields, and in fact their entire academic lives can be adversely affected by delays in acquiring reading skills (Güzel, 1998).

Despite the existence of different definitions in the literature, reading can be defined in the most functional way as follows: In the process of reading, readers first decode the words in the written texts by using appropriate orthographic, phonetic and morphological knowledge and skills. Later, they associate the words that they decoded with both their existing phonological lexicon and their previous knowledge and experiences, and so they comprehend the meanings of the words. Finally, by analysing the sentences that are

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composed of the words that they comprehended within the context of syntactic characteristics, readers arrive at the intended message (Güldenoğlu, Kargın & Miller, 2014). In many studies (Akyol, Çakıroğlu & Kuruyer, 2014; Catts & Kamhi, 2005; Faust & Kandelshine-Waldman, 2011; Gough & Tunmer, 1986; Nation, 2005; Tunmer, 2008; Tunmer & Greaney, 2010; Vaughn, Linan-Thompson & Hickman-Davis, 2003) where reading skills are tackled in detail, it is reported that observed reading problems stem from two main factors. One is the readers' basic decoding skills of converting written materials into speech. The other factor is the linguistic knowledge and skills that they possess with regard to comprehending the language they have been reading. From this perspective, it is possible to say that reading problems emerge either because of readers' limited decoding skills, as well as their limited linguistic knowledge and skills, or because of limitations that surface in both skills simultaneously (Gough & Tunmer, 1986; Tunmer, 2008; Tunmer & Greaney, 2010). When one considers that the most important objective of reading is to comprehend, it is necessary for readers to decode the words in written texts in an accurate way in order to achieve this objective. After decoding, readers should comprehend properly the words they have decoded. Although it is not adequate on its own for a successful reading performance, the literature shows that the possession of word-decoding skills is one of the important predictors of reading comprehension, and also that it is one of the basic prerequisite skills needed in order to enter the comprehension stage of the reading process (Güldenoğlu, Kargın & Miller, 2012; Hoover & Gough, 1990; Hoover & Tumner, 1993; Kargın, et al., 2011; Kargın, Guldenoğlu & Miller, 2014; Lewis & Doorlag, 1983; Miller, Kargın & Guldenoglu, 2012; Ross, 1976).

When analysing the reading theories in which readers' word-decoding processes are described in detail, it can be seen that these processes are explained in terms of two basic word-reading theories. Phonological Word Reading Theory (Frost, 2006; Frost, Katz, & Bentin, 1987) states that the essence of reading occurs through phonological decoding. Readers first decode the phonological structure blocks (letter and syllable combinations) and later they associate these phonologically decoded words with meanings already in their own phonological lexicon. The Dual-Route Cascaded Word Reading Model, (Jackson & Coltheart, 2001), however, claims that readers decode words by adopting two different routes/strategies (lexical or nonlexical processing strategies). According to this theory, during the utilization of the nonlexical route, which is based on phonological foundations, readers decode the words by dividing them into phonological structure blocks, as mentioned in the previous theory. However, during utilization of the lexical reading route, which is based on a phonological lexicon, they rely on a process that connects the letter strings of written words with permanent orthographic knowledge (representation) that mediates their meaning. According to this theory, when readers first encounter words that are not in their personal phonological lexicon, they use the phonological/nonlexical route. When they have come across the same word a few times, however, they use the orthographic/lexical route, since they now have a prior input into their phonological lexicon with regard to these words.

When the contents of the above-mentioned word-reading theories are considered, it can be seen that becoming phonologically knowledgeable and skilful in the word-decoding process is a common and indispensable characteristic of both theories. Research underlines the fact that, particularly in the first years of primary school, the phonological knowledge and skills that students are expected to gain are among the most powerful predictors of their future reading performances (Ehri, Nunes, Stahl & Willows, 2001; Kjeldsen, Kärnä, Niemi, Olofsson & Witting, 2014; Rakhlin,Cardoso-Martins & Grigorenko, 2014; Report of the National Reading Panel, 2000; Schatschneider, Carlson, Francis, Foorman & Fletcher, 2002; Share, 1995; Shaywitz & Shaywitz, 2005; Snow, Burns & Griffin, 1998; Stanovich, 2000; Troia, 2004; Vellutino, Fletcher, Snowling & Scanlon, 2004).

In addition, in different studies on this subject, many researchers indicate strong relationships between fluent reading and gaining these skills at early stages (Ehri, 2002; Frost, 1988; Paap & Noel, 1991; Perfetti, 1985; Samuels & Farstrup, 2006; Therrien, 2004; Torgesen, 1999). From this perspective, it is evident that phonological knowledge and skills are among the basic capacities required for a successful word-decoding performance. When we look at the skills emphasized in the literature as the ones that impact on fluent word-decoding skills, we see that they can generally be grouped as grapheme-to-phoneme conversion skills, independent phoneme-decoding skills and syllable-awareness skills (Durgunoğlu & Öney, 1999, 2002; Öney & Durgunoğlu, 1997; Öney & Goldman, 1984). In this study, our objective is to analyse the effect of syllable-awareness skills on word-reading performances.

Syllable awareness is one component of phonological awareness. It is developed towards the beginning of the phonological-awareness sequence of skills. It is generally mastered in kindergarten as an auditory skill, but once children start to become readers during the first year of schooling, teachers should introduce letter tiles or squares and manipulate them to form sounds and words. The syllable-awareness skill, which basically means the ability to distinguish between the phonemes that constitute words, can be further defined as the ability to recognize different combinations of phonemes in word structures that are constructed based on alphabetic principles (Ott, 1997; Wright & Jacobs, 2003).

When syllable structures in Turkish are analysed, it is seen that syllables can be constructed in six different ways, depending on the number of sounds in the syllables and the location of these sounds in the syllables (Banguoğlu, 1986). These structures are as follows: 1) syllables with one vowel (V), 2) syllables with one vowel and one consonant (V+C), 3) syllables with one vowel and two consonants (V+C+C), 4) syllables with one consonant and one vowel (C+V), 5) syllables with one consonant, one vowel and one consonant (C+V+C) and 6) syllables with one consonant, one vowel and two consonants (C+V+C+C). While the first three structures are used only in the first syllable of a word, the other three can be used at the beginning, middle or end of a word. In addition, as can be understood from this classification, syllables in Turkish can have a minimum of one letter and a maximum of four letters, and there can be only one vowel in them. Although this explanation depicts a complex structure and varying characteristics of the Turkish language, research in the literature shows that different syllabic organizations in Turkish words can be perceived much more easily than ones in opaque orthographies, due to the transparent orthographic structure of the language (Durgunoğlu & Öney, 1999, 2002; Öney & Durgunoğlu, 1997; Peynircioğlu, Durgunoğlu & Öney, 2002; Raman, 2006; Raman & Weekes, 2005; Raman, Baluch & Besner, 2004). In Turkish, which has a highly transparent orthography, each letter corresponds to one unique sound; in other words, there is a one-to-one relationship between orthography and phonetics, so readers can understand more easily grapheme-to-phoneme relationships and syllables constructed in different ways. These studies also indicate that during the early period of reading education, readers of Turkish gain word-decoding skills faster than readers of opaque orthographies. Studies (Durgunoğlu & Öney, 1999, 2002; Öney & Durgunoğlu, 1997; Raman, 2006; Raman, et al., 2004) underline that in other languages, such as English, which has an opaque orthography, the same letter combinations can be vocalized differently in different words (e.g., cat, call, car). Therefore, readers of these languages are more reliant on sound and syllable-awareness skills during the word-decoding process than readers of Turkish are. In line with this opinion, much of the research states that readers of transparent orthographies have adequate syllable-awareness skills and can decode the words more effectively than readers of opaque orthographies, and as a result

they can read more fluently (Durgunoğlu & Öney, 1999, 2002; Öney & Durgunoğlu, 1997; Peynircioğlu, et al., 2002; Raman, 2006; Raman & Weekes, 2005; Raman, et al., 2004).

Finally, when all the above-mentioned information is considered collectively, it is obvious that syllable awareness is an important skill in the word-decoding process, particularly in transparent orthographies such as Turkish. In the relevant literature, despite an abundance of research that analyses this subject, the matter is usually tackled within the context of early literacy skills that should be gained before learning to read. Therefore, this skill is usually assessed within the language skills that are gained at an early stage. It is also observed that it is only in a limited number of studies that the relationships between the syllable-awareness skills of students who read in Turkish and their word-decoding performance are described. This situation leads to the fact that findings from international studies in the literature are used as the basis of analyses, when describing the problems of students who have difficulty with word-decoding skills in Turkish, and in the development of appropriate intervention programmes to alleviate these problems. However, it is obvious that the problems readers encounter in a language like Turkish, which has a completely transparent orthography, cannot be fully explained by findings using languages that have an opaque orthography. When considered from this point of view, new and further research is needed, both to fill this important gap in the national literature and to define the relationships between syllable-awareness skills and word-decoding skills of readers in a highly transparent orthography such as Turkish. In line with these factors, this study aims to make a detailed analysis of the syllable-awareness skills of students who read in Turkish and their word-reading performances. We are of the opinion that findings obtained from this study will provide important contributions to an explanation of the difficulties that students experience in their word-decoding skills, as well as to the development of effective intervention programmes to prevent these problems.

Hypotheses

To shed light on whether poor syllable-awareness skills explain the word-reading performance failures of students reading in a highly transparent orthography, we tested three basic hypotheses.

Hypothesis 1. Overall, students would be faster and be more accurate in the processing of real words than in the case of pseudo words.

Hypothesis 2. Students with poor syllable-awareness skills would process both real words and pseudo words more slowly and less accurately than students possessing proficient syllable-awareness skills.

Hypothesis 3. Differences between the two groups would be more prominent with regard to the processing of pseudo words than with regard to the processing of real words.

Method

Participants

The participants were 90 second-grade students who attended a primary school that is affiliated with the Ministry of National Education and located in the Cankaya district of Ankara. When choosing the primary school for the research, particular attention was paid to selecting a school with individuals from average socio-economic backgrounds and which had at least three classes for second graders. Accordingly, a school with four classes of second graders (2a-2b-2c-2d) and an average of 30 students in each class was chosen. When forming the study group, factors such as the students' grade level, age, gender, educational background and whether they had been diagnosed as having specific learning

disabilities were taken into account. To this end, meetings were held with classroom teachers and counsellor teachers of the second-grade students. Later, files of all students were analysed under the teachers' guidance and 90 of them were selected for this study. These students were of the same age, had similar educational backgrounds (all received preschool education), had similar academic performances (all were academically average students in their classes), had gained word-reading skills, had not been diagnosed as having specific learning disabilities and had a balanced gender distribution (Table 1).

In order to determine the composition of the study groups, participants were divided into two groups with respect to their syllable-awareness skills as "students with poor or proficient syllable awareness skills." In order to separate the students into two groups comprising those with poor or proficient syllable-awareness skills, the 90 participants' error averages (which were obtained from the Syllable Awareness Skills Assessment Paradigm) were analysed using K-Means Cluster Analysis. As a result, 40 students were separated into the "proficient syllable awareness" group and 50 students were put into the "poor syllable awareness" group, as shown in Table 1. All the analyses used to construct the study groups, and the results obtained from these analyses, have been presented in detail in the "Findings" section.

Table 1. *Distribution of the Research Groups With Respect To Their Syllable-Awareness Skills and Gender*

Groups	**Gender**			**Age**
	Female	***Male***	***Total***	***Range***
***Proficient**	18	22	40	
****Poor**	23	27	50	6y 2m – 6y 5m
Total	41	49	90	

Note: ** Proficient; students with proficient syllable awareness skills*
***Poor; students with poor syllable awareness skills*

Instruments

In this study, three different computer paradigms were developed to determine the effect of students' syllable-awareness skills on their word-reading performances. These are: a) the syllable-awareness skills assessment paradigm, b) the real-word reading skills assessment paradigm and c) the pseudo-word reading skills assessment paradigm.

In the implementation of these developed paradigms, the DMASTR (DMDX) (DMASTR; developed at Monash University and at the University of Arizona by K. I. Forster and J. C. Forster; http://www.u.arizona.edu/~kforster/dmastr/dmastr.htm) computer program was used. This program automatically records the timing and accuracy of the participants' responses and allows for analysis of the responses after implementation.

a) Syllable-awareness skills assessment paradigm

In this study, a computer paradigm that was developed by the researcher was used to assess the students' syllable-awareness skills. In this paradigm, students were presented with words that were either correctly or incorrectly syllabified on the computer screen, and they were asked to decide whether or not these syllabifications were correct (see Figure 1).

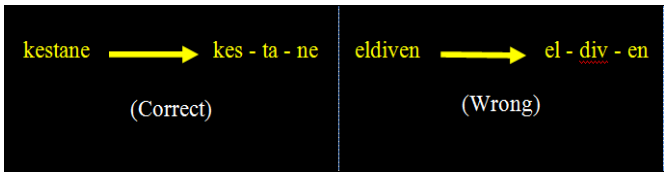

Figure 1. Computer Screen Views of the Syllable-Awareness Skills Assessment Paradigm

During the development phase of the paradigm, three basic stages were taken into consideration. These were: a) determining the words that would be included in the paradigm, b) the linguistic characteristics of these words (number of syllables, word type, printer font, etc. and c) compliance of the determined words with the syllabic structure of the Turkish language.

When we consider the words used in this paradigm, we see that a total of 42 words were used. Of these 42 words, 21 are real words whereas the other 21 are pseudo words. When developing the paradigm, first of all, the meaningful words that were to be part of the paradigm were determined. Later, the letters in these real words were switched around and new pseudo words were derived from them (e.g., "eldiven" is a real word, and "denilev" is a meaningless string of letters derived from it). All the real words in the paradigm were chosen as words that are familiar and simple to understand for students at their level of education. In choosing the words, textbooks and reading books compatible with the students' age were used as the base material.

After the words that would be used in the paradigm were determined, these words were then assessed from the perspective of their linguistic characteristics. After the assessments, it was observed that all the real words in the paradigm are nouns, that they have similar distributions with respect to the number of syllables that they have and that their print fonts were similar to the fonts being used in schools. All the real words used in this paradigm were determined differently with respect to the number of syllables that they have, such as words with one, two, three and four syllables (Table 2). The pseudo words derived from these words, however, were constructed with syllabic structures and numbers of syllables similar to those of real words. To illustrate the process with an example, for the real word "kes-ta-ne" in the paradigm, "tek-na-se," a pseudo word, was derived. The newly derived pseudo word is similar to the original, real word in terms of the number of syllables (both have three syllables) and in terms of syllabic structures (vowel and consonant combinations of syllables are similar in both words).

When the syllabic structures of the words in the paradigm are analysed, it can be seen that all the words comply with Turkish language's syllabic structures; in terms of syllabic variety, they include all the syllabic structures within the Turkish language. When we look at syllabic structures in Turkish, with respect to the number of sounds that form the syllable and the place of these sounds in the syllables, it can be seen that syllables can be formed in six different ways (V, V+C, V+C+C, C+V, C+V+C and C+V+C+C). While the first three can make up the first syllable of the word, the other three can be placed at the beginning, middle or end of the word (Banguoglu, 1986). In this study, during the determination process for the test items that have different syllabic structures, all the above-mentioned syllabic structures were taken into consideration, and it was a precondition that all the syllables of the words used in the paradigm belonged definitively to one of these syllabic structures.

Table 2. *Distribution of the Items With Respect To the Word Type and Syllable Length*

Syllable length	Real words		Pseudo words		Total
	n	Examples	n	Examples	n
Monosyllable	3	(E.g.: kol)	3	(E.g: lok)	6
Bisyllabic	6	(E.g: o-da)	6	(E.g: a-do)	12
Trisyllabic	6	(E.g: o-to-büs)	6	(E.g: o-bü-tos)	12
Four syllabic	6	(E.g: te-le-viz-yon)	6	(E.g: ze-ye-vin-lot)	12
Total	21		21		42

b) Real- and pseudo-word reading-skills assessment paradigms

In this study, two computerized paradigms were developed by the researcher in order to assess students' word-reading skills of real and pseudo words. In the paradigms, students were presented with two words and asked to decide as fast as possible whether the two words that they saw on the computer screen were the same or different. The only difference between the two paradigms is that in the former one, students were presented with real-word pairs, while in the latter one they were presented with pseudo-word pairs (see Figure 2).

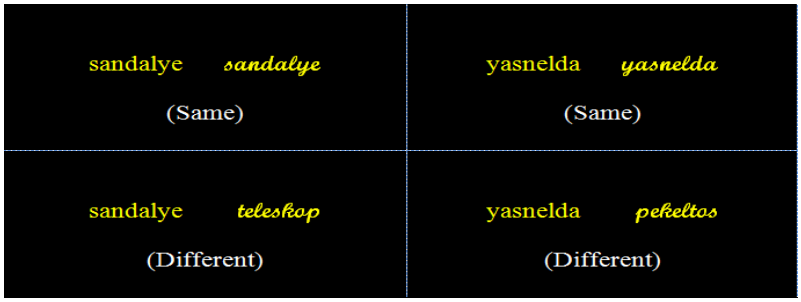

Figure 2. Computer Screen Views for Real and Pseudo- Word Reading-Skills Assessment Paradigms

In the development of the paradigms, three fundamental criteria were taken into account: a) All the words used in the paradigms were words that were determined in the previous syllable-awareness paradigm, b) the two words in the word pairs formed by different words had a similar number of letters and syllables and c) one of the words in each word pair was written in printed letters, while the other word was hand written.

All the word pairs used in the real- and pseudo-word reading-skills assessment paradigms comprise real and pseudo words that were determined in the previous paradigm. In both paradigms, there are 42 word pairs: 21 of which are made up of the same two words while the other 21 are formed by two different words (see Table 3).

Another point paid attention to during the determination of word pairs was that the two words in the word pairs formed by different words should have similar letters and a similar number of syllables. By way of example, as in the case of forming real- and pseudo-word pairs such as "sandalye – teleskop" (a real-word pair) or "yasnelda – pekeltos" (a pseudo-word pair), both of the two words forming the pair are made up of eight letters and three syllables. Besides this, while one word in the pair is presented to students in printed letters, the other word is presented in handwriting. The reason for this is to prevent the students from making their same/different decisions about word pairs that have similar letters and numbers of syllables based only on their perceptions (at the visual/perceptual level), and taking it a step further, to facilitate use of their word-

decoding skills (Kargın et al., 2011, 2014; Güldenoğlu, Kargın & Miller, 2012; Miller, et al., 2012; Miller, 2004a, 2004b, 2005, 2006a, 2006b).

Table 3. *Distribution of the Words With Respect to the Word Type and Syllable Length*

Syllable length	Real words n	Real words Examples		Pseudo words n	Pseudo words Examples	
Monosyllable	6	kol – kol	✔*	6	lok - lok	✔*
Bisyllabic	12	kedi – erik	X*	12	dike - ekir	X*
Trisyllabic	12	sandalye - sandalye	✔*	12	yasnelda - yasnelda	✔*
Four syllabic	12	televizyon - bilgisayar	X*	12	zeyevinlot - basliyigar	✔*
Total		42 item (21 of them same- 21 of them different)			42 item (21 of them same- 21 of them different)	

Note: ✔*: Two words are same*
***X*:** Two words are different*

Validity and Reliability

In this study, a content validity assessment has been made for the validity analysis of the paradigms that were used to assess students' syllable-awareness and word-reading skills. Likewise, for the reliability analysis, the Kuder Richardson Coefficient of Reliability (KR20) has been employed.

During the determination of content validity, explanations regarding the purpose of paradigms, their content and how they are implemented were sent to three Turkish-language teachers who work at two different primary schools in Ankara, and to two university scholars who have conducted research on Turkish language education and reading. Opinions of the assessors were gathered regarding whether the developed paradigms were fit for purpose, their method of implementation and the adequacy of the syllable and word structures used in the paradigms from the perspective of linguistics (number of syllables, syllabic structure, word type, letter font, etc.). The experts were asked to make an evaluation about the content and understandability of the paradigms by using a five-point scale (1: Not suitable at all, to 5: Very suitable) and they were also asked to express their opinions, if any, on how the paradigms could be improved. Subsequently, averages, standard deviations and coefficients of variations of the points that the experts gave to each aspect were calculated for every item in the paradigms. Accordingly, it was decided to include in the paradigms the items whose averages were greater than 4.25, standard deviation was less than 1.00 and coefficient of variation was less than 25%; the paradigms were then given their final forms. As a result of the evaluations, it was maintained that the paradigms were fit for purpose, that their implementation would be easy and practical and that, from a linguistics perspective, all the syllable and word structures used in the paradigms were suitable for the purpose of the study.

The reliability analyses of the paradigms used in this study were made by calculating the KR20 coefficient of reliability. As a result of these calculations, .85, .86 and .81 coefficients of reliability have been obtained for the syllable-awareness skills-assessment paradigm, the real-word reading-skills assessment paradigm and the pseudo-word reading-skills assessment paradigm, respectively.

Procedure

Pilot study. In this study, before switching to the data-gathering process for the main study, a pilot study was conducted with a group of students who had characteristics similar to those of the main study's sample. The pilot study was conducted individually in a designated environment at the same school where the main study was conducted, with

15 students who were not in the research group of the current study. In this pilot study, the objective was to receive feedback about the understandability of the items and instructions used in the paradigms, the length of application time and the usage of the developed computer program by the students. The pilot study revealed that all the items and instructions used in the paradigms were clear to all the students, that the assessments held the attention of the students thanks to the computer program used and that the duration of the test was approximately 10 to 15 minutes.

Main study. All the data pertaining to the main study were gathered through 10–15 minute individual sessions in a vacant classroom in the students' own school. In these sessions, first, the syllable-awareness assessment paradigm that was used in determination of the study group was applied. Subsequently, the real-word and pseudo-word reading skills assessment paradigms were implemented with individual students. Prior to implementation, conversations were held with all the students individually and they were told briefly about the purpose and content of the application. After these short conversations, implementation was carried out only with the students who volunteered to join the study.

While implementing each of the paradigms, three basic stages were followed; these were the explanation, training and test stages. In the explanation stage, which is the first part of the implementation, the experimenter explained the purpose of the relevant paradigm to the students and, by answering two sample items other than the real test questions; he demonstrated a model for them. While serving as a model, the experimenter asked the students to follow him and pay attention to how he handled the implementation. In the second stage, students were asked to do the training implementation that comprised eight sample items, excluding test items, on the computer. Meanwhile, the experimenter watched the students and provided help when needed. After the training stage, and upon a declaration by the student that they were ready, the test stage began. In this stage, students were asked to complete the paradigms independently and as quickly as possible. At the beginning of each paradigm, students were told that if they thought they had made a mistake then they should continue until they reached the end of the paradigm without stopping. Then, the test stage was started.

In this study, all the paradigms that were applied to determine the participant groups' syllable-awareness skills and word-reading performances were computer-aided paradigms. Through this computer program, the responses of students to questions within the paradigms were automatically recorded in terms of speed and error rates. In assessing syllable-awareness skills, students were asked to press the keyboard's "right tab" when they thought that the word they saw on the screen was syllabicated accurately, and to press the "left tab" when they thought that it was syllabicated inaccurately. In the assessment of their real and pseudo-word reading skills, however, students were asked to press the "right tab" when they thought that the word pairs they saw on the screen were the same, and to press the "left tab" when they thought they were different. In order to ensure that these two keys were easily distinguished from other keys on the keyboard, one of the keys was painted with a green " ✔ " mark while the other was painted with a red "✕" mark.

Results

Determining the research groups

In order to determine the make-up of the research groups, the error rates of the students gathered from the syllable-awareness skills assessment paradigm were analysed using the K-Means Clustering Method, and the results are presented in Table 4.

Table 4. *Distribution of the Research Groups With Respect to Their Syllable-Awareness Skills*

Groups	*N*	*M (mean)*	*Sd*	Min.	Max.	*p*
Proficient	40	8.62	3.53	2.00	14.00	
Poor	50	20.68	4.16	15.00	36.00	.000
Total	90	15.27	7.13	2 .00	36.00	

As can be seen in Table 4, students that participated in the study were separated into two groups with respect to the error rates they received according to the syllable-awareness skills assessment paradigm, as students with poor (*n*= 50) and proficient (*n*= 40) syllable-awareness skills.

Word -Reading Performance of Students with Poor and Proficient Syllable Awareness Skills

In order to compare the research groups' word-reading performances, two MANOVAs were conducted, computing the research group (students with poor and proficient syllable-awareness skills) as the between-subject factor, and the level of processing (LoP) (real and pseudo-words) as the within-subject factor. The mean scores of participants' word-reading performances, with reference to reaction times and error rates are presented in Table 5.

Table 5. *MANOVA Results Regarding to Word- Reading Performances of the Research Groups*

	Reaction times			Error rates		
Variables	***F***	***p***	**η^2**	***F***	***p***	**η^2**
LoP	29.74	.00*	.25	26.65	.00*	.22
Groups	8.55	.00*	.08	16.22	.00*	.15
LoP * Groups	2.89	.09	.03	.02	.86	.00
	Means scores of real words			**Means scores of pseudo words**		
Groups	***N***	***Reaction time***	***Error rate***	***N***	***Reaction time***	***Error rate***
Proficient	40	81 (13)	4.62 (4.06)	40	91 (16)	7.30 (4.21)
Poor	50	92 (15)	9.02 (6.48)	50	98 (17)	11.52 (6.53)
Total	90	87 (15)	7.06 (5.93)	90	95 (17)	9.64 (5.97)
	Means scores of overall word reading			**Means scores of lexicality effect**		
Groups	***N***	***Reaction time***	***Error rate***	***N***	***Reaction time***	***Error rate***
Proficient	40	86 (13)	5.96 (3.57)	40	10.25 (13)	2.67 (4.21)
Poor	50	95 (15)	10.27 (5.96)	50	5.37 (14)	2.50 (5.24)
Total	90	91 (15)	8.35 (5.45)	90	7.54 (14)	2.57 (4.78)

Note: **p<.05*
Reaction times were in milliseconds.

The main effect of LoP was statistically significant for both reaction times ($F_{(1,88)}$=29.74, p<.05, η^2=.25) and error rates ($F_{(1,88)}$= 26.65, p<.05, η^2=.22), suggesting that participants processed real word stimulus pairs significantly faster and more accurate than pseudo ones (Table 5). The main effect of groups was also statistically significant for both reaction times ($F_{(1,88)}$= 8.55, p<.05, η^2=.08) and error rates ($F_{(1,88)}$=16.22, p<.05, η^2=.15), indicating that overall students with proficient syllable awareness skills processed written words significantly faster and more accurate than students with poor syllable awareness skills. The interaction between LoP and research groups was statistically not significant for both reaction times ($F_{(1,88)}$=2.89, p>.05, η^2=.03) and error rates ($F_{(1,88)}$=02, p>.05, η^2=.00),

suggesting that the error rates and reaction times differences between the two participant groups were similar for both real and pseudo word reading performances (Table 5).

In order to clarify possible reaction-time and error-rate differences between the research groups under both real- and pseudo-word conditions, we conducted two One-Way analyses, one of which compared the participants' performances under real-word conditions and the other under pseudo-word conditions. The mean scores of participants' real- and pseudo-word reading performances with reference to reaction times and error rates are presented in Table 6.

Table 6. *ANOVA Results Regarding to Real and Pseudo- Word- Reading Performances of the Research Groups*

		Real words (Reaction times)				**Pseudo words (Reaction times)**		
Groups	***N***	***M (sd)***	***F***	***p***	***N***	***M (sd)***	***F***	***p***
Proficient	40	81 (13)	13.56	.00*	40	91 (16)	3.12	.08
Poor	50	92 (15)			50	98 (17)		
		Real words (Error rates)				**Pseudo words (Error rates)**		
Groups	***N***	***M (sd)***	***F***	***p***	***N***	***M (sd)***	***F***	***p***
Proficient	40	4.62 (4)	13.95	.00*	40	7.30 (4)	12.49	.00*
Poor	50	9.02 (6)			50	11.52 (6)		

Not: **p<.05*
Reaction times were in milliseconds.

In error rates analyses, the between group effect was statistically highly significant suggesting that students with proficient syllable awareness skills processed real and pseudo word pairs significantly more accurate, ($F_{(1,89)}$= 13.95, p <.05, $F_{(1,89)}$= 12.49, p <.05, respectively). However, in reaction times analyses, the between group effect was only statistically significant for real words ($F_{(1,89)}$= 13.56, p <.05) but not for pseudo words ($F_{(1,89)}$= 3.12, p> .05), indicating that students with proficient syllable awareness skills processed only real words significantly faster than students with poor syllable awareness skills.

Discussion

The aim of this study was to determine the effects of syllable awareness on the word-reading skills of students reading in a highly transparent orthography. In line with this general purpose, 90 students with both poor and proficient syllable-awareness skills were included in the study, and their word-reading performances have been analysed according to three fundamental hypotheses.

According to the first hypothesis, we hypothesized that, overall, students would be faster and more accurate in the processing of real words than pseudo words. Findings regarding this hypothesis confirmed it and that, overall, students read the real words faster and more accurately than they did pseudo words. Evidence obtained from this hypothesis can be explained according to two basic issues. One is the decoding strategies that the students used during the word-processing paradigms, and the other is the word types that they encounter in these paradigms.

Decoding is defined as the ability to apply your knowledge of letter-sound relationships, including knowledge of letter patterns, in order to correctly pronounce written words. When word-reading theories are analysed, it is seen that readers decode the words using two principal strategies, depending on their competencies in phonology and orthography (Frost, 2006; Jackson & Coltheart, 2001). In the Phonological Decoding Strategy according to which awareness of the phonological structure of words is at the core of the word-reading process, readers first decode the phonemes in the words, and

then combine them in a proper and meaningful way. The Orthographic Processing Strategy, on the other hand, mediates word recognition via detailed orthographic representations that are stored in a permanent orthographic lexicon in which readers first process the words that they encounter as mental images using their permanent orthographic knowledge (representations). Later, they define the words by associating these words with their counterparts within their own phonological lexicons. Studies point out that readers do not know whether or not the encountered word is familiar, that they begin processing it along both routes simultaneously. However, it is the direct orthographic route — which is considered to be faster — that normally identifies the meaning of the word (Güldenoğlu, et al., 2012; Kargın et al., 2011, 2014; Jackson & Coltheart, 2001; Miller, et al., 2012; Miller, 2005, 2006a, 2006b). When all this information is considered together, the results obtained with regard to the first hypothesis of this study can be interpreted in two different ways. As a first explanation, it is possible to say that, while participants were processing real and pseudo words, they might have used two different strategies (phonological and orthographical) depending on the types of words they encountered. To be more precise, the fact that all the words in the real-word paradigm were simple and familiar to the students makes us think that they might have used the orthographic processing strategy in that paradigm. However, the fact that they did not have any prior information in their phonological lexicons for the pseudo words leads us to think that they might have used phonological decoding strategies in that paradigm. In addition, when the reaction times of the students in these paradigms are taken into account, the fact that they spent more time using phonological decoding strategies when pseudo words were decoded also supports the idea that they might use two different processing strategies while processing the words. At first glance, it can be considered that this explanation is more suitable for both areas of usage for the decoding strategies in question, and for the processing that the students performed during the word-decoding procedure. From this point of view, it can be stated that students showing better performances in the case of real words rather than pseudo words, with respect to reaction times and error rates, is an expected outcome.

On the other hand, it is emphasized that readers achieve their orthographic processing levels only as a result of attaining a certain level of mastery in reading experience (Jackson & Coltheart, 2001; Paap & Noel, 1991; Therrien, 2004). Therefore, the fact that the participants were second graders, and that they received education in a sound-based sentence method during their reading education, might have left their reading skills within the influence of sound-based decoding strategies and prevented them from rising to the level of orthographic processing. When the obtained results are evaluated from this perspective, it can be considered that participants of this research might have used a decoding strategy based on phonological foundations in either of the word types (real or pseudo words). Likewise, it can be stated that students might have had greater difficulties in decoding the pseudo words that are made up of letter sequences that do not have a corresponding meaning in the Turkish language, as compared to decoding real words in their phonological lexicons. However, because of the contents and features of the paradigms, it is obvious that by looking only at the results obtained from this hypothesis, it is not possible to reach clear judgements about exactly which strategy/strategies these participants used while processing the two types of words. Therefore, in order to determine participants' word-decoding strategies and obtain clearer information about their performance for both types of words, participants were divided into two groups with respect to their syllable-awareness levels in the second hypothesis, and their performance for both types of words has been comparatively analysed.

Firstly, when the findings of the study are looked at from the perspective of real words, it can be seen that this hypothesis is confirmed; students with proficient syllable-

awareness skills to process real words faster and more accurately than students with poor syllable-awareness skills. In line with evidence obtained from this hypothesis, we are of the opinion that this finding is important for determination of the decoding strategy/strategies that the students used in word reading. More explicitly, if students had used the orthographic processing strategy in the real-word reading paradigm, as mentioned in the first hypothesis, then both groups would have needed to demonstrate similar performances, independently of any syllable-awareness skills they might possess. It should be noted that in word decoding in which the orthographic processing strategy is used, students will not need to resort to phonological processing and, therefore, their syllable-awareness skill levels will not come into play. However, when the results from this study are analysed, the fact that there are significant differences between the two groups leads to the consideration that, in this paradigm, they used a decoding strategy that was different from the orthographic processing strategy. Word-reading theories state that, when decoding words, readers can use a phonological decoding strategy rather than an orthographic processing strategy. It is also known that the ability to use this strategy, which emphasizes phonemic organizations of the word, changes in direct proportion to the extent of the reader's phonological knowledge and information. Because the Turkish language has a highly transparent orthographic structure (due to a one-to-one relationship between graphemes and their corresponding phonemes), it is considered that syllable awareness is one of the most important predictors of phonological decoding in Turkish (Durgunoğlu & Öney, 1999, 2002; Öney & Durgunoğlu, 1997; Öney & Goldman, 1984). Irrespective of word type (real or pseudo words), if readers analyse the syllabic structures of words in an appropriate way, then they can process the words correctly. When the above-mentioned effects of syllable-awareness skills on word reading are considered, we think that all the participants used their syllable-awareness skills within a real-word reading paradigm. As a result of this, students' real-word reading performances varied proportionately with respect to their syllable-awareness levels. This situation is important in that it shows the positive contributions that students' syllable-awareness skills made to their real-word reading performances.

When the findings pertaining to the second hypothesis of the study are looked at from the perspective of pseudo words, it can be observed that this hypothesis was partially confirmed and that students with proficient syllable-awareness skills read the pseudo words more accurately but also at a speed similar to that of students with poor syllable-awareness skills. The literature points to the fact that, during the decoding of pseudo words, readers must use the phonological decoding strategy because they do not have any orthographic information pertaining to these words within their phonological lexicons (Jackson & Coltheart, 2001; Vaughn, et al., 2003). From this point of view, although all the pseudo words used in the study were constructed in compliance with the Turkish language's syllabic structures, it is possible to say that participants needed some phonological decoding processing when decoding these words, as they were composed of letter sequences with no corresponding meaning in Turkish. When we consider that syllable awareness is a skill that lies at the centre of phonological decoding, it can be stated that students' syllable-awareness skills have an effect on their pseudo-word reading performances. When we analyse means of the pseudo-word reading performances of the two participant groups, we see that the results support this opinion and that the performance of the two groups in this paradigm vary in direct proportion to their syllable-awareness levels. This outcome shows that as the students' syllable-awareness skills increase, they are better at analysing and processing the pseudo words in this paradigm. In a direct proportion, when we look at the last hypothesis, we see that it is not confirmed by the results. It has been observed that word-reading performance differences in both types of words were similar for students with both poor and proficient syllable-awareness

skills. These outcomes also support the opinion that participants used their existing syllable-awareness skills in the decoding of both types of words. When analysing reading-performance differences that participant groups showed for both word-reading paradigms, it can be seen that students decoded real and pseudo words using their syllable-awareness skills and, as a result of this, their syllable-awareness levels had similar effects on both types of words.

In conclusion, when all the information presented above is considered together, it is clear that syllable-awareness skills have a positive effect on the word-decoding process in transparent orthographies. Outcomes of this study emphasize two important points in general. First, is the effect of syllable awareness on transparent orthographies; the other is the effect of this skill on the reading intervention programmes that can be provided to students who have limitations in the word-decoding process. The fact that syllables, which are formed by a single vowel or combination of different letters in a language like Turkish, which has a transparent orthography, are vocalized similarly in all words, regardless of their places in the words or the letters with which they are associated, leads to the opinion that syllable-awareness skills play a more important role in the word-decoding process of transparent orthographies than in that of opaque ones. We think that the differences observed between participant groups' word-reading skills can be a guiding light for reading intervention programmes that may be developed, particularly for students who experience limitations in fluent word decoding during the process of reading. From this point forward, based on the outcomes of this study, it will be appropriate to present a few suggestions to teachers. First, it is important that, during the teaching of reading, teachers objectively define the syllable-awareness levels of the students who experience difficulty in the word-decoding process, and then that they should provide appropriate interventions in order to develop them. In this process, in order to enhance the syllable-awareness skills of students who experience difficulties in word decoding; teachers should explain that words are made up of different combinations of syllables. Then they should present to students the words that are formed by as many different syllabic types as possible, and provide examples showing how they should analyse the syllabic structures. It is important to repeat the exercises frequently in order for the students to recognize the different syllabic types that make up words, and to accurately decode and analyse them. We think that as a result of all these applications, students will have enhanced their syllable-awareness skills, that they will be able to decode words more fluently and accurately, and that this will yield both fluent reading and increased comprehension.

This study has some limitations that should be made known to its readers. First, this is the first study on this subject in the Turkish literature, and it is limited by its testing of 90 students. Therefore, we believe that repeating this research with larger sample sizes and including students from different grades with different characteristics will enhance the generalizability of the findings. Second, outcomes of this research are bounded by students' reading performances at the lexical level. Therefore, we think that subsequent research that evaluates students' reading comprehension performances will be important for the development of new and effective reading intervention programmes in transparent orthographies.

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Facilitating Lasting Changes at an Elementary School

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Abstract

The purpose of this study was to determine how to minimize waste in a school setting by reducing, reusing, recycling, and composting waste products. Specifically, the desire was to identify what steps could be taken to decrease waste practices at a Title I elementary school. Through the Washington Green Schools certification process, a Waste and Recycling Assessment and Characterization Audit allowed for the collection of data. The assessment examined how much and what types of waste products were disposed of at the school. Based on the audit, 93% of waste products in the cafeteria were recyclable or compostable. The results provided ways for the students and staff to take action resulting in behavioral changes that taught and modeled environmental conservation. This study can help revolutionize school communities by serving as a prototype for environmental sustainability enhancing an eco-friendly citizenry.

Keywords: Conservation, Eco-friendly, Natural resources, Recycle, Sustainability.

Introduction

In our rapidly changing world, there has been a need to understand how actions of today impact issues of using natural resources for tomorrow. Changing individual behaviors is essential to achieving a sustainable future. Sustainability creates and maintains the conditions so there will be enough resources to protect the environment for years to come (Environmental Protection Agency, 2015). To promote practical sustainability and waste reduction there must be individuals willing to do what is best for communicating the importance of environmental responsibility to those within the school community (Redman, 2013).

Educational institutes are centers for change and can lead to a revolution in the way people view the natural world and maintain it for future generations. School settings can provide students and staff with concrete opportunities to contribute to sustainable living while demonstrating best practices (TerraCycle, 2015). Infusing sustainable behaviors into daily activities a school requires the support of all stakeholders within the school culture (Schelly et al., 2012). Given that more than one million people spend their days in K-12 schools in Washington State, these institutions can play a significant role in

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advancing sustainability awareness and interventions in a community (Washington Green Schools, 2015).

Environmental education is often seen as a hobby for those who have the time and money to support this lifestyle. To support the current needs of elementary students, educators need to look for additional funding to enhance instructional services and activities for the entire school. Providing environmental education and awareness for young students leads to enduring understanding learned through ongoing practices. Communication and shared decision making are important threads linking conservation and educational goals (Schelly et al., 2012). Therefore, the intent is to help students develop habits by taking an active role in what they learn and can do.

Broadening Understanding of Waste Reduction at School

Going "green" at school means students develop and demonstrate an understanding necessary to make ecologically driven decisions and model waste reduction. A school-wide approach is key for all stakeholders to work together to make a lasting change (Griffiths, Richards, & Winters, 2007). To reduce environmental impact through waste reduction, every person can make a difference by improving conservation practices and helping to protect the environment. Changing individual behaviors is essential to achieving a promising green future and a central motivation of sustainable education (Frisk & Larson, 2011).

Why is conservation education necessary in the school setting? Conservation education supports academic success meeting students' current and future needs (Office of Superintendent of Public Instruction, 2015). School settings represent a part of society and have the potential for creating change through promoting conservation. Developing quality educational systems require students to adapt and learn continuously (Frisk & Larson, 2011). Each action of today is a step towards creating a better tomorrow (United Nations Educational, Scientific and Cultural Organization, 1997). The principles and practices developed for long-term effects on the environment should promote green solutions in the community. Because of this, Washington State developed, implemented, and supported environmental sustainability needs in education programs (Nolet & Wheeler, 2010).

Purpose of the Study

The purpose was to identify methods to decrease waste and transform the school setting. After establishing a need for this study, the following questions were asked. What steps are necessary to reduce waste at school? What resources are available for stakeholders to implement in a school setting? Could students participating in a school-wide recycling and composting program make a lasting change?

Each year schools accumulate tons of waste from paper to electronics to food, making them an ideal intervention point for targeted environmental change. Elementary schools face the same stumbling blocks as any other organization attempting to create an organizational culture that values natural resources (Schelly et al., 2012). That is why there is a need to model the desired behaviors to create opportunities for lasting change leading to altering habits focusing on how to reduce, reuse, recycle, and compost.

Past research has indicated that recycling can benefit a community and help sustain the environment for future generations (Environmental Protection Agency, 2015). School communities can lead the way toward conservation by providing a supportive atmosphere for sustainable behaviors (Redman, 2013). Furthermore, conservation education should be infused into the core curriculum and require a new way of teaching, learning, and thinking about the content (Nolet & Wheeler, 2010).

To be able to explain how waste reduction relates to students' lives and values, teachers face a significant challenge in preparing young people to be conscientious citizens. Instilling environmentally friendly behaviors, attitudes, and practices from a young age cannot only have an immediate impact but long-term benefits to society by molding a generation who will be better stewards of natural resources. Incorporating a waste reduction theme as part of a science or reading curriculum engages students in their understanding of waste within the context of sustainable living (Griffiths, Richards, & Winters, 2007). Achieving changes in behavior will come from a shift in values and awareness (United Nations Educational, Scientific and Cultural Organization, 1997).

Teachers who incorporate conservation concepts into their classrooms can face obstacles such as lack of time to learn something new or the time to introduce an idea outside of the core curriculum (Church & Skelton, 2010). If teachers have the necessary resources to support integrated environmental learning opportunities, then students can develop the knowledge and understanding that prompts them to take action that promotes waste reduction. The Next Generation Science Standards supports teachers to express key aspects of environmental sustainability for future generations (Office of Superintendent of Public Instruction, 2015).

Partnership with Local Organizations

Conservation and sustainability can be difficult concepts to explain to elementary students. That is why organizations like Washington Green Schools, TerraCycle, Waste Management, and the Public Utility District's Education Team provide assistance to help educational settings reach environmental goals. To assist with the change educational settings need a researched-based program to provide a framework to help embed fundamental principles of implementing a waste reduction program.

Washington Green Schools is a nonprofit organization dedicated to challenging educational settings to create conservation practices through educational experiences that transform schools. The Washington Green Schools educators collaborate with the staff from schools to outline ways to incorporate sustainability concepts in educational settings. A partnership develops through ongoing conversations that teach and model environmental conservation. Best practices include moving beyond conservation knowledge while inspiring and strengthening concepts thinking toward the future (Shriberg & MacDonald, 2013). One in six people in Washington State spend their day in a K-12 setting (Washington Green Schools, 2015). For that reason, Washington Green Schools is a bridge to create a lasting educational experience in the school environments by educating students on ways to make conservation changes.

By partnering with the TerraCycle Company, students develop a lifestyle that minimizes waste. TerraCycle is an international upcycling and recycling company. Upcycling uses every aspect of waste as value (TerraCycle, 2015). TerraCycle offers a variety of more than 40 Brigade programs that range from collecting drink pouches to plastic containers to candy wrappers. Each Brigade program is designed to take difficult-to-recycle products and convert the materials into innovative products. For each approved waste item collected, the school is awarded two TerraCycle points redeemable for a charitable gift or a payment of $0.01 per point to the school's account. After signing up and creating an account, TerraCycle sends heavy-duty boxes to the school along with pre-paid postage and a mailing label. The students put their empty waste products in the designated boxes. Once the box is full, it gets shipped to TerraCycle and points are credited to the school's account.

The Waste Management website provides free online educational resources, videos, and craft ideas to expand students' understanding of issues related to recycling and

natural resource recovery. The Waste Management's Public Education and Outreach team dedicates resources to the green school initiatives for recycling and composting. The Waste Management organization works to find the most efficient and forward-thinking approach to handling waste. Their goal is to reduce consumption, reuse products, and recycle waste materials that help to conserve natural resources (Waste Management, 2015). Solving conservation problems and generating sustainability opportunities requires active collaboration (Wiek, Withycombe, & Redman, 2011). A partnership develops with the Waste Management Education team through online communications making it possible to incorporate environmental ideas. Working together to reduce the depletions of natural resources, waste reduction systems can result in environmental benefits (Environmental Protection Agency, 2015).

To develop lifelong changes in young people, Snohomish County Public Utility District's Education Team has made a commitment maximizing resources and offering a school-to-world connection through free recycling assemblies and classroom workshops. For example, the Meet the Renewables assembly has "energy" characters igniting school-wide interest in recycling and waste reduction by immersing students on a fun and interactive adventure (Snohomish County Public Utility District, 2015). Students learn about the resources that generate renewable energy. Through audience participation, students are shown how simple actions can minimize their environmental impact to decrease garbage and waste. By the end of the performance, the characters help students realize that the best energy source is energy conservation (Snohomish County Public Utility District, 2015). Having opportunities to have ongoing dialogue about conservation education enhances waste reduction programs.

Journey to Becoming Certified

During the beginning stages of initiating change in school, the students learn that composting organics is one way to reduce methane emissions and decrease their carbon footprint (Hertwich & Peters, 2009). Since composting is nature's way of recycling, compostable organic materials transform organic soil returning the nutrients to the earth which conserves natural resources. The decomposed organic materials produce bacteria in the soil breaking down waste to make organic fertilizer (Environmental Protection Agency, 2015). Furthermore, composting is endorsed by the Environmental Protection Agency as a preferred waste management solution with the potential to reduce greenhouse gas emissions by diverting organic materials from landfills (Hasling, 2012).

Becoming a green school means taking actions by introducing and reinforcing conservation concepts that create a healthy learning environment. Providing students with a supportive environmental infrastructure for taking action is vital to maintaining change in the future (Redman, 2013). The school staff must believe that knowledge is power when making lasting changes. This commitment is a way to establish long-term effects on the environment through increasing recycling, reusing products, and composting materials. Conservation educating requires that students develop the knowledge, skills, and disposition that engage multiple strategies for understanding. Additionally, conservation concepts can provide notable contexts for developing the skills of critical thinking, collaboration, and communication (Church & Skelton, 2010).

Stakeholders view school settings as centers for change which can lead to a revolution in maintaining the environment for future generations. It is important to have teachers and staff as role models to motivate students about environmental conservation (Higgs & McMillan, 2006). By getting the school leaders to model conservation behaviors and positively reinforce those behaviors in others, there is greater potential for utilizing social knowledge as a motivation tool rather than a barrier (Redman, 2013). Collaboration is

critical for understanding and exploring future alternatives in ways that are conducive for action (Wiek, Withycombe, & Redman, 2011). When educational leaders reuse items for different purposes and reduce waste, they are modeling how to take care of the environment while cutting school costs.

How can elementary students make a difference? Students do their part by rethinking how to reduce waste. They select specific strategies for changing their food and waste behaviors while considering any personal constraints to change. As a result, when seeing the actions of others the students become better prepared to lead more sustainable lifestyles while making a difference in their school culture (Higgs & McMillan, 2006). A greener school empowers students to make a change that will stay with them for life (Green Schools Initiative, 2014). Thus, the journey begins by identifying the kinds of actions that can be implemented to make the biggest improvements in becoming more conscious of using resources at school.

Students Initiate an Environmental Movement

The environmental movement began immediately following the Meet the Renewables waste reduction assembly. As a follow-up exercise, a group of fourth graders had a discussion with their teacher about conserving energy while recognizing the environmental benefits of recycling materials. One student asked, "How can we help to make the environment better for our future?" Through the class discussion, the students stated they wanted their school to become more eco-friendly and by working together they could make a difference. Thus, the fourth-grade students were determined to take actions to make lasting change in their school community. That was the day that the student initiative began.

Since students learned how they could conserve at school, they wanted to lead by example and advocated for the inclusion of renewable resources. The educational waste reduction assembly increased awareness and brought environmentally friendly ideas to life by showing concrete solutions and strategies to recycle and compost natural resources (Snohomish County Public Utility District, 2015).

Methods

The intent of this study was to determine if the 770 students (374 girls and 396 boys) and 72 staff members could reduce waste at school. This Title I elementary school had 77% of the students receiving free or reduced-priced meals and 36% of the students were transitional bilingual.

A classroom teacher, custodian, and three students conducted a Waste and Recycling Assessment and Characterization Audit. The materials used for this audit were a digital scale, the assessment sheet, and bins that contained each waste product. The assessment provided specific guidelines for the Green Team to follow. There was a random selection of garbage bins collected in the school cafeteria, classrooms, and main office. Each bin was weighed by the students and recorded on the assessment sheet. The pre-assessment identified the percentage of specific waste products from the three areas within the school.

Staff and students were trained to reduce, reuse, recycle, and compost waste products. Then students from the Green Team created signage for each new waste bin in the cafeteria. The bins were donated by Waste Management and Washington Green Schools. At the end of each month, a post-assessment examined the waste from the bins. There was a comparison between the pre-assessment and the post-assessments from the cafeteria. The data revealed a notable decrease in waste and an increase in recycling and composting.

Forming a Green Team: Supportive Action

The Washington Green Schools program provides educational resources to public and private K-12 schools. This program outlines ways to inform teachers and school leaders about the process to create lasting change reducing schools' environmental footprint. The Washington Green Schools certification program promotes and acknowledges long-term action for lasting changes in six environmental categories.

The first requirement for becoming certified as a waste reduction school through Washington Green Schools was to create a school Green Team. A classroom teacher became the facilitator for the Green Team along with five certificated staff, two classified staff, the principal, and nine fourth-grade students. After forming the Green Team, the group organized efforts associated with environmental responsibility. Then, a discussion began to initiate the process of establishing a school-wide goal to implement lasting change. During the beginning stage of this movement, the Green Team members created a sense of teamwork and the Green Team students became leaders.

Table 1. *Demographics of the student green team members*

Gender	
Girls	7
Boys	2
Age	
Eight years old	1
Nine years old	5
Ten years old	3
Ethnicity	
Hispanic	6
Caucasian	2
Asian	1

The Green Team met every two weeks. They encouraged one another to think of creative ideas to reduce waste that would benefit the environment. Their school-wide goal was to make lasting change by decreasing the amount organic waste and recyclables getting placed in landfills while increasing composting and recycling. However, the achievement of such goals within the school environment needed participation, support, planning, and fortitude from all stakeholders (Colliver, Bishop, & Caristo, 1999).

A fourth-grade student created the Green Team pledge to be responsible leaders of the school. All the Green Team students signed the pledge stating they promised to follow rules, keep the environment clean, tell other students about recycling, and be positive leaders at school (see Figure 1). After making this pledge, the student leaders received a Go Green t-shirt.

Building a Green Team demonstrated that teamwork increased students' awareness of environmental issues empowering them to be leaders while working together to decrease waste (Green Schools Initiative, 2014). The overall message from the team was to create lasting changes within an environmentally friendly school community.

Green Team Students' Pledge

I will promise to follow these rules.

I will sort the recycling from the garbage and the compost.

I will also help the environment by nicely telling other kids about recycling and composting.

I will pick up garbage and recycled stuff and put it in the correct bin.

I will be a positive Green Team leader at school.

I also know how to keep the environment clean and will follow these rules.

_____

Date *Sign your name in cursive*

Figure 1. *Student Pledge.*

Waste and Recycling Assessment and Characterization Audit

Step two of the Washington Green Schools certification program was to select one of six environmental categories to assess in the school setting. The Green Team chose the Waste and Recycling Assessment and Characterization Audit. This category gave an overview of the status of the school's waste, recycling, and composting practices in the cafeteria, classrooms, and office area. Some questions from the guide were:

1) Does your school recycle currently?
2) Are there easy-to-read informational signs on or above your garbage, recycling, and compost bins?
3) How many garbage dumpsters and containers does your school have?
4) How much waste does your school dispose of in one month?
5) After sorting your waste, what percent of garbage could have been recycled or composted?
6) What does your school pay for recycling services?

Results

A random selection of three garbage bins were collected from the cafeteria, main office, and classrooms. The Waste and Recycling Assessment and Characterization Audit provided a snapshot of how much and what types of waste products were at the school. After recording the weight of the waste materials, each item was sorted into recyclables, compostable, and garbage. The sorted contents were weighed again with common items documented. This information helped the Green Team members look for opportunities to reduce or prevent waste.

The Green Team established a baseline of waste generated at school. This measurement revealed that each month the school disposed of 40 yards of garbage, 20 yards of recyclables, and 3 yards of compost materials. Waste Management collected the garbage and recycling. Waste Management is the largest provider of integrated environmental solutions (Waste Management, 2015). Cedar Grove collected compostable materials to help decrease and divert the amount of organic waste that goes into landfills. Cedar Grove is an environmental solution company that harnesses the energy of organic waste through composting (Cedar Grove, 2015).

There was one key finding from the cafeteria that stood out to the Green Team members. After sorting and weighing the waste product from the three random garbage bins, there was 45 lbs of compostable materials, 111 lbs of recyclable materials, and 12 lbs of garage collected. Thus, the data assessment showed 93% of the products in the garbage

were recyclable or compostable. From the waste products collected, 66% was recyclable, 27% was compostable, and only 7% was garbage. There were fifteen 44-gallon bins of garbage a day in the cafeteria. Examples of items put in the trash versus recycled or composted consisted of milk containers, juice containers, fruit, bread, napkins, juice pouches, and soda cans.

The information gathered for step two revealed the current waste and recycling practices. Through the baseline assessment, the Green Team tracked changes, determined potential improvements, and prioritized goals. After the analysis, it was clear that waste products in the cafeteria were not being disposed of correctly. For that reason, it was decided that reducing waste in the cafeteria would be the first place to make an effective, lasting change. Therefore, a goal was set to reduce the waste 50% at school in two months.

Implementation of the Action Plan: Focus in the Cafeteria

Assessing the information collected from the Waste and Recycling Assessment and Characterization Audit, the Green Team made changes in the cafeteria. To obtain a better understanding of barriers to recycling and composting, the Green Team completed the Washington Green Schools program criteria. To begin the Green Team members identified current recycling behaviors and tracked successes over time. After reviewing the assessment results, an action plan created and set realistic targets to improve environmental practices. This lead to the third step of taking action that resulted in implementing lasting change in the focus category.

What kinds of actions were implemented to make the greatest impact on student engagement that promoted waste reduction in the school community? First, the facilitator of the Green Team educated and trained the Green Team students to recognize which waste products went into each waste bin. Modeling allowed students to emulate conservation concepts through continual direct observations that reinforced sustainable practices (Higgs & McMillan, 2006). The students had multiple resources for understanding the recycling process which made it easy to adapt to change. After that, the students created signage to identify what products should go into each bin. Fourth-grade students volunteered to be environmental ambassadors. These students assisted other students with sorting materials as well as emptying recycle bins into a centrally located container. Diminishing confusion about what could be recycled and composted enhanced behavioral changes.

Through the guidance of the school staff, the student body learned the proper procedures to dispose of waste in the cafeteria; for example, recycling milk and juice cartons after emptying the liquid into a bucket. Paper containers, cardboard, and plastic containers were placed in the recycle bin. Excess food products were composted along with napkins, paper bags, and other identified items. Leftover waste items were sorted into separate bins and reusable food trays were stacked. Products brought from home were placed into thermoses and reusable containers.

Green Team Makes an Impact: Verification

When implementing a waste reduction program, it is essential to monitor areas that evolve over time. Thus, the fourth step to becoming certified through Washington Green Schools was verifying the focus area for lasting changes. The study revealed notable results in the first week of implementing changes. The first thing that was evident in the school cafeteria was how students altered the way they disposed of their waste products. Even though this was a work in progress, there was a noticeable difference in the cafeteria between the trash produced during the assessment period as the garbage declined and the recycling increased.

The goal to reduce waste at the school by 50% evolved over two months. The 770 students and 72 staff members were able to reduce the garbage each month. Factors that made a positive change were educating the student body on correct recycling and composting practices, prompting students to take ownership in the program, and using appropriate containers to dispose of the materials properly. Best practice in recycling, reducing, reusing, and composting became an integral part of the school and cafeteria. The integration of two green compost bins, two blue recycling bins, and two red garbage bins made it easy to identify where to deposit waste materials. Also, there was a change to durable trays versus disposable Styrofoam trays as well as using bulk dispensers for condiments and other food products.

Analysis of Data: Findings

A recycling program was an essential piece of conservation when it was modeled and incorporated into the school setting. The Green Team implemented the recycling program by clarifying what waste products were recyclable, determining what was considered actual garbage, and shipping drink pouches and Lunchable containers to TerraCycle. In just one month, there were 12 lbs of drink pouches and 6 lbs of Lunchable plastic containers collected in the cafeteria. As the awareness increased, students worked toward keeping their promise to make a difference in the environment.

In one month, the garbage for the school decreased by 25% from 40 cubic yards of waste to 30 cubic yards. The monthly Waste Management bill decreased by 17% from $980 to $813 saving $167 the first month of implementing waste reductions. Because of the determination of the student body to make a difference in the environment and reduce their carbon footprint, the school reduced the size of its garbage dumpster from a 6-yard dumpster to a 4-yard dumpster.

The findings revealed in Figure 2 show the monthly amount of cubic yards of waste recycled, composted, or disposed of as garbage. Using the Waste and Recycling Assessment and Characterization Audit as a pre-assessment baseline, the garbage decreased 60% in two months from 40-cubic yards of waste to 16-cubic yards and after three months further decreased to 62% resulting in 15-cubic yards of waste. At the same time, recycling increased 20% in two months from 20-cubic yards to 24-cubic yards and after three months increased 25% resulting in 25-cubic yards of recyclable materials. After two months, composting increased 33% from 3-cubic yards of materials to 4-cubic yards and after three months increased 66% resulting in 5-cubic yards of compostable materials.

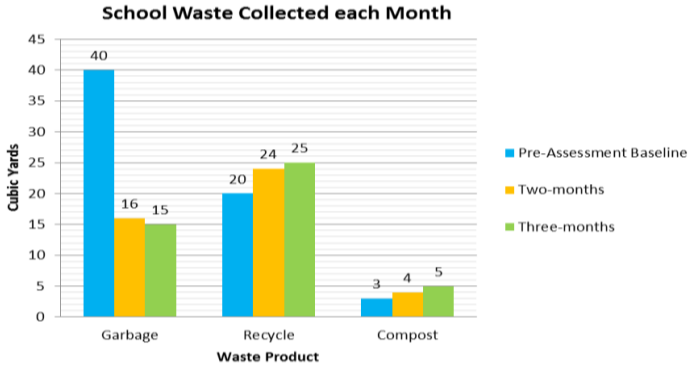

Figure 2. *School waste products.*

In Figure 3, data from the Waste and Recycling Assessment and Characterization Audit identified the number of bins in the cafeteria full of waste products each day. By the end of

the second and third months, there was an extreme reduction in waste from fifteen 44-gallon bins of garbage a day down to one 44-gallon bin a day. There was a significant increase in daily recycling in the cafeteria. The results revealed at the end of the second month; recycling increased 400% and by the end of the third month increased 500% since the pre-assessment baseline.

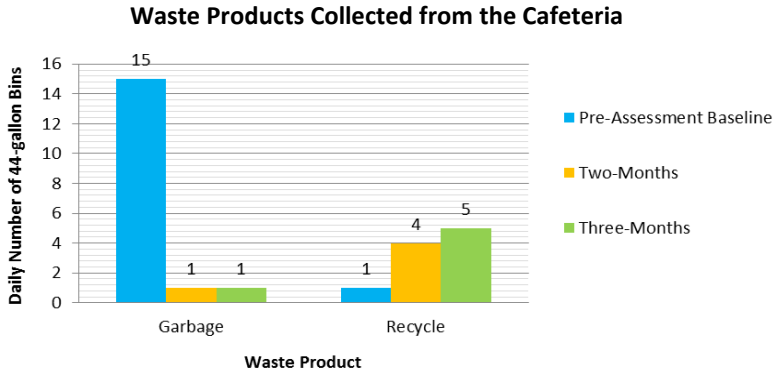

Figure 3. *Cafeteria waste products per day.*

Discussion

Based on the findings, the biggest factor that influenced the decline in the garbage consumption was recycling milk and juice cartons in the cafeteria as well as eliminating Styrofoam trays. In addition, each bin in the cafeteria was color coded and marked clearly, so students knew where to put each waste product. To reduce items being accidently deposited in the incorrect waste bin, the Green Team students were available in the cafeteria daily to help other students with proper placement of waste products.

Significance of Decreasing Waste: Sharing the Results

The fifth step in completing the certification was to share the journey and results with stakeholders as well as the community to inspire others to make a difference. Therefore, a school-wide assembly was organized inviting students, staff, parents, the media, and community members to attend the celebration of accomplishments. Students shared what they learned through artwork, poems, and their student written and performed skits. Real-world learning enabled students to apply theory to practice and built interpersonal skills critical for sustainability (Redman, 2013).

The final step in becoming certified was to review the Washington Green Schools report card, which was a summary page that tracked the progress in each category. After meeting the requirements and the lasting change verified, the application was submitted to Washington Green Schools for approval. Once successful, the school became certified through Washington Green Schools (Washington Green Schools, 2015).

The significance of the study identified barriers and improvements that resulted in the recycling and composting of waste at an educational setting. The improved conservation practice reduced depletion of natural resources making it possible for ongoing changes. Stakeholders had an opportunity learn how to identify and reduce waste while at the same time preserving the environment.

There are benefits to an eco-friendly school setting. Schools can conserve valuable resources, reduce environmental impact, save money, and cut down the amount of waste

generated by recycling and composting (Colliver, Bishop, & Caristo, 1999). Teachers in Washington State have the necessary resources to support integrated environmental and conservation education learning opportunities for each student.

Through teaching, training, and working together to support environmental issues, steps were taken to reduce waste at school. Students made a lasting change by participating in a school-wide recycling and composting program. There were resources available for stakeholders to implement throughout a school setting. This lasting change allowed students to discover practical solutions to reduce waste. Therefore, the goal was met by increasing recycling and composting while decreasing garbage. The next area for improvement includes implementing lasting change throughout the entire school setting and surrounding grounds.

Conclusions

It takes a team to develop and implement change within the school community. The school's Green Team introduced something important which united the students and staff. Stakeholders took action resulting in behavioral changes that taught, modeled, and practiced waste reduction. Educating students on ways to take care of the environment started with making small changes. Students developed and applied the knowledge and skills needed to make decisions while promoting green solutions.

The outcome of this study provided insight and information on how elementary students reduced waste within a brief time. Based on the results, a lasting change program can improve the way a school manages waste products. This short-term milestone aided in taking the first step to making a difference at a Title I elementary school. Best practices in the community will also continue to evolve and allow for effective outcomes that translate into successes in education (Shriberg & MacDonald, 2013). In the future, recycling programs may help school communities to meet conservation needs and show greater improvements in becoming eco-friendly while reducing the depletion of natural resources.

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A General Investigation of the In-Service Training of English Language Teachers at Elementary Schools in Turkey

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Abstract

This study presents a critical diagnosis of in-service teacher-training activities offered to English-language teachers in Turkey and aims to investigate whether those teachers are satisfied with the activities. Thirty-two English-language teachers participated in this study. Data were collected from 32 elementary-school teachers of English as a foreign language, using a general evaluation form prepared by the researcher. The results indicate that the teachers are not satisfied with their in-service teacher-training activities and that in-service training does not fulfil their needs. The study also proposes an in-service teacher training model in distance format.

Keywords: In-service teacher training, English language teachers, Elementary school education.

Introduction

'Continuousness' is the basic concept underlying 'lifelong education.' High-quality education is based on teacher quality, and 'continuousness' is one of the most important factors in teacher training. 'Continuous Professional Development—CPD' consists of four similar parts: 1) pre-service or initial teacher education; 2) in-service teacher training (INSET); 3) further education; and 4) vocational training/education, which is the underlying principle of 'lifelong education' (ECA, 2006, p.7). The constant vocational training that takes place during teacher training is categorized as either pre-service or after-service. Studies indicate that the pre-service teacher-training programs are inadequate to provide a sufficient set of skills (Can, 2005; Lucas & Unwin, 2009). Thus, teachers need INSET to fill in the gaps from pre-service training and for continuous professional development, which keep teachers up-to-date throughout their careers with respect to the skills required in a contemporary knowledge-based society.

Ryan (1987) mentions that INSET refers to any type of activities such as courses, and seminars related to the job. In this sense, any kind of teacher training activities such as short courses, seminars, workshops, certificate/diploma programs and postgraduate

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programs, which result in professional development of teachers, are regarded as a part of INSET.

INSET in Turkey

INSET varies significantly from one country to another because each country has its own policies. In Turkey, the first organized INSET began in 1960 with the establishment of the 'Office of Training Teachers on the Job' in the Ministry of Education (ME). This office became the 'Department of In-Service Training' in 1975, but the centre was only able to provide training to a limited number of teachers because of financial difficulties and inadequate office space. The Ministry of Education has combined the approaches of the local and central administrations and since 1993, it has continued to provide a practical in-service teacher-training program for large groups of people. Since 1993, central in-service trainings in Turkey have been conducted by the Ministry of Education's Department of In-Service Teacher Training, and local trainings have been conducted by the Provincial Directorates for National Education (PDNE). The training activities are arranged cooperatively by the ME and the PDNE and are conducted face-to-face, either centrally or locally. A current list of the INSET courses (in Turkish) is presented on the official page of ME (edb.meb.gov.tr/net/_standart_program/index.php?dir=Standart+Programlar%2F). In-service training seminars are arranged by taking the location of the teachers into consideration. The duration of the courses can vary, but they generally last for approximately 25 to 120 hours. The courses are led by instructors at the ME or PDNE; instructors from nearby universities occasionally deliver the lectures. The content of each course is determined by the instructor. At the end of the activity, the participants are asked to fill an evaluation or feedback form.

It is important to note that INSET refers to any in-service teacher training activities organized by ME and PDNE.

INSET for English language teachers

Turkey, has been implementing educational reforms for years. Recently, a radical change called 4+4+4 was introduced to the Turkish education system. This new system, aims to divide the educational system into three main periods (primary/secondary/high school), increase the compulsory education period to the average established in EU and OECD countries and provide higher quality education. This new system has also been accompanied by new reforms in the teaching of foreign languages, such as starting foreign language learning at an early age, specifically, at the primary school level. This change has increased the importance of not only 'teaching English as a foreign language' but also the 'quality of English-language teachers.' To teach effectively, an English teacher must possess both adequate subject-matter knowledge and the required skills. However, elementary-school English teachers have been found to have difficulties teaching young learners (Haznedar; 2003; Hüttner, Mehlmauer-Larcher, Reich & Schiftner, 2012; İşpınar, 2005; Khandehrou, 2011; Lamie, 2002; Nicolaids & Mattheoudakis, 2008; Salı, 2008). Teaching English to elementary-school students requires special knowledge and pedagogical skills related to the new curriculum: language acquisition and development among young learners; teaching methods and techniques; the effective use of audiovisual materials; understanding individual differences and collaborative learning; and classroom management (Akyel, 2003; Güven, 2005; İşpınar, 2005; Olivia, 1968; Öztürk, 2006). The needs of English teachers who instruct young learners are different from those of teachers who instruct older learners (Akyel, 2003; Güven, 2005; Özdemir, 1998). Therefore, INSET's content for elementary-school English teachers should be unique (Reilly & Haworth, 2001). The literature also supports the idea that elementary-school teachers of English as a foreign language require training in a variety of subjects (Al-Mutava, 1997;

Chacon, 2005; Eslami & Fatihi, 2008; Hazneder, 2002; Krol et al., 2004; Özbay, 2009; Özdemir, 2007; Polat, 2010; Salı, 2008; Sevinç, 2006; Symeonidou & Phtiaka, 2009).

That notwithstanding, Turkey's INSET programs primarily cater to general classroom teachers (Çiftçi, 2008; Demirtaş, 2008; Maral, 2009; Şahin, 1996), science teachers (Kanlı, 2001; Kaya et al., 2004; Tekin & Ayas, 2006), and preschool teachers (Kıldan & Temel, 2008; Uşu & Cömert, 2003). English teachers are offered very few opportunities to participate in INSET. Indeed, teachers' subject areas are ignored when organizing INSET programs. Therefore, current INSET practices are ineffective and fail to meet all teachers' needs (Coşkun, 2014; Division of Research & Development in Education (EARGED), 2006; Önen et al., 2009).

To develop their subject knowledge, gain the required skills, and become knowledgeable about current technological developments, elementary English-language teachers must be trained sufficiently to achieve effective foreign language teaching and learning in the classroom. Little research has been conducted to evaluate the professional training programmes offered to ELT teachers (Cooper & Keefe, 2001; Owsten et al., 2008; Young & Lewis, 2008). This study aims to investigate the experiences of elementary-school English-language teachers' experiences who have participated in INSET activities offered by ME and PDNE. The underlying research question is:

What are the perceptions of English language teachers at elementary school about INSET activities offered by ME and PDNE?

Methodology

Participants

The participants in the study are 32 elementary-school teachers of English as a foreign language who have participated in various INSET activities organized by ME and PDNE. The teacher's amount of teaching experience differs from two years to 22 years. 25 of them are female and 7 of them are male.

Data collection tools and procedures

Aminudin (2012) mentions five features of effective professional development: content focus, active learning, collective participation, duration and coherence. These features were taken as core concepts when constructing the items of the present questionnaire. Besides, the items of the INSET Evaluation Scale developed by Tekin and Yaman (2008) for science teachers were adapted.

To obtain a general view of English-language teachers' perceptions of INSET activities, the researcher prepared an evaluation form consisting of three main parts. The first part included questions about the teachers' demographic information, such as their gender and level of teaching experience. Research has confirmed that there is not a significant difference between the impact of professional development in classroom practices and years of experience (Robinson, 2011), and that there is no significant correlation between satisfaction with professional development and age of the teachers (Hustler et al., 2003). Therefore, further statistical analysis regarding these variables was not conducted.

The second part included eleven statements related to the INSET activity's content, instructor, and evaluation. In the last part, the participants were asked to write a detailed account of their experience related to their participation in the INSET activity.

Data analysis and data collection

The questionnaire data were analysed descriptively using a statistics program. Item analysis was applied, which means the frequencies and percentage scores of each item were calculated. The scores for 'strongly agree' and 'agree' were merged and defined as 'agree.' Similarly, 'strongly disagree' and 'disagree' were merged and scored uniquely as 'disagree.'

The evaluation and intent forms were attached to an email sent to state elementary-school English-language teachers, soliciting them to volunteer to participate in this study. Out of 102 teachers, thirty-two of them responded positively.

Results and discussion

A very significant finding of this study is that more than half of the teachers (62.2%) indicated that the INSET activities were not relevant to their needs. Many studies have come to the same conclusion: teachers' real needs have not been met by INSET activities (Çiftçi, 2008; Çimer et al., 2010; Gökdere & Çepni, 2004; Karagöz, 2006; Önen et al, 2009; Özer, 2001; Öztürk & Akar; 2005). Content-focus is one of the most important features of an effective INSET activity (Aminusin, 2012; Birman, Desimone & Garet, 2000). In the same line, content-specific INSET activities are reported to be their most beneficial professional development experience by teachers in a variety of studies (Aminudin, 2012; Robinson, 2011)

Similarly, research by Education, Research and Development (EARGED, 2006), which was conducted in 14 provinces and gathered data from 1067 teachers, revealed that INSET is neither efficient nor effective at fulfilling teachers' educational needs. One possible reason for this dissatisfaction is that in-service training activities have not taken into consideration teachers' various ranks (Gökdere & Çepni, 2004).

Most of the teachers (65.1%) indicated that the content covered in the INSET activities was clear and comprehensive. However, most reported that the INSET activities were not motivating (67.9%) and did not allow for active participation (79.6%). These findings are supported by similar research, which has found that the methods applied during in-service training are neither efficient nor proper (Çalgan, 2008; Çimer et al., 2010; Öztürk & Akar, 2005), nor are they motivating (Çimer et al., 2010). The reason that the INSET activities are not motivating and interactive could be related to the lecturers' teaching approaches and teaching abilities in the field. This assumption is supported by research that finds that INSET instructors are not necessarily leading experts in the field (EARGED, 2006; Çimer et al, 2010; Özer, 2001). In this line, Harland (2014) suggests that INSET based on constructivist approaches is more effective. Similarly, related literature reveals that the tools and materials used at INSET training have not been updated to meet recent scientific and technological developments (Taymaz et al., 1997) this could provide another reason that INSET is not motivating.

Another finding of this study is related to the evaluation of INSET activities. The findings of the present study revealed that only 39.3% of the teachers think that the evaluation process for INSET activities is satisfactory. This could be due to the fact that out of the four evaluation steps, only the 'Reaction' step is achieved through disturbing an evaluation form to the teacher participants, which is the cheapest way. On a related note, the teachers stated that they could not apply the knowledge from their INSET activities in their classrooms. This finding is supported by Kanlı (2001), who finds that teachers were not able to actualize the knowledge that they gained. Similar studies have also found that the end-of-training assessments are inefficient and not scientific (EARGED, 2006; Çimer et al., 2010; Taymaz et al., 1997). Taken together, these findings indicate that the

'Assessment' period constitutes another deficiency of MEB and PNDE's in-service trainings. The teachers' success is not evaluated at the end of the training; instead, they are asked to evaluate the INSET activity in which they have participated. According to Kirk Patrick (1959) there are four steps for evaluating a learning process. : Reaction (How well did the learners like the learning process?), Learning (the extent to which the learners gain knowledge and skills), Behaviour (capability to perform the newly learned skills)and Results (investigation of the noticeable results of the learning process in terms of reduced cost, improved quality, efficiency, etc). The purpose of an in-service teacher-training program is to enable teachers to develop their knowledge, apply this knowledge in the classroom, and achieve the projected behavioural changes. To effectively measure the program's success, the teachers' behaviours and knowledge levels both before and after the in-service teacher-training program should be compared. If the teachers' knowledge level has increased, if they display the projected behaviours, and if they can apply the acquired knowledge in the classroom, then the in-service teacher-training program is successful. However, in the training activities conducted by the ME and PDNE, no assessments of the teachers are made either during or at the end of the course.

In addition to their responses to the statements on the second part of the evaluation form, the teachers were asked to write about a personal experience in an INSET activity on the third part of the form. One example of a response (from a female teacher) is stated below. She indicated that although she did not find the INSET experience useful, it was interesting to meet different teachers around Turkey and share ideas. She also suggested that the group size during training should be small.

> *'A few years ago, I participated in an INSET activity titled 'English Teaching Methods and Techniques.' It was a weeklong seminar, and I found it partially useful. I do not think that the content was different from the training I received during my undergraduate education at the university. In that sense, the INSET program did not add to my current knowledge. One thing I liked about the seminar was that I had the opportunity to meet other English-language teachers from other schools and other cities, and we were able to exchange ideas. However, the group was very crowded. I think it would be more effective if the group size was smaller.'*

Similarly, another teacher mentioned her negative INSET experience in regards to the course instructor.

> *'I have been teaching for 14 years. So far I have participated in three INSET activities. However, I do not think that these either have added to my current subject knowledge or have helped to develop my teaching skills. One of the courses I participated in was 'Methods and Techniques in Practical Speaking' organized by PDNE in Balıkesir. It was a five-day seminar. The course instructor was a friend of mine. She participated in the same seminar organized by ME in Ankara, and she was tasked to be instructor of this seminar in Balıkesir. It is a well-known fact that most of the English language teachers are not very good at practical English. So, how could such a course instructed by my friend can be effective? Such courses should be instructed by native speakers of English. What is more, English language teachers should be provided with opportunities to participate in INSET courses abroad.'*

Conclusion

This study aimed to investigate English-language teachers' perceptions of the INSET activities offered by the ME and the PDNE, which have played a very important role because they are the only government agencies in Turkey to offer in-service teacher-training programs. Significantly, this study's findings are consistent with the findings of similar studies in related areas and reveal that the in-service teacher-training programs run by the ME and PDNE are ineffective and do not fulfil the needs of elementary-school English-language teachers.

In this line, the findings of the present research could be used for the continued development of in-service English language teacher training, and in turn for increasing the quality in foreign language teaching at primary schools in Turkey. Another importance of the findings of the present research for the continued development of language teaching in Turkey is that the present study could provide a database for future research in Turkey, which could provide Turkish authorities and stakeholders such as Ministry of Education Department of In-service Teacher Training and the Provincial Directorates for National Education (PDNE) with the information to understand the underlying reasons for such needs, and in turn create possible solutions for language teachers' professional development.

The present study is significant in that it has confirmed that the INSET model used by ME and PDNE is not effective for professional development of English language teachers.

Taking the two facts into consideration; that INSET plays a vital role in teachers' professional development, and that the in-service training offered by the ME is not effective, this study suggests an urgent call for developing new INSET activities based on the needs of English language teachers in Turkey and proposes a new INSET Model.

The proposed new model is based upon the characteristics of what makes a high quality of INSET programme and distance education. It will both provide a more effective training for English Language teachers and also set a good example model for in-service training programs implemented in other subjects. The components of the newly proposed in-service teacher training model are:

1) Needs Analysis: Identification of needs is the most important issue for the success of a programme (Daloğlu, 2004; O'Sullivan, 2001; Ruba, 1985). So, needs analysis, which is the basic part of developing a programme, is very significant in that the results of it will provide INSET programme developers with the necessary information to design a course specific to English language teachers' needs.

2) Distance learning mode: The main reason why INSET should be offered by distance is that distance learning is flexible in terms of time and place, therefore enables a wide range of English language teachers to be trained. In Turkey, many state universities have postgraduate programmes in ELT, which are offered face-to-face. However, when teachers in rural areas are considered, face-to-face format does not seem to provide every teacher with the opportunity to be trained professionally. INSET by distance education could minimize this limitation.

3) Cost of free online INSET: INSET (offered by higher education institutes and accredited private language schools) in most countries require a course fee, which all teachers may not afford. In order to provide professional development opportunities for a wide range of English language teachers, online and cost of free in-service teacher training should be offered.

4) Collaboration between The council of Higher Education and the Ministry of Education (MEB): Designing an online programme has 'educational' and 'Organisational' aspects. The educational aspect requires collaboration of a variety of subject experts in the field of English language teaching, educational technology, programme development, and distance education, which could be achieved under the responsibility of the council of Higher Education. The Ministry of Education could participate in collaborate by implementing the programme, and acting as a liaison between the teachers' and the council of Higher Education.

5) Active participation: According to 'Interactive learning' and 'social-constructivist' theories, the more interaction occurs among the components of the programme (student-materials-instructor), the more efficient the learning will be. Richness of the social environment of the individual is an important factor and it is very significant for the individual to learn effectively to be involved in an interaction with this environment. Designing education contexts involving different types of interactive treatments, which allow students to communicate more among their peers and the course materials may lead to effective teaching, and thus increase the effectiveness of distance education (Beldarrain, 2006; Moore, 1989). In line with this approach, teachers should be provided with opportunities for maximum interaction, and therefore learn actively in an interactive environment Online-mentor support: Another important factor for effective learning is the concept of 'scaffolding' (Vygotsky, 1978). It refers to learning with the help of someone who has more information and is more experienced. It is very important that the experts at the English language teacher training departments of the universities take the role 'mentors' in the proposed INSET program. In the proposed model the mentors are responsible to provide online constant and configured consultancy service for the teachers attending the distant in-service training program by giving feedback on teachers' lesson plans, and their teaching performances in the classroom, making explanations to the questions about the points of the content of the subject. Besides giving feedback, the mentors are also responsible for continuous assessment of teachers via e-portfolios, which include sample lesson plans and video recording of teacher classroom performances. In this sense, it has been hypothesized that continual online mentor support during the in-service training could result in effective learning.

6) Assessing the impact of INSET: The purpose of the in-service teacher training is to develop the subject knowledge of the teachers and also to change their teaching behaviours positively. The proposed model accepts Kirk Patrick's four-level evaluation model. For short term assessment (Reaction), which is also considered as the general evaluation of the programme, interviews and evaluation questionnaires can be used to evaluate INSET from a general aspect. The new model uses pre and post assessments to investigate the extent to which teachers gain new knowledge (Learning). That is teachers' subject knowledge and teaching skills should be assessed prior and then after the INSET. To determine whether any changes in the teaching behaviours have occurred (Behaviour), teachers are observed for an extended period of time after the INSET activity. Such assessment could give information about the 'long-term impact' of teachers, which is an aspect ignored by programme developers.

This study also suggests that further research studies should be conducted through a collaboration between the ME, PDNE, and related departments of the universities to develop and implement new in-service teacher-training models. The application of more

effective models for in-service English-language teacher training will both improve the quality of the teachers and increase the achievements of foreign language students.

This study investigated the perceptions of English-language teachers at the elementary-school level. A future study could also examine English-language teachers at the secondary and high-school levels and investigate whether the three groups of teachers differ significantly in relation to their perceptions about INSET activities. A second suggestion should be proposed for a research that gathers qualitative data that provides a deeper understanding of the weaknesses of current INSET programs.

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APPENDIX 1

General Evaluation Form for INSET Activities (English-Language Teachers)

Part A. Demographic Information
1. Gender: □ Female □ Male

2. How much teaching experience do you have?

□ 1-3 years □ 3 - 5 years □ 5-10 years □ 10+ years

3. Which age group of students do you teach? (You may select more than one option.)

□ Elementary □ Secondary □ High school

PART B. Please indicate the extent to which you agree or disagree with each statement below.

		1	**2**	**3**	**4**	**5**
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
No.	**Statement**					
1	The INSET activities (seminars/workshops, etc.) were relevant to my needs.					
2	The lecturer was well prepared and an expert in the field.					
3	The INSET activities were engaging and interactive.					
4	The INSET activities allowed for active participation.					
5	The INSET content was well organized.					
6	The INSET content was clear and comprehensive.					
7	The INSET activities (seminars/workshops, etc.) added new content to my current knowledge base.					
8	The INSET activities (seminars/workshops, etc.) provided me with new skills to add to my current language teaching skills.					
9	I can apply the knowledge and skills I have gained in the INSET activities in the classroom.					
10	The overall evaluation of the INSET program was satisfactory.					
11	The organization of the INSET program was satisfactory.					

PART C. Please comment on your personal experience with the INSET activities.

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Efficacy of the Arts in a Transdisciplinary Learning Experience for Culturally Diverse Fourth Graders

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Abstract

The aim of this participant observation was to understand the efficacy of a modified International Baccalaureate Primary Years Program for fourth-graders at a public school with a large percentage of language and socioeconomically disadvantaged students. Data collection over a five-month period concentrated on teaching interactions including audio-recorded time samplings and observations of the art and regular classroom instruction, and interviews (formal and informal) with students, teachers, and school principals in addition to photographs, classroom portfolios, and other artifacts. The analysis, coding, and triangulation of data aided in understanding the art specialist and classroom teachers' roles and contributions to the Primary Years Program. A cooperative school environment paved the way for student self-confidence and motivation for learning through (1) opportunities for student choice and decision-making and (2) collaborative, inquiry-based, transdisciplinary, project-based learning. Regardless of demographics, transdiciplinary learning through the arts challenged and motivated students to think and make decisions in collaboration with others, using and valuing the expertise of peers. Regardless of student ethnicity or socioeconomic status, learners felt empowered and enthusiastic about attending school and gained knowledge through inquiry and project-based opportunities. This progressive ideology and practice has the potential to benefit diverse learners in 21st century education.

Keywords: IB, Transdisciplinary, Project-based, Art, Diversity.

Introduction

The International Baccalaureate (IB) Primary Years Program (PYP) originated 19 years ago in Geneva, Switzerland, and was based on the International Baccalaureate (IB) Diploma Program for high school students. The mission of the PYP was to:

> develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect. To this end the organization works with schools, governments and international organizations to develop challenging programs of international education and rigorous assessment. These programs encourage students across the world to become active, compassionate and lifelong learners who understand that other people with their differences, can also be right. (IBO, 2010)

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Learning in the PYP promotes an overall international-mindedness in the study of arts, science, mathematics, social studies, language, and physical and personal education through school wide curriculum inquiry ideas: Sharing the planet, Who we are, Where we are in place and time, How we express ourselves, How the world works, and How we organize ourselves. Action and Exhibition/Summatives, to be explained later in this paper, are important components of these inquiry directives, as well as the encouragement of desired student attributes and traits such as thinker, caring, and open-minded, to name a few. Yet, schools' implementation of these concepts vary.

Becoming a recognized PYP requires an application process and fee, teacher training, regular program evaluations, and additional qualifications, often a daunting task for schools with limited resources and finances. Progressive administrators can seek and acquire funding to initiate and sustain their school's participation in the program regardless of its demographics and economic status, such as the PYP described in this study.

It is also common for art educators to think that the PYP is similar to the Diploma Program, and only includes exceptional students with a high socioeconomic status (Anderson, 1994; Blaikie, 1994; Frazer, 2005). In contrast, the PYP includes all students such as the participating school in this study, regardless of academic skills and achievement. This could be why research publications that focus on art education in the (IB) Primary Years Program (PYP) are uncommon. Most studies of IB PYPs are outside of art education literature (Humphrey, 2004; Martina, 2005; Stillisano, Waxman, Hostrup, & Rollins, 2011; Twig, 2010) and are particularly sparse in the study of public schools with disadvantaged or minority populations (Frank, 2009; Hemelt, 2014; Humphrey, 2004). One study by Stillisano, Waxman, Hostrup, and Rollins (2011) does identify insights from teacher interviews at ten culturally and socioeconomically diverse PYP and MYP programs in Texas. The benefits suggest "improved professional practice, instructional focus on higher level thinking and learning, cultural awareness, and relevance of student learning" (p. 181). Research presented in this paper attempts to reveal PYP's potential with a similar student cohort, but through an ethnographic approach, enabling the observation and recording of classroom interactions and reflections of teachers and students over a five month period.

The objective of this research is to better understand the role and efficacy of visual arts across the curriculum in an International Baccalaureate (IB) Primary Years Program (PYP) at one public elementary school in the United States with a large percentage of disadvantaged[1] students. Since implementation of the IB program over a three year period (2008 to 2011), there had been steady progress in standardized test scores, fewer discipline problems, and an improved rate and interest in school attendance based on what the Vice-Principal referenced from a 2011 final report to the Care Foundation. According to the Principal, "Kids don't want to miss school. They don't want to be pulled out . . . for a doctor's appointment anymore." Some say, "We're making presentations today," and are gratified that their work is valued. A direct correlation between the IB program and certain positive quantitative measurements in test scores or other factors cannot be drawn, but I believe that this qualitative study offers significant insights into the effectiveness of Westwood Elementary School's PYP. Although some of these findings might be unique to the school's population of students and the teachers' approach to the PYP curriculum, the program's general efficacy suggests it might be applicable to other schools with comparable demographics.

Participant Observation as Research Methodology

Westwood Demographics. During a five-month study at Westwood Elementary School, of the 75 fourth grade students participating, 55 percent were Latino. Caucasian students included 37 percent of the population, and 7 percent were Pacific Islanders. Of the fourth-graders, 83 percent qualified for the free and reduced lunch program with 55 percent noted as Limited English Proficiency (LEP), and 9 percent needed special education. By the end of the 5th grade only 36 of 80 had attended Westwood since kindergarten due to a high rate of student mobility. The public school is located in Northwest Arkansas, a region with a dramatic Latino population growth over the past 20 years. Since the 2000 Census, the Latino population in the county increased another 143.3 percent (UALR Institute for Economic Advancement, 2011).

Methodology

Unlike many statistical measurements of school performance, this participant observation[2] concentrated on the teaching interactions where learning took place. The data included audio-recorded time samplings and observations of the art and regular classroom instruction, interviews (formal and informal) with students, teachers, and school principals in addition to photographs, classroom portfolios, and other artifacts.

My analysis of data began with content and comparative analysis[3]. Then, I identified and interpreted how the fourth graders responded to the curriculum and instructional strategies using Strauss and Corbin's (1990) method of data coding and Miles and Huberman's (1994) suggestions for charting categories and axial coding. The triangulation of data (using three or more sources of evidence) aided in understanding the art specialist and classroom teachers' roles and contributions to the PYP program that appeared to affect student learning. I focused on what motivated student learning inside and outside of the art classroom and on the school's approach to PYP curriculum as a transdisciplinary[4] opportunity for students to create deep understanding, the highest level of Erickson's (2007) structure of knowledge, based on Anderson and Krathwohl's (2001) revision of Blooms taxonomy of education objectives, to prepare students for success in the 21st century.

The IB Program Standards and Uniqueness at Westwood

The PYP at Westwood had standard transdisciplinary (Nicolescu, 2002) guiding concepts: (a) Who we are, (b) Where we are in place and time, (c) How we express ourselves, (d) How the world works, (e) How we organize ourselves, and (f) Sharing the planet. Within each grade level's units of inquiry, teachers created conceptually based central ideas for enduring understanding based on Arkansas state curriculum frameworks and adapted the transdisciplinary concepts and approaches of inquiry to their learning community.

Westwood Elementary had a modified application of the PYP. Extensive collaboration between classroom and specialist teachers carried unit concepts across disciplines and encouraged student choice in learning. For example, classroom teachers collaborated with students, offering them options for *summative*[5] presentation topics with open-ended format possibilities for how they would present new knowledge. Students were also involved with developing and adjusting the assessment rubric early in the unit. These choices and involvement linked to students' interests and challenged them to think critically and be invested in both learning and assessment. Classroom teachers provided an array of reading resources, library books, Internet sites, field trips, guest speakers, etc., that related to the unit and student reading levels. In the art class, conversations centered on topics that students had explored in their regular classroom and how these related to their artwork. Students learned how art connected to other disciplines and helped them

gain a global understanding. Art curriculum encouraged them to think critically, and create work using personal choices in subject matter, media, and style.

PYP programs list desired student attributes (learner profile) that are referred to and reflected on by teachers and students: inquirer, communicator, caring, risk-taker, thinker, balanced, open-minded, knowledgeable, reflective, and principled. Westwood applied two more: quality producer and community contributor. According to Westwood's Principal "separating them [the roles] out helped to communicate to students and parents." Students' application of them is referenced in their reflections later in this paper.

The units of inquiry that I observed included where we are in place and time, sharing the planet and how the world works. The central idea (lines of inquiry) identified as Westwood's fourth grade units were Features of a region influence human settlement patterns, Humans have a responsibility for the equilibrium of the planet, and Humans predict, impact, and adapt to climate change. Classroom teachers and specialist teachers met regularly to integrate the concepts of transdisciplinary curriculum and to build on Erickson's (2007) enduring understanding. The ultimate goal was to transfer inquiry and deep understanding into a creative student artwork and collaborative or independent project-based presentation in the regular classroom referred to in the PYP as a summative. The summative topics at Westwood were chosen by the students, researched, analyzed, understood, and transformed into a creative format utilizing students' artistic skills, which they developed in art classes, including problem-solving and innovative uses of recycled materials. The process of creating a summative from a central idea through the research inquiry and idea formation gave students opportunities to apply multiple learning styles and cross-disciplinary knowledge, allowing them to use their areas of expertise, as Gardner (2006) referenced in his multiple intelligences theory. Group collaboration involved sharing and learning from others through cooperative learning (Kagan, 2009; Jacobs, Power, Wan Inn, 2002; Putnam, 1998). Teachers and students also had a voice in the development of assessment rubrics for the summative and reflections on them, setting their own goals.

21st Century Learning at Westwood

Four important factors in 21st century education that are promoted by PYP programs worldwide were evident at Westwood: teacher and student collaboration, critical thinking, global awareness, and transdisciplinary action. Erickson (2007) asserts, "the survival of a society depends on its ability to respond intellectually and creatively to social, economic, political, and environmental problems" (p. 15). Westwood embraced this focus, and promoted collaboration at three levels, between: (a) the classroom teacher and art specialist, (b) the teachers and students, and (c) the students. All teachers encouraged critical thinking, frequently using open-ended questions in the classroom to guide learning and required students to formulate their own questions. Teachers provided a variety of curriculum resources that included global, national, and local information. Transdisciplinary action took the form of creative formative and summative project-based presentations (comic books, plays, songs, Powerpoints, architectural models, etc.) based on student topics of interest within the parameters of the curriculum concept. These creative demonstrations of knowledge encouraged student peers to empathize with historical or cultural issues and take social, economic, political, or environmental action.

An Environment That Promoted Self-Confidence and Motivation for Learning

Faculty and staff mentioned students' change in confidence and motivation since the implementation of the PYP at Westwood. The data analysis indicated that these two factors made significant contributions to learning and are interlinked according to Kitsantas and Miller (2015). Their study of characteristics of students' self-efficacy and

self-regulatory development suggest that "building confidence is an important component of student motivation" (p. 58). Both are addressed below as factors for enhancing learning experiences.

Self-Confidence

Self-confidence seemed to emerge through three generalized categories (1) peer support and risk-taking, (2) recognition of multiple intelligences, (3) questions-as-suggestions, and (3) global sensitivity. Insights on these program attributes offer some significant links to self-confidence in this particular IB PYP.

Peer Support and Risk-Taking

Self-confidence emerged through peer support and risk-taking. Students affirmed that they helped each other in the art room and in other classes. One said, "The other day when I was in Spanish class, Alicia didn't want to go up there [in front of the class] and I told her if she went up there, I'd go up there with her. And she started feeling more confident about herself. Now, she wants to go up by herself every time." Some students agreed that art increased their self-confidence and risk-taking. One said, "Some people, who are really good at drawing that, [will say] you can just try and you'll probably get it." They concurred that art class helped them to believe in themselves. When I asked them how that happened, one boy said, "Every time I mess up something, I try again. When I get it wrong, I try again and again. So, I never give up." When students succeeded, peers acknowledged it, such as compliments given to a student who won a regional art show. Even though his parents failed to attend the art show or fully recognize their child's accomplishment, most fourth grade students, teachers, and administrators at Westwood did. According to the Principal, students who felt competent in art pridefully used those skills for summative presentations in their regular classroom. Students who transferred to Westwood from other schools claimed that helping each other didn't happen (at the other school). You were an individual on your own without an opportunity to gain confidence. At Westwood, "You're not by yourself and you learn how to work with others." One student said, "When there's a new student, they always need help on stuff. So, I go help them." The art teacher recognized success in student work and encouraged them to share their conceptualizations with others through their art and offer suggestions that were positive and helpful.

In the regular classroom I witnessed students helping each other research, construct props, models, and drawings, and make decisions for their summative from peer and self-critiques based on established rubrics. One student checked out a library book from the public library for another student's summative. They asked for formative feedback from peers, "Should the corn be curled up?" Students who had experience using Powerpoint, or spelling/reading assisted those in or outside of their group collaborations. Students were respectful when others were reading as part of a group summative, and co-presenters helped those who struggled to read. One who independently developed a play for his summative asked other students in the class to act out the parts with him. Through this supportive atmosphere, everyone grew in their ability to read and speak in front of others. Even with the challenges students encountered while reaching collaborative agreements, they realized its real world application, solving problems through collaboration, not in isolation.

Recognition of Students' Areas of Expertise

The students' supported each other, and their mutual recognition of peer expertise improved confidence. It was common to see a pat on the back with the comment, "Nice job!" and "That's cool, I like the background color," or asking others for suggestions, "Do

you think I should add buildings here?" They also realized their own successes and areas of expertise. "I like mine now. See the eye? It catches the light." One student told me while working on a summative in their regular classroom, "I'm kind of an artist of cars and air balloons. Haley, she's an artist of people. Me, Jake and Ameliano, we draw cars." Expertise in art was enthusiastically shared with peers. When students studied weaving in art, they collaborated and had team leaders who assisted others. One boy who was the master weaver was proud to tell me that his father taught him to weave purses, etc.

Teachers gave students opportunities to use various learning styles or intelligences. According to Simmons (2001), this type of recognition of students' multiple intelligences can promote self-esteem. According to a classroom teacher,

> During our frontloading and formative assessments for our IB units, as well as during literacy, I expose the students to many different types of learning styles. For example, when teaching the students about global warming, I don't expect them to read the science textbook, answer some questions, and take a test. Instead, we learned some basic information about global warming, as well as about Public Service Announcements [PSAs]. We viewed some PSAs online, and then the students got to choose groups and perform their own global warming PSA. Giving them this freedom allowed for self-expression and the opportunity to combine various learning styles within a group. Some students created posters, others performed a rap or song, while others included some drama.

Teachers agreed that students had more opportunities to show what they learned through various types of activities often requiring a combined group effort of skills/intelligences. Students were also encouraged to be risk-takers and use a variety of learning styles, not stick with the one they do best. A teacher acknowledged that if she had a student who was extremely knowledgeable about the unit's central idea and could best communicate that knowledge through drawing or acting and speaking, she gave them that opportunity, and they felt more competent and valued. The classroom teachers agreed that many students "engage particularly well in visual activities or in the arts because their vocabulary might be lacking if expected to write five paragraphs on a topic." Strengths and weaknesses varied, and were not culturally distinctive, but often reflected home experiences and prior knowledge. Regardless, acknowledgement of students' expertise seemed to improve their confidence and encouraged growth in other skills.

Teachers Used Questioning and Focused on the Positive

Teachers' use of questioning and focus on the positive supported self-confidence. Based on evidence in the art and regular classroom and on what the Principal witnessed, teachers avoided giving students negative feedback. Instead of affirming that students were "wrong," teachers used open-ended questions to guide students in learning with thought-provoking questions. Positive feedback and questions-as-suggestions led to deeper comprehension than simply regurgitating information or taking a teacher's specific directive. For example, the art teacher told a student, "This looks really good. If you look at it you've got some interesting choices. What color could you put in here that could really pull this all together?" On another occasion, she said, "How did he [van Gogh] show that it was a sunrise and he was sewing seeds? How did he do that? What did you do when you used tempera paints?" The student responded with a better understanding of his own use of layering colors. A classroom teacher wanted a student to work more on her summative presentation by asking, "How are you going to make it look like a news report? What will make it different from sitting at a table? What props will make it look like a talk show?" Positive reinforcement (and/or suggestions to expand the students' frame of references) often led into questions that prompted further exploration and learning/improvement. This attitude traversed into positive teacher discussions about students. According to the Principal, "They're not talking about what this kid's not doing. They're talking about what

the kid is doing." Students also avoided using the words "wrong" or "right" as a caring approach to learning, one of the desired IB attributes. A student said that they were taught to be caring leaders, "Are you going to say, oh, that's wrong? No. You have to be caring." The teachers encouraged student self-confidence through compliments, recognizing student expertise, and using open-ended questions and guiding suggestions.

Global Sensitivity Supported A Respect for Diversity

The caring attitude shared by IB participants translated into international empathy. One student said, "When we were talking about the tsunami disaster in Japan, I told my mom, why are they not caring about Japan anymore? I want to help Japan." Another student responded, "We should help countries, every place and everything, so we can have peace and quiet and not have wars on our planet. We should really help people and animals." Students' work displayed throughout the hallways and in the classrooms reflected cultural diversity. The art teacher introduced artists of Japan, Mexico, etc., while the classroom teachers offered research materials and possible summative ideas reflecting international events or history. From the observed units, Features of a region influence human settlement patterns, Humans have a responsibility for the equilibrium of the planet, and Humans predict, impact, and adapt to climate change students' summatives honed in on concepts of interest. Masdar City (an urban development near Abu Dubai in the Middle East with high quality of life and a low environmental footprint), the Elections in Egypt, and Animals Near Extinction not only revealed international problems, but a global consciousness and positive resolution ideas.

For some, learning about other cultures as an integrated part of the PYP curriculum also encouraged them to feel proud about their own cultural heritage, a natural enhancer of self-value. Many students connected personally with historical events involving cultures other than their own. One teacher mentioned,

> We study events in history, such as Civil Rights, and then read a story about a hate crime against Hispanics in the newspaper, and the students have a great compassion for the African Americans during the Civil Rights movement because they make a connection between the current and past story. . . . it's looking at the differences and similarities between all cultures and getting students to realize we are all human beings.

Visitors also observed a respect for diversity at the school. According to the Principal, 'We had Hispanic kids that came from … [a local high school] and they made the comment when they came in: "The differences are respected here. Everybody's just working together. You're respected, but you're not singled out because you're Spanish or anything else." ' Students valued cultural differences and considered their peers' opinions regardless of cultural background. Even when a newspaper photographer came to the school and wanted to document a group's presentation, a student member said he'd need to first consult others in his group. Students also admitted, "They [teachers] let us stand up and tell what we think."

Motivation for Learning

As important as self-esteem is to learning, motivation is necessary to promote a thirst for new knowledge. When students are emotionally involved "they are personally invested and the motivation for learning increases" (Erickson, 2007, p. 11). Offering Westwood fourth graders choices that were personally meaningful (intrinsic motivation), involving them in formative and summative assessment, exposing them to a variety of educational resources, and reinforcing knowledge with experiential activities that encouraged the use of students' areas of multiple intelligences (Gardner, 2006) made them feel valued and motivated. According to the Vice-Principal, "We've worked really hard on the intrinsic motivation for kids . . . . For a child to ever break the cycle of poverty, that there's going to

have to be that internal motivation." And the Principal stated, "Engaging students consistently, letting them make choices and keep them engaged, that within one generation, they can break the poverty cycle and think differently than their parents did and get better results."

Choice

There was evidence of choice in the art and regular classroom curricula. One of the classroom teachers stated, "Our IB learning is fun. . . . the kids get to ask questions and their inquiry drives the learning . . . . They have choice, and who isn't motivated by that?" A student said, "We get to choose a project. We choose a fun way to show our knowledge."

Classroom teachers involved students in developing and adjusting evaluative rubrics for summative presentations and choosing a topic from a general teacher suggested list or one of their own related to the curriculum concept. Teachers helped students find multiple research opportunities for learning about their topics (books, Internet sites, magazines, etc.) and allowed them to consider a variety of options for a creative summative presentation format at the completion of research inquiry. Many students revealed their enthusiasm. One said, "You get to pick your project and choose to be by yourself, with a partner, or in a group." Throughout their classroom learning experience, teachers encouraged students to seek a variety of methods or solutions to solving problems.

The art teacher connected with the school-wide curriculum concept, but gave options in art subject matter, style, and media. When studying weather, the class learned about a variety of international artists who portrayed weather in their art, from Louisa Chase to Katsushika Hokusai using a book by Carroll (1996). They critically examined how each artist approached landscape and discussed how particular media contributed to the visual atmosphere. Students chose to create a personal landscape and were given options to choose one of four types of media to best represent their weather (watercolor, pastel, tempera, or printmaking). They discussed advantages of the chosen media with the class through questions such as: What medium might offer the most detail in the landscape, or what medium could you use to blend colors to show storm clouds and tornadoes? One student changed his media choice after discovering that watercolor could not give him the detail he wanted and decided to switch to a relief print. Having choices in art is common, but pushing students to justify an appropriate media choice exceeded skill-based goals promoting higher levels of thinking and problem-solving. Their artwork also led to discussions about local weather reflected in the student work, where they displayed personal experiences with tornadoes and floods.

Creative Connections

The classroom or art room sometimes appeared chaotic to an outsider, but it was an environment of pervasive enthusiasm and creative experiential learning. Students discussed their research or plans for a summative working on the classroom floor, in the hallway, or grouped together at a table. Others rehearsed a new song they wrote about global warming. According to a student, "You don't [exclusively] do paperwork. You learn in a fun way. You do fun projects and get to learn more by doing activities." His peer said, "I was in another school that wasn't an IB. We always worked from a book. We never did projects. In this school, it's different. We learn in a fun way. We build stuff. We do summative and really neat stuff." Having fun using their hands and learning at the same time was a consistent response. One student said, "It's fun—That's why it's memorable."

Many 4th-graders reported that art was an important part of their IB curriculum and relating the art curriculum back to the central idea advanced their overall learning. While studying the central idea, Humans predict, impact, and adapt to climate change, students

had the opportunity to connect their personal experiences with tornadoes. Student art prompted discussions of current events in the art classroom and tornado safety. When students made their own weavings in art, the art teacher asked how weather could influence weaving. It could affect cotton crops or animals providing wool. Not only did students connect with the IB transdisciplinary curriculum concept and gain creative problem solving skills as mentioned earlier, they acquired art skills and contextual knowledge that could be applied to their summative.

Instead of relying exclusively on magazine cut-outs for their summative visuals, students felt confident building three dimensional structures out of a variety of materials, often recycled, and drawing or painting pertinent subject matter. Students mentioned that it was more exciting to create something and encouraged them to "grow independent." One student asserted that if he didn't have art, "That would be a disaster. We couldn't do projects and all of that." In art, "we learn more and are able to express our feelings."

Evidence of creative thinking and its applications learned in the art class expanded in the regular classroom. "I always use what I learn in art," said one student. "We don't just work, we do fun things with art," said another. Students responded that art also expanded their ideas and approaches to showing evidence of what they learned. The principals noticed what students learned in art was demonstrated in summative presentations. The Vice-Principal remembered how a special needs student applied his/her knowledge of balance in a visual model of the Gold Rush connecting with the central idea, Features of a region influence human settlement patterns. The art teacher noticed that students were not focused on what they could make, but how they could better express and communicate knowledge. In one classroom, students played a water cycle game with dice to randomly sequence ten places where a drop of water might go. With this information, students had the option of drawing a comic strip or writing a creative story about the travels of their water drop, and at the same time understanding the concept of the water cycle and how it is not always exactly the same sequenced process. All but one student chose to draw an elaborate comic strip and write a humorous script about their travels. Comments from students were, "It's a lot of fun," and "It's entertaining for the class and you learn." I also observed the fourth graders' presentations of maps illustrating their own imaginative planets and reasons why they would want to live or not live in certain areas (pushes and pulls). Students connected their own interests in creating names for their planets (soccer planet, candy planet, etc.) and better understood the concept of push and pull. I experienced the height of enthusiasm in the classroom when students tackled creating a public service announcement about global warming. Within one afternoon, students chose to work with peers they'd never collaborated with and managed to create some of the most impressive public service announcements (PSAs) with props, visuals, and script in a few hours.

One group reported with a Powerpoint on an Indian Ocean tsunami. They mentioned how scientists have claimed that global warming caused glaciers to melt in the polar regions, reducing pressure on the earth and caused volcanoes, earthquakes and tsunamis, and followed up with a quiz game for students. While they were rehearsing, a teaching aide came into the room thinking it was too chaotic, but misunderstood the students' enthusiasm for learning while rehearsing their PSAs. Students admitted that applying the arts to their learning "helps me understand." Another group wrote a song for a music video. According to a peer, "The song makes me remember, because I remember when we had to go down to the music room every morning to practice it to get it right." Students enjoyed making things, especially in their summative (e.g., puppet show, comic book, song, backdrop, drawing, painting, model, sculpture, etc.). One said, "it would be boring with just words on everything," and "some really don't explain with words. They teach more with

pictures." Students used clay for modeling how babies were transported from Vietnam through "Operation Baby-Lift." As part of the central idea, another group constructed houses and landscapes out of cardboard and paper to represent the affects of hurricane Katrina. "We want someone to be excited when they see it," Other concepts represented by creative visuals were the Haiti Earthquake, Gold Rush, Trail of Tears, Vietnam War, Crisis in Egypt, and Slavery. Many agreed that they enjoyed using the arts (drama, visual art, and music) to present knowledge learned, "You could have more fun, add more detail and color, and remember it."

I also recognized the enthusiasm students had for presenting their summative. Most students raised their hand to be the next group chosen to present. When I asked a student why everyone was so excited, she said, "You get to have fun learning, be creative, draw, color, use clay." Although teachers monitored when students had done enough research and planning prior to working on constructing a summative, Savannah anxiously asked if she could start on her summative earlier if she completed all of the research. Even while waiting in line to take school photos, students commented how they wanted to get back to work on their summative. Deciding on an interesting research topic, developing inquiry questions, and collecting information were most challenging for students, but enthusiasm unfolded when they worked on their summative whatever shape or form it took. The Principal affirmed, "When students see you in the hall, they try to pull you in to see they're summative. They're proud of it."

Conclusion

This qualitative study of three fourth grade classes at Westwood Elementary School provided supporting evidence of the efficacy of IB methods for disadvantaged students in a modified PYP. In addition to improvements in test scores, discipline and attendance at Westwood since implementation of the PYP, qualitative data gathered during this five-month participant observation revealed factors that might provide a better understanding of the environment, student learning, and how the visual arts contributed to this PYP. Westwood had a positive school environment. Students' work adorned hallways and classrooms. Abundant collaboration and support was evident among teachers across disciplines, among students, and between students and teachers. This cooperative environment paved the way for student self-confidence and motivation for learning. According to Lillemyr, Sobstad, Marder, and Flowerday (2011) and Martin and Dowson (2009), interpersonal relationships and social formats for education are important influences on students' self-concept, motivation, and achievement, as opposed to learning in isolation of the world's problems.

In the midst of a student-centered, cooperative learning environment, factors that seemed to support student self-confidence and motivation emerged. (1) Peer and teacher support encouraged students to be risk-takers. As Community Contributors, students used their areas of expertise in collaborations with each other and in assisting their peers to be confident risk-takers. As Quality Producers, students took pride in their work with an understanding of the time and energy put forth to reach a level of excellence. (2) Education practices went beyond verbal and mathematical to include some of Gardner's (2006) multiple intelligences where teachers and students recognized and appreciated everyone's expertise. (3) Teachers focused on positive formative assessment with the use of questions-as-suggestions to improve student work. (4) Every curriculum concept incorporated universal global connections (climate change, migration, etc.) that made students feel inclusive and personally connected to issues throughout the world regardless of their culture or ethnicity.

With a necessary foundation of student self-confidence, motivation for learning emerged through (1) Opportunities for student choice and decision-making and (2) collaborative, inquiry-based, transdisciplinary, project-based learning. Teachers encouraged students to analyze facts, think critically, formulate questions, and collectively make decisions based on thorough research. Students played an important role in creating assessment rubrics with their classroom teacher, making adjustments near the beginning of each unit of study. Collaborative transdisciplinary learning challenged students to work together using multidisciplinary resources when learning information about a topic of chosen interest and transforming that knowledge into a creative format that made use of the expertise of group members. Many students chose to use their skills and interests in visual and performing arts to show what they learned. According to Stevenson and Deasy (2005), learning through the arts is particularly beneficial for low-income disadvantaged students. The arts "build understanding among diverse groups of students as well as a sense of school community" (p. 4). Regardless of demographics, transdiciplinary learning through the arts challenged and motivated students to think and make decisions in collaboration with others, using and valuing the expertise of peers. Overall, Westwood's approach to the IB PYP seemed to be successful in promoting student self-confidence and motivation for learning, regardless of student ethnicity or socioeconomic status. Learners felt empowered and enthusiastic about attending school and learning through project-based opportunities.

A 21st century education should apply some of Westwood's approaches to building student self-confidence and motivation for learning. Regardless of whether schools follow IB curriculum, many of the strategies found at Westwood are historically represented in constructivist education literature and research. At the heart of the school's educational practice are the teachers' and administrators' value and application of arts integration. According to Young (2009), "By studying and participating in diverse arts activities, students will gain a much-needed global literacy. Such integration is particularly beneficial to student learning in literature, history and language. . . . arts programming consistently correlates with increased academic success among underserved students" (p. 12-13). Many schools serving lower income students need quality arts programs and arts integration to increase self-confidence and motivation for acquiring new knowledge, a foundation for lifelong learning and academic achievement.

Limitations and Implications

The limitations in this study are based on the collection and interpretation of qualitative data collected by the researcher from the specific site. Since IB PYP programs vary, regardless of their basic principles for learning, occurrences at Westwood are unique to the school, its administrators, teachers, and students. Findings cannot be generalized. Yet, some aspects of this type of creative inquiry-based, student-centered, project-based learning can benefit culturally and socioeconomically diverse students. Such outcomes might include positive influences on standardized test scores of socioeconomically disadvantaged students (Frank 2009; Hemelt, 2014). Yet, there is still a void in the literature regarding the learning advantages found in IB PYPs for this population. Future qualitative studies are necessary to better understand the complexity of the PYP at the growing number of schools around the world, not just to improve test scores, but to best prepare all students for a world in need of creative global thinkers.

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Endnotes

[1] The term "disadvantaged" refers to the large number of students at the elementary school on a free and reduced lunch program (FRLP), 83%, and their Limited English Proficiency (LEP), 58%.

[2] A participant observation is a multi-method, multi-person, multi-situation, multi-variable investigation of everyday reality including three stages: data collection, content analysis, and comparative analysis (Pohland, 1972).

[3] Content analysis involves "the process of identifying, coding, and categorizing the primary patterns in the data. . . . analyzing the content of interviews and observations" (Patton, 1990, p. 381) while themes emerged from the data. I used comparative analysis to parse out "the interrelation of these conceptual themes" (Stokrocki, 1986, p. 83).

[4] Transdisciplinary refers to any concept "that which is at once between the disciplines, across the disciplines, and beyond all disciplines" (Nicolescu, 2002, p. 44), as an approach to education that promotes a meaningful understanding of our current world.

[5] Content analysis involves "the process of identifying, coding, and categorizing the primary patterns in the data. . . . analyzing the content of interviews and observations" (Patton, 1990, p. 381) while themes emerged from the data. I used comparative analysis to parse out "the interrelation of these conceptual themes" (Stokrocki, 1986, p. 83).

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Short Vowels Versus Word Familiarity in the Reading Comprehension of Arab Readers: A Revisited Issue

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Abstract

Arab readers, both beginning and advanced, are encouraged to read and accustomed to unvowelized and undiacriticized texts. Previous literature claimed that the presence of short vowels in the text would facilitate the reading comprehension of both beginning and advanced Arab readers. However, with a claimed strict controlling procedure, different results emerged, revealing that the only variable that affected the reading process of Arab adult skilled readers was word frequency, and its effect was limited to the time load of the reading process; this result raised the question of whether the neutral role of short vowels in the text reading process of experienced Arab readers would be maintained for less experienced readers, as represented by fourth graders, or whether word frequency would be the only variable that plays a role in their reading process. In experiment, 1,141 fourth-grade students were randomly assigned to 5 reading conditions: plain, only shaddah, short vowels plus shaddah, only short vowels, and finally the wrong short vowels plus shaddah. In experiment 2, 38 participants from the same population were assigned to a fully vowelized and diacriticized reading condition. Each participant was asked to read two texts, of high and low frequency words and then given recall and multiple-choice tests. In general, the multivariate analysis showed that the only manipulated variable that was found to affect their reading process in terms of reading time load and, to some degree, reading comprehension was word frequency, although its effect was marginal. Accordingly, pedagogical recommendations and future research were proposed.

Keywords: Arabic short vowels, Arabic beginning readers, Reading comprehension, Arabic orthography.

Introduction

Reading comprehension, both process and product, is affected by many factors that are related to the text, the reader, and the interaction between the text and the reader (Kendeou, Muis, & Fulton, 2010). Indeed, those factors can also be classified as either internal or external factors. Internal factors are considered to be factors that are related to the text per se, and thus they are considered to be textual, such as the words embedded in

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the text in terms of frequency and abstractness (e.g., Ryder & Hughes, 1985), syntactic structures, genre (e.g., Meyer & Freedle, 1984), and text organizing structure (e.g., Meyer, 1975). External factors, on the other hand, are considered to be exterior factors that are related to the reader, such as his/her prior knowledge of the topic (Bransford & Johnson, 1972; Kendeou, Rapp, & van den Broek, 2004, 2007; Kientch, 1988), reading skills, schemata and beliefs (Kardash & Howell, 2000; Kendeou et al., 2010), interest, and knowledge of and skills in using cognitive and metacognitive strategies (e.g., Zwaan & Brown, 1996).

One internal factor that is exclusive to texts written in Arabic is its orthography, which permits a dual representation of its scripts: a shallow, transparent orthography, in which the appropriate short vowels (*dhammah* ـُ, *fatha* ـَ, and *kasrah* ـِ) and diacritics (*shaddah* ـّ and *skun* ـْ) are supplement with the consonants in the text, and a deep orthography, in which only the consonants are presented and no appropriate short vowels or diacritics are provided (Abu-Raiba, 1995; Mahmoud, 1980; Seraye, 2004).

Arabic is a Semitic language written from right to left with an alphabetic-principle-based writing system that represents both consonants and short vowels, including the diacritics, separately and voluntarily. The Arabic writing system visually consists of two types of symbols: consonants that represent, to a large extent, the *trilateral/quadrilateral* root of words, and tiny visual signs that are affixed to the consonants and take the shapes of diacritics. However, by analyzing the script symbols in terms of functions, we could divide the Arabic writing system symbols into four types. (1) There are 26 consonants, including the three long vowels that represent both a consonant and a vowel under some conditions: "alif: ا," "waaw: و," and "yaa': ي." (2) There are three short vowels, "*fathah,"* "*dhammah,"* and "*kasrah*," that mark the equivalent short vowels in English, *a*, *u*, *i,* and take the forms of diacritics, and the following shapes: 'ـَ,' 'ـُ,' and 'ـِ' respectively. (3) Diacritics are very small visual signs that are superscripted to the consonants or the letters in a word: *skun* is represented with the symbol 'ـْ' to indicate that the consonant is vowelless; *shaddah* is represented by 'ـّ' and is used to indicate a doubled consonant "geminated," and *maddah* is represented with the symbol 'ـٓ' and is placed over the consonant 'ا' to indicate the combination of two consonants, *alif* 'ا' and *hamza* 'ء.' Finally, (4) the case-ending markings are very small visual symbols that take the following shapes "ـْ", "ـُ", "ـَ", "ـِ", to indicate syntactically different cases, including the nominative, genitive, and accusative cases. The short vowels might be doubled to indicate nunation, which takes the following shapes: ـً, ـٌ, and ـٍ (Bateson, 1967; Campbell, 1997; Mahmoud, 1979).

The voluntariness of representing short vowels and diacritics in Arabic print that characterizes Arabic orthography has resulted in a dual representation of its print: a transparent orthography in which the appropriate diacritics are supplemented with the consonants, as can be seen in traditional and young children's texts; and a deep orthography in which only the consonants and no appropriate diacritics are presented, as can be seen in public print, newspapers, and books written for adults.

This uniqueness of Arabic orthography of being of dual representation has attracted some researchers to evaluate its effect on the process of reading Arabic at all textual levels—word recognition, sentence understanding (specifically parsing), and text integration—using different populations and different types of materials and methodologies (see for example Abu-Rabia, 1995-2001; Ibrahim, 2013; Ibrahim, Eviatar, & Aharon Peretz, 2002; Seraye, 2004). Subsequently, researchers also examined word recognition, sentence parsing, and text reading and comprehension to assess the extent to which the departure of a writing system from representing speech, as can be realized in the absence of short vowels/pointings and diacritics from script, might influence the reading process (Chitiri, 1991; Seraye, 2004; Shimron, 1993). Such investigations would

help researchers in the field of reading to arrive at a universal explanation of the "blueprint of the reader" (Perfetti, 1999) through integrating other alphabetical writing systems and unique orthographies in the equation, constructing a reading model of the Arabic reading process. Finally, they would also help Arabic curriculum designers and policy makers to suggest appropriate reading instruction methods and reading scripts for school pupils.

One of the major concerns over the role of those missing tiny short vowels and diacritics from Arab students' print/textbooks was its effect on students' reading comprehension, a concern that drew the attention of some Arab researchers to investigate to what extent the absence of short vowels (and diacritics) from Arab reading materials would affect students' reading process while they attempt to integrate the text in order to understand it. Abu-Rabia (1999) conducted two experiments to compare the effect of short vowels on the reading comprehension of two different populations: second graders (given the label "the beginning readers") and sixth graders (given the label "the advanced readers"). In Experiment 1, 74 sixth graders, aged 12 to 12 ½, were divided randomly into two groups: in one group, the participants individually and silently read a vowelized short story taken from their "basic reader," and answered 10 multiple-choice vowelized questions. In the other group, the participants individually and silently read the unvowelized version of the same text and answered 10 multiple-choice unvowelized questions. In a within-subject design, the researcher conducted the same procedure by asking 71 second graders, aged 7 to 8, to read two different narrative texts, one vowelized and the other unvowelized, and then answer seven multiple-choice vowelized questions, in two sessions with two days elapsing between them. The results showed that both the beginning readers and the advanced ones benefited from the presence of short vowels in the texts, which facilitated their reading comprehension, as can be realized from the significant difference between the means. The second graders on average scored higher with vowelized texts (M= 6.34, SD= 1.58) than with unvowelized ones (M= 5.46, SD= 2.00) with a maximum score of 7 for both tests, and the sixth graders on average scored higher with the vowelized text (M= 7.20, SD= 1.70) compared with the unvowelized one (M= 6.10, SD= 2.22) with a maximum score of 10 for both tests.

According to Abu-Rabia (1999), this result can be explained in terms of the role of short vowels in providing the text with phonological information that "affects working memory in processing text information in such a way that, if information is also phonologically coded in working memory, this will maintain that information longer during reading, which facilitates reading comprehension" (p. 100).

In another study (Abu-Rabia, 2001), three tasks were designed to investigate the role of short vowels, pointings (the counterpart of short vowels in Hebrew orthography), and context on the reading process of Arab adults as they read Arabic and Hebrew reading materials: words, short paragraphs, and short story texts. In one task, 65 native Arab adults, who were university students aged 22 to 30 years and were proficient in Arabic and Hebrew, were assessed on their reading comprehension in relation to the presence and absence of both short vowels and pointings as they read short story texts written in Arabic and Hebrew.

There were two different short stories: one written in Arabic and another written in Hebrew. From each story, two versions were constructed to present the reading condition: one was presented fully vowelized for the case of Arabic, or fully pointed for the case of Hebrew, and the other was presented fully unvowelized or unpointed, respectively. Although it is not clearly stated, it seems that the participants were divided into two groups, and each group received one reading condition. One group individually and silently read the vowelized Arabic text and the pointed Hebrew text, and the other group

individually and silently read the unvowelized Arabic text and the unpointed Hebrew one, then they answered six multiple-choice questions (with 6 as the ultimate score).

The results demonstrated that the participants on average performed better with the fully vowelized and pointed texts than with the ones presented without short vowels or pointings (*M*= 4.51, *SD*= 1.20 for the vowelized Arabic text, and *M*= 4.10, *SD*= 1.56 for the unvowelized Arabic text; *M*= 2.43, *SD*= 1.39 for the vowelized/pointed Hebrew text, and *M*= 2.27, *SD*= 1.16 for the unvowelized/unpointed Hebrew text). Abu-Raiba (2001) attributed these results to the presence of short vowels and pointings in the texts, which provided "additional phonological information" (p. 52) and subsequently helped in understanding the text.

This finding of a positive effect of short vowels on the reading comprehension of Arab adults does not just support Abu-Rabia's (1999) previous study in showing a consistent result, but also empowers the role of short vowels in facilitating the reading comprehension process of Arabic readers regardless of their reading skill. Not just beginning readers but also experienced ones (adults) benefitted from the presence of short vowels in the texts they read. However, examining the mean values for both studies shows that the less experienced readers, second graders, benefitted much more from the presence of short vowels in the texts; they reached comparatively higher maximum scores than the experienced skilled readers, sixth graders and adults.

In the case of Hebrew texts, the positive effect of short vowels (pointings) on the reading comprehension of adults as they read a Hebrew text was in agreement with a previous study by Shimron and Sivan (1994), which showed that providing a Hebrew text with short vowels/pointings helped the adults comprehend the text to some degree better than they comprehended an unvowelized/unpointed text (*M*= 1.75, *SD*= 0.44 for correct answers for the vowelized text; *M*= 1.42, *SD*= 0.72 for the unvowelized text). However, reading comprehension, as can be assessed by the load reflected in the reading time it took the participants to read the texts, showed that on average it took the participants the same amount of time to read the vowelized/pointed and unvowelized/unpointed Hebrew texts (*M*= 68.8 s, *SD*= 31.3 s for the unvowelized text; *M*= 69.0 s, *SD*= 30.4 s for the unvowelized text).

It can be concluded from Abu-Rabia's (1999, 2001) studies that short vowels (I use his term roughly here, because presenting the text fully vowelized does not mean providing the text with only short vowels but means providing it with other diacritics that also represent speech: *shaddah*, *skun*, and case markings) had an effect on the reading comprehension of Arab readers as they read a text silently for comprehension, and that was consistent regardless of the type of population involved in the process: beginning readers with less experience or advanced ones with more experience. Further, the effect was noticed on the product of the reading comprehension process as was assessed by the multiple-choice test. Other variables for assessing the reading comprehension process, as can be realized by the reading time it takes the subjects to read a text, were not incorporated in the two studies, although they reflect the reading comprehension process.

Thus, more than one drawback can be observed in Abu-Rabia's (1999, 2001) studies. These drawbacks are related to the methodology applied, including the dissimilarity and type of texts used (e.g., the length of his experimental texts were equalized on the number of words, and not on the number of morphemes where they should due to the affixation feature of Arabic; nor they were equalized in terms of word frequency, syntactic structure, or genre) and their familiarity to the participants, especially in the 1999 study. The author also failed to manipulate the short vowels to the degree that their effect alone would be isolated, because the author included *shaddah* and *skun* as short vowels in Arabic. Further,

he included even the case endings, tiny signs take the shape of short vowels and the diacritic *skun*, which function in relation to the syntactic structure of the sentence. The measurement applied was insensitive (only a multiple-choice test was used, not a recall test), and finally the difference in the results was overestimated and the author did not point out to the slight difference between the means. In the 1999 study, the means were 7.20 out of 10 for the vowelized condition and 6.10 out of 10 for the unvowelized condition, a difference of 1.10, and 6.34 out of 7 for the vowelized condition and 5.46 out of 7 for the unvowelized condition, a 0.88 difference. It should be noted that the measurement scale involved one point for each correct answer, and therefore a 1.10-unit difference and a 0.88-unit difference between the means were equivalent to differences of 1.10 and 0.88 correct answers, respectively. Thus, the effects of short vowels on the reading comprehension of both advanced and beginning readers should have taken into account the sizeable difference between the means and the measurement scales employed in the study.

For the 2001 study, it was found that the participants performed better with the vowelized texts and with the pointed texts than with the texts that were presented plain—that is, without short vowels or pointings. However, examining the means between each pair of reading conditions shows the same phenomenon found in the 1999 study; only a very slight difference between the means was found. For the Arabic texts, the participants scored 4.51 on average for the vowelized Arabic text and 4.10 for the unvowelized Arabic text, a difference of 0.41; for the Hebrew texts, the participants on average scored 2.43 for the pointed Hebrew text and 2.27 for the unpointed text, a difference of 0.16, which equals a 0.16 difference in correct answers. Because the measurement scale involved one point for each correct answer, the 0.41-unit difference and the 0.16-unit difference between the means were equivalent to differences of 0.41 and 0.16 correct answers, respectively. Thus, interpreting the effects found for the short vowels and pointings on the reading comprehension of Arab adults should have taken into account the sizeable difference between the means and the measurement scales employed in the study.

Accordingly, attributing this difference in comprehension performance to the short vowels per se is still questionable under these conditions, as Abu-Rabia's studies did not control for the short vowels to the degree that would isolate their effect accurately, nor did they control for the texts used in terms of being identical, as he used two uncontrolled-for texts. Furthermore, he included other diacritics, such as the *shaddah* sign, ّ, as short vowel signs, which means that "the representation of the short vowels was not scientifically and experimentally manipulated to the degree that the extraneous variables were controlled" (Seraye, 2004, 56). Therefore, it was necessary to take such realities into account to reassess the role of short vowels in the reading comprehension of adult Arabs who were exposed only to unvowelized texts and to determine the degree to which such exposure would affect their reading process as they read vowelized texts versus unvowelized texts.

In Experiment 1 of a three-experiment study, Seraye (2004) study responded to such concern and assumed that, once we control for the reading materials used, the procedure, and the reading condition, the homographic phenomenon that characterizes the unvowelized Arabic text would not affect people's reading comprehension, nor would the presence of short vowels. He reasoned that Arab adults (considered to be experienced readers) would use their language experience, particularly the morphological stem of the Arabic root of the words, their trilateral/quadrilateral root, and the linguistic textual context, in understanding the text. Thus, Seraye (2004) used a matching procedure to construct matched texts on all textual levels. In terms of short vowels, he differentiated between full consonant representation and full "morphological short vowel" representation in order to exclude confounding effects of other diacritics (e.g., *shaddah*,

case-ending markings, and *skun*) and thus to determine the role of short vowels in comprehension. Further, he built a frequency effect into the design because word frequency could covariate with the vowelization effect. He also used a retelling procedure (recall), which is considered a better indicator of readers' performance on texts, in addition to a multiple-choice test (Lipson & Wixson, 1997).

For the purpose of the study, two texts were constructed, one high-frequency text (HF) and one low-frequency text (LF), by using a matching procedure to guarantee the identicality between the texts, except in word frequency. The two texts, one HF and one LF, were of 504 words and 834 morphemes each and served as the main texts in the experiment. Five versions of each text were constructed to represent the reading conditions: in the first condition the text was given plain (no short vowels or *shaddah*), in the second condition the text was provided with only *shaddah*, in the third condition the text was provided with short vowels plus *shaddah*, in the fourth condition the text was provided with short vowels minus *shaddah*, and finally in the fifth condition the text was provided with wrong short vowels plus *shaddah*. The author included the only-*shaddah* and only-vowels conditions in his design for control purposes. The participants were 104 native Arabic speakers aged 19 to 40. They were randomly divided into five groups and then assigned randomly to the five reading conditions. Thus, in each reading condition, the participant silently read two texts, HF and LF, in two sessions separated by 14–20 days. The order of passage presentation was rotated to counterbalance reading materials and reading conditions within each group. The first group read the plain texts (no short vowels or *shaddah* were provided); the second group read the texts with only *shaddah* (only *shaddah* was provided with the text); the third group read the texts vowelized with *shaddah* (both short vowels and *shaddah* were provided); the fourth group read the vowelized texts (only short vowels were provided), and the fifth group read the texts wrongly vowelized with *shaddah* (both short vowels and *shaddah* were provided on the wrong positions in the words, which would lead, if they were read with the consonants, to phonemic distortion and not to graphemic distortion). After each reading, the participant was asked to recall what he read and then respond to 10 multiple-choice questions. There are three dependent variables collected: the reading time it took the participant to complete the text, measured in milliseconds; the propositions recalled after the reading task and the correct answers on the multiple-choice test; and two independent variables, the vowelization conditions and the text types, HF versus LF.

The results showed that for the reading time data, a significant main effect was found for text type (HF vs. LF), but not for reading condition. Further, there was no significant interaction between text type and reading condition. As a result, it did not matter which reading condition the participant was in; it always took him longer to read the low-frequency text than the high-frequency text. On average, it took the participant 206.32 s to read the LF text and 194.13 s to read the HF text.

For the number of propositions from the recall test data, no significant main effects for text type or reading condition were found. Further, the results did not show any significant interaction between text and reading condition. Thus, it did not matter which text the participants read or which reading condition they were in; their performance was on average the same. There was a 1.5-unit difference in recall between the marginal means for the LF and HF texts (30.83 and 29.31, respectively), with the note that the measurement scale involved one point for each meaningful proposition, and therefore a 1.5-unit difference was equivalent to a difference of 1.5 propositions.

For the number of correct responses as measured by the multiple-choice test, the analysis revealed exactly the same result that was obtained from analyzing the data of the recall test. That is, no significant main effects for reading condition or text type were

found, nor was there a reading condition × text type interaction. Thus, it did not matter which reading condition the participants were in or which text they read; their performance was on average the same. In fact, the difference between the marginal means for reading condition and the difference between the marginal means for text was a fractional difference (only a 0.1 difference between the HF text marginal mean and the LF text marginal mean: 7.62 and 7.52, respectively). Note that the measurement scale involved one point for each correct response, with an ultimate score of 10 points.

In general, the results showed that the presence or absence of short vowels and diacritics in combination does not affect the reading process comprehension of skilled adult Arabic readers. In sum, the results demonstrated that the only variable that affects the reading process of skilled adult Arabic readers is word frequency.

Those findings of Seraye (2004) did not contribute positively to the subsequent investigations conducted by Abu-Rabia and others. For example, in a descriptive comparison study of dyslexics of Grade 8 (*n*= 29) and matching normal readers on both reading performance (*n*= 29 of Grade 6) and chronological age who had similar general ability performance (*n*= 31 of Grade 8), Abu-Rabia and Abu-Rahmoun (2012) compared the performance of the three groups on multiple tasks—phonological, orthographic, spelling, and reading comprehension tasks—under two reading conditions: vowelized and unvowelized. On the reading comprehension task, the participants were asked to read two different informational texts (only controlled and equalized on the number of lines), one fully vowelized and the other presented plain, which were chosen from their basal reader for Grade 8. The analysis revealed that all groups' participants benefitted from the presence of short vowels; that is, the participants performed better with the vowelized text (*M*= 6.44 vs. 5.33 for dyslexics, 7.66 vs. 4.83 for normal readers of matching reading level, and 9.48 vs. 8.32 for normal readers of matching chronological age, for the vowelized and unvowelized texts, respectively). Furthermore, the two normal groups comprehended the vowelized text much better than the dyslexic group. However, the size difference between the means, particularly for the dyslexics and the group of normal readers matching the dyslexics on age variable, was still a small difference, 1.11 and 1.16 units.

In line with Abu-Rabia's perspectives on the role of short vowels, Abu-Hamour et al. (2013) administered two tasks adopted from the curriculum-based management assessment in order to ensure its applicability in evaluating the reading performance of Arabic fifth graders. There were 131 fifth graders (divided into two groups: 89 of skilled reading ability, and 42 with struggling reading ability) and two tasks: oral reading fluency and silent reading comprehension. In the second task, which was designed to assess the reading comprehension of fifth graders in relation to the presence and absence of short vowels, the participants were given a text of 300 words with reading conditions (plain, partially vowelized, and fully vowelized) with every seventh word deleted and were asked to silently read the passage within three minutes and "restore" the right words from the three alternatives provided after every deleted word. Thus, the number of correctly restored words was the dependent variable in the study (42 were the maximum score). Thus, every participant was asked to read three texts under the three reading conditions and restore the deleted words from the three alternative options. Although the skilled readers scored higher than the struggling readers, both skilled and struggling readers performed better with the vowelized texts (*M*= 24.19, *SD*= 5.64 for skilled readers on the vowelized text and *M*= 7.88, *SD*= 3.82 for the plain text; *M*= 14.19, *SD*= 5.51, *M*= 3.76, *SD*= 2.80 for struggling readers on the vowelized and plain texts, respectively. Their justification for these results is that, unlike the situation with the plain text, vowelizing the text makes it transparent and reserves the attention needed for comprehension.

From the overall results, two factors were found to play a role in the Arabic reading process for reading time and reading comprehension: short vowels, as Abu-Rabia (1999; 2001), Abu-Rabia and Abu-Rahmoun (2012), and Abu-Hamour et al. (2013) observed; and word frequency, as observed by Seraye (2004). Therefore, the question is whether the effect of short vowels on reading comprehension, as found by Abu-Rabia (1999) and Abu-Hamour et al. (2013), holds with the correct categorization of less experienced readers, as represented by fourth graders—who are starting to read across the curriculum and for learning, and whose textbooks are written in a deep orthography, versus with second graders, who are still learning to read, or fifth graders, who were more advanced readers, when the appropriate experimental control is taken. Alternatively, should we find word frequency, as found in Seraye's (2004) study on Arab adults, to be the only variable that affects both populations' reading processes, with the more experienced readers represented by Arab adults (Seraye, 2004) and the less experienced readers represented by fourth graders in the current study? Therefore, a combination effect of both short vowels and word frequency on the reading comprehension process of fourth graders as they read connected texts is investigated. Such an investigation should accomplish the following aims: it should illustrate the role of short vowels, diacritics, and word frequency in the reading comprehension process of the less experienced readers, as represented by fourth graders, and subsequently tap into the results on how beginning readers' print and textbooks should be presented. Second, the results should help in building a model of the reading process in Arabic orthography by determining the factors that affect the process. Therefore, the goal of the current study is to assess the effect of short vowels per se, the word frequency per se, and the short vowels and word frequency in combination on the reading process of fourth graders' reading time and reading comprehension, as they read a connected text.

Therefore, two main questions were raised to represent the two main independent variables found to affect the reading process of Arabic texts: short vowels and word frequency. Since reading comprehension can be assessed as a process (reading time) and a product (correct responses), two sub-questions under each main question were constructed to assess the effect of short vowels and word frequency on the reading comprehension of skilled children Arab readers, as represented by fourth-grade students.

According to the previous observations, presenting the short vowels or the short vowels and diacritics in combination within an expository text should not affect the reading comprehension of fourth graders, as can be measured by the number of propositions they recall or the correct answers they score. The assumption is justified by the fact that skilled readers will use their linguistic knowledge, their knowledge of the *trilateral*/*quadrilateral* root that characterizes Arabic morphology, and the text context to compensate for the missing short vowels and diacritics from print (Abu-Rabia, 2002; Seraye, 2004; Abu-Rabia & Abu-Rahmoun, 2012). However, their reading process, in terms of the time they need to read the text, will be affected by the presence and absence of short vowels and diacritics: fourth graders should take more time to read a plain text than a vowelized one due to the heterophonic homographic phenomenon in Arabic words that, when starting a sentence, might garden-path the reader to the degree that it would force him/her to reread the sentence in order to choose the right word form (for more detail, see Experiment 2 in Seraye, 2004).

Further, it is assumed that word frequency might affect their reading time, but not their reading comprehension. Inserting 15–25% of the low-frequency words in the text should not affect their reading comprehension (Ryder & Hughes, 1985; Seraye, 2004), because the fourth graders would exploit their knowledge of the morphological roots of Arabic words, trilateral/quadrilateral roots, and the text context in constructing a textual

representation of the text they read. However, along with reading time, word frequency was found to affect Arab adult readers—the experienced readers (Seraye, 2004); subsequently, it is also expected to affect the less experienced readers, the fourth graders.

1) Do short vowels play a psychological role in the reading comprehension process of skilled Arab children as represented by fourth graders?

    1a) Is there a significant difference in the reading comprehension process, as measured by the reading time, of skilled fourth graders when reading a vowelized versus an unvowelized text?

    1b) Is there a significant difference in the reading comprehension product, as measured by the multiple-choice and recall tests, of skilled fourth graders when reading a vowelized versus an unvowelized text?

2) Does word frequency play a psychological role in the reading comprehension process of skilled Arab children, as represented by fourth graders?

    2a) Is there a significant difference in the reading comprehension process, as measured by reading time, of skilled fourth graders when reading a high-frequency versus a low-frequency text?

    2b) Is there a significant difference in the reading comprehension product, as measured by the multiple-choice and recall tests, of skilled Arab children when reading a high-frequency versus a low-frequency text?

Method

Experiment 1

Participants. One hundred and forty fourth-grade native Arab male students were chosen from three elementary public schools in Riyadh, Saudi Arabia. Their ages ranged between 9 and 10. They were offered R20 as compensation for their participation. All of them had normal vision and reported no learning or reading difficulties. The students' reading assessment scores from the first term were initially used to select suitable participants for the study, and other criteria—pre- and posttest procedures—were used to screen the participants, in terms of their reading proficiency level. Only those who had 40 or more correct readings from the 50-word list were included in the study. Further, a post-criteria judgment (reading a short passage) was administered in the second session for each participant to ensure that only those who expressed reading fluency were included in the experiment. Initially, 147 students were selected and then randomly divided into five groups, and then randomly into five reading conditions. Consent and admission were officially taken before administering the experiments. Out of the 147 participants who took part in the study, 6 participants were excluded from the study data due to either the post-criteria procedure, which revealed that they were under grade level in reading, or to their moving from the schools during the experiment

Materials. The use of controlled texts instead of familiar and different texts was necessary to address the questionable controlling issues observed in previous studies; thus, two long expository Arabic texts were constructed for experiment 1: one of high frequency (HF) and the other of low frequency (LF). To ensure equality between the two texts, a high-frequency text was constructed, and its low-frequency counterpart was created using a matching process. Other than the word frequency, the two texts were equalized on all aspects, including sentence structure, length, neighboring word size, and even on the number of words and morphemes, due to the affixation feature of the Arabic morphological system. In terms of the test's organizing structure, the events spots, pronoun names, and identities of the characters were replaced with other event spots,

pronoun names, and identities (see Seraye (2004) for more details on the matching technique). Thus, there were two texts of high and low frequency, respectively (each text contained 166 words and 320 morphemes). Sixteen words from the HF text (10% of the words in the text) were replaced with their low-frequency synonyms. Five versions of each text were created to control the short vowels and diacritics, as well as isolate the effects of the short vowels per se: one version was left plain—that is, unvowelized; the second was fully consonantally presented by providing the text with only the diacritic *shaddah,* ّ); in the third version, the text was presented with both short vowels and *shaddah*; with the fourth version, the text was supplemented with short vowels only and without any diacritics; finally, for a controlling procedure, the text in the fifth version was provided with the wrong short vowels and *shaddah* so that, if ignored and not assembled with the consonants, the text would resemble the plain text that the Arab readers were exposed to (see Table 1).

Table 1. *Reading conditions*

	Reading condition	Arabic Script
1	Plain	عبدالعزيز يعيش هو وعائلته في قرية من ... السعودية
2	Fully consonantly: with shaddah only	عبدالعزيز يعيش هو وعائلته في قرية من ... السّعوديّة
3	short vowels with shaddah	عَبدالعَزِيز يَعِيش هُو وَعَائِلَته فِي قَريَة مِن ... السَّعُودِيَّة
4	Only short vowels	عَبدالعَزِيز يَعِيش هُو وَعَائِلَته فِي قَريَة مِن ... السَعُودِيَة
5	wrongly vowelized and shaddah	عُبدالعَزِيز يُعَيشّ هِوُ وَعِائُلَتهّ فُي قُريِة مَن ... السِعَّوَدِيَّة

Further, a short passage of 100 words, written in both shallow and deep orthography, and a fifty-word list were constructed to assess the participants' reading proficiency level for the inclusion and exclusion criteria. The texts and word list were assessed and judged by experts in the Arabic teaching field, and by primary-grade reading teachers.

Measures. Three types of data were collected: the reading time in which the participant read the text, in milliseconds; and reading comprehension, as assessed by the recalling test based on the number of propositions recalled and by the correct answers based on the 10-item multiple-choice test. Both tests were judged by experts in the Arabic teaching field, and by primary grade reading teachers for their content validity, format, accuracy, etc. Both tests were piloted before the actual experiment. The recall test's reliability was examined using rater judgment, and the correlation coefficient was found to be $r = 0.97$. For the multiple-choice test, the alpha value was 0.67 for the HF test and 0.65 for the LF test. Further, a congruent validity was adopted, and the Pearson correlation coefficients between the recall and the multiple-choice tests were found to be significant ($r = 0.70$ for the HF test and $r = 0.69$ for the LF test).

Design. A split-plot factorial mixed 5 x 2 design was adopted for the current study (Kirk, 1982), with one between-subject factor (the five reading conditions) and one within-subject factor (the text type: HF vs. LF), in order to determine the role of each independent factor per se and in combination on the fourth graders' reading comprehension as they read a connected text. Counterbalance procedures were conducted between texts within every group in order to avoid the order effect.

Procedure. As explained before, previous studies do not to control for the carry-over effect from having the two texts read simultaneously, or from having a short time elapse

between the reading sessions. In one of Abu-Rabia (1999) experiments, for example, the task was given in two sessions with two days elapsing between them. Carry-over effect is possible in such a situation. Therefore, in order for the current study to have a controlled procedure, the carry-over and order effects were taken into account through counterbalancing and 14-20-day time interval between the experimental sessions (Seraye, 2004). Thus, in experiment 1, the participants were asked to read the two texts (the HF and LF texts) in two separate sessions, at intervals between 14 to 20 days. The tests were given in an empty, quiet room in the participants' schools. In session one, the participant was asked to read one of the texts for reading comprehension (either HF or LF) silently and at his pace; he was asked to read the other text in the second session. Directly following each reading, the participant was asked to recall the text he just read (prompts were used to prevent the participant from being selective in his recalling). The time it took each participant to complete the reading was calculated in milliseconds, and his recall was recorded. After the recalling task, the participant was given the multiple-choice test and instructed to avoid any guessing responses as well as to answer the questions according to what he read. The same procedure was followed for the second session, except that the participant was given a short passage at the end of the session to read orally and accurately, in order to double check the participant's reading skill, which would then be included or excluded from the data analysis. However, an additional procedure was taken for the group that was asked to read the wrongly vowelized and *shaddah* text. These participants were informed about the wrong short vowels and *shaddah* prior to reading. The order of text presentation was rotated within every group to counterbalance the texts and reading conditions. Both experiments were conducted and administered by the researcher.

Results. In order to answer the two questions and sub-questions proposed (a and b), three dependent variables were collected: reading time, as measured in milliseconds; the number of propositions, as assessed by the recall test; and finally, the number of correct answers, as assessed by the multiple-choice test. A multivariate analysis (a two-way repeated-measures analysis of variance) was adopted to determine whether there was a main effect for the short vowels per se, a main effect for the word frequency per se, or an interaction between the two independent variables, short vowels and word frequency, on the reading comprehension of the fourth graders.

Reading Time

For questions 1a and 2a on the reading time data ("Is there a significant difference in the reading process, as measured by reading time, among fourth graders when reading a vowelized versus an unvowelized text, and when reading a high-frequency versus low-frequency text?"), the analysis on the reading time data revealed a significant main effect for text type only (HF vs. LF), $F(1, 135) = 5.59$, $p = .019$, $\eta p^2 = 0.04$, and not for reading condition $F(4, 135) = 0.277$, $p = .893$, nor there was a significant interaction between the text type and reading condition, $F(4, 135) = 0.878$, $p = .479$. However, the post hoc analysis conducted on each pair, using Tukey and Scheffe tests, did not show any significant differences between the compared pairs. Subsequently, despite the reading condition the participant was in, he would always take more time to read the low-frequency text than the high-frequency text. The participants spent 160.60 seconds reading the LF text and 151.53 seconds reading the HF text (see Table 2). Further, the pair means in Table 2 for the five reading conditions show that the participants in reading condition 3—compared with the other groups, in which short vowels and *shaddah* were provided with the text—spent less time, on average, reading the two texts (146.07 and 148.68 milliseconds for the HF and LF texts, respectively). However, both groups, the plain one and the vowelized one, spent on average the same time to read the HF text (146.87 and 146.07 respectively). This

result is inconsistent with the proposed assumption that beginning readers should require more time to read a plain text than to a vowelized text due to the heterophonic homographic words in Arabic, particularly with the garden-path sentences in the text.

The partial eta squared value (ηp^2) was calculated as a measure of effect size for the text type variable, the word frequency. Its value of 0.04 is considered to be of small to medium effect size (Kotrlik & Williams, 2003). It indicates that 4 % of the total variance in the dependent variable, the reading time, is attributed to the manipulated word frequency.

Table 2. *Cell and marginal means on the reading time test by reading condition and text*

Group	Reading Condition	Text				
		High Freq.		Low Freq.		
		M	***SD***	***M***	***SD***	**Marginal**
1	Plain: no short vowels or *shaddah*	146.87	69.49	156.33	73.67	151.60
2	Fully consonantly: with *shaddah* only	150.96	79.38	173.32	111.70	162.14
3	Vowelized: short vowels and *shaddah*	146.07	76.63	148.68	67.77	147.38
4	Vowelized: short vowels, with no *shaddah*	162.46	87.20	169.64	79.23	166.05
5	Wrongly vowelized: wrong short vowels and *shaddah*	151.62	78.01	154.92	82.01	153.27
	Marginal Means	151.53	77.32	160.60	83.45	156.06

Reading Comprehension

For questions 1b and 2b on the recalling test data ("Is there a significant difference in the reading comprehension, as measured by the number of propositions, of fourth graders when reading a vowelized versus an unvowelized text, and when reading a high-frequency versus a low-frequency text?"), the analysis on the number of propositions in general did not reveal any significant results: there were no main effects for text type, $F(1, 128) = .022$, $p = .883$, or reading condition, $F(4, 128) = 0.371$, $p = .829$, nor there was a significant interaction between text type and reading condition, $F(4, 128) = 0.508$, $p = .730$. Regardless of the text type and reading condition, the participants on average performed the same in recalling the texts' propositions. In fact, the differences between the marginal means for the text type and between the pair means for every reading condition, as shown in Table 3, are very small, when we take into account that the measurement scale adopted in the study involved one point for each meaningful proposition recalled. Therefore, a 0.12 difference between the marginal means of the HF and LF texts (14.46 and 14.58, respectively) and the roughly one-proposition difference between the pair means for every reading condition (Table 3) are equivalent to a difference of 0.12, and one proposition, respectively.

Table 3. *Cell and marginal means on the recall test by reading condition and text*

Reading Condition	**Text**				
	High Freq.		**Low Freq.**		
	M	***SD***	***M***	***SD***	**Marginal**
1	13.90	9.97	13.74	10.54	13.82
2	14.89	8.28	15.19	9.45	15.04
3	15.48	7.65	14.44	6.30	14.96
4	14.44	9.61	14.63	8.89	14.54
5	13.60	9.23	14.92	8.57	14.26
Marginal Means	14.46	8.95	14.58	8.75	14.52

For questions 1b and 2b on the multiple-choice data ("Are there any significant differences in the reading comprehension, as measured by the number of correct answers, of fourth graders when they read a vowelized versus an unvowelized text, and when they read a high-frequency versus low-frequency text?"), the analysis on the number of correct answers data revealed a significant main effect for text type (HF vs. LF) $F(1, 134)= 21.80$, $p= .000$, $\eta p^2= 0.14$, but not for reading condition $F(4, 134) = 0.28$, $p= .89$, nor for the interaction between text type and reading condition, $F(4, 134)= 0.61$, $p= .65$ (Table 4). Examining the marginal means for the HF and LF texts shows that the participants on average scored higher on the HF text, with a mean= 6.44, versus a mean= 5.56 for the LF text. However, even with the reported large effect size value of 0.14 (Kotrlik & Williams, 2003), the marginal means shows only a 0.88 unit difference, which is a very slight difference when the measurement scale adopted is taken into account. The current study adopted a measurement scale that involves one point for each correct answer; thus, a 0.88 unit difference is equivalent to a difference of 0.88 correct answer points. However, the post hoc analysis conducted on each pair, using Tukey and Scheffe tests, did not show any significant differences between the pairs of comparison.

The partial eta squared value (ηp^2) of 0.14 indicates that 14 % of the total variance in the dependent variable, number of correct answers, is accounted for by the manipulated word frequency variable.

Table 4. *Cell and marginal means on the multiple-choice test by reading condition and text*

Reading Condition	**Text**				
	High Freq.		**Low Freq.**		
	M	***SD***	***M***	***SD***	**Marginal**
1	6.81	2.52	5.42	2.17	6.11
2	6.43	2.53	5.79	2.60	6.11
3	6.60	2.22	5.70	2.20	6.15
4	6.29	2.32	5.32	2.55	5.80
5	6.08	2.17	5.58	2.10	5.83
Marginal Means	6.44	2.35	5.56	2.33	6.00

General Results

Two main findings were revealed by the analysis: one is that vowelization is neither attributed positively nor negatively to the reading process of beginning readers, as represented by the fourth-grade students. That is, the supplemented vowelization did not affect their reading process for comprehension, as was measured by the time it took the fourth grader to read the text, or by the number of propositions recalled and the correct responses scored. Additionally, the only factor that played a role in the reading process of beginning readers was word frequency. Its role was observed with the reading time, and with the reading comprehension, as assessed by the correct responses scored, although its effect might not be practically affected due to the observed sizeable difference between the means and the measurement scales employed in the study. Furthermore, insignificant results were observed with the other comprehension assessment procedure—the recall test—which did not show such a difference. Such an effect of word frequency on the reading comprehension process of beginning Arabic readers indicates that students' reading experience, as reflected by word familiarity, in terms of its frequency, was obviously involved in such a process. This subsequently drew the researcher's attention to investigate the role of reading experience among the beginning readers, in terms of the type of print exposure those readers were familiar with. That is, the extent to which the familiarity with the print type (text representation) that the beginning Arabic readers were exposed to would affect the way they build a mental representation of the text. As was earlier laid out, beginning Arabic readers' performance did not differ according to the type of text representation, in terms of vowelization and diacriticizing. Their performance was the same, on average, whether they read a plain text or a vowelized text. However, in order for the researcher to isolate the effectiveness of short vowels per se, a strict sound controlling procedure ought to be followed, even if this procedure would lead the researcher to include unusual reading conditions, in which the texts are presented in a way that beginning Arabic readers might not be used to. For example, in one of the reading conditions, the text was supplemented with only short vowels, and no diacritics, such as *shaddah* or *skun*, were included. This raised a concern over the manipulation followed in Experiment 1 for control purposes: whether the manipulation of short vowels and *shaddah* (the third reading condition in the design) without the *skun* diacritic was insufficient to exclude the role of short vowels in the reading process of beginning readers, especially when we know that the term "vowelizing" (which should mean "providing the

text with short vowels only"), in a repeated uncontrolled procedure, would add *skun* (which means void of any short vowels) as part of the vowelization. Thus, adding the *skun* and *shaddah* diacritics along with the short vowels to the consonants when vowelizing a text would help to assess whether the Arab children's reading process, particularly reading comprehension, is a habitual act that is directed, not only by the presence and absence of short vowels but rather by the diacritics, which represent both the presence and absence of the missing short vowels, the diacritics, *skun*, and *shaddah*, from the Arabic orthography. In other words, would the reading comprehension process of beginning readers be affected by how the text is printed and exposed to those children, rather than claiming that the effect should be attributed to short vowels alone? Therefore, a follow-up experiment in which the vowelization was manipulated differently was necessary in order to respond to such a concern. The experiment added another reading condition in which the text's consonants were fully vowelized and discretized (to adhere to how previous studies controlled the reading conditions). Accordingly, a reading condition in which the text is presented in a familiar form that beginning readers of fourth grade have experienced should help in determining the extent to which reading experience is the operating factor in their reading comprehension process. Therefore, a reading condition in which the text was provided with short vowels, *shaddah*, and *skun* was constructed and tested.

Experiment 2

Participants. A different sample of 38 fourth graders drawn from exactly the same population in Experiment 1 participated voluntarily in this experiment. Only the data of 25 participants were analyzed due to students moving or transferring, or attendance circumstances. They were offered R 20 as compensation for their participation. None of them had ever participated in a similar study.

Materials. The same methodology adopted in Experiment 1 was applied in Experiment 2, in terms of text formats, measures, design and procedure, with exceptions only in how the two texts, HF and LF, were presented. That is, the same texts were supplemented with short vowels, *shaddah*, and *skun* (fully vowelized and diacriticizing). The vowelization and diacriticizing of the two texts were assessed and judged by a team of Arabic experts and reading teachers in primary grades (Table 5).

Table 5. *Reading conditions*

6	fully vowelized and diacriticized	عَبْدُالْعَزِيْز يَعِيْشُ هُوَ وَعَائِلَتُهُ فِيْ قَرْيَةٍ مِنْ ... السَّعُوْدِيَّةِ

Results. As can be seen in Table 6, the participants spent 133.76 seconds on average reading the high-frequency text and 134.56 reading the low-frequency text; note the small difference between the two means (0.8 milliseconds difference). However, incorporating the current data of the fully vowelized and diacriticized reading condition with the previous reading conditions and reanalyzing the data show the following results: there were no significant main effects were found for text type, $F(1, 160) = .817$, $p = .37$, or for reading condition $F(5, 160) = 0.62$, $p = .68$, nor there was a significant interaction between text type and reading condition, $F(5, 160) = 0.79$, $p = .56$. Subsequently, the participants' performance, in terms of their reading time for the two texts, was on average the same. However, observing the marginal means and the mean values for both texts (HF and LF) for all groups together and for group 6 individually shows that the participants, in general, took longer to read the low-frequency text than the high-frequency text (marginal means: 148.62 and 156.24, respectively; these values are after summing up the values for all reading conditions). Further, the participants in reading condition 6 (group 6) took less time on average to read both texts, compared with the other groups (133.76 seconds to

read the high-frequency text and 134.56 to read the low-frequency text; see Tables 2 and 6).

Table 6. *Cell and marginal means on the reading time test by reading condition and text for group 6*

Reading Condition	**Text**				
	High Freq.		**Low Freq.**		
	M	***SD***	***M***	***SD***	**Marginal**
6	133.76	51.34	134.56	52.05	134.16

Recall Test

As can be seen in Table 7, the participants on average recalled 16.88 propositions in the high-frequency text, and 15.72 propositions in the low-frequency text; note the small difference between the two means and the measurement unit in the scale (only 1.16 propositions difference between the means). However, incorporating this data of the fully vowelized and diacriticized reading condition with the previous reading conditions and reanalyzing the data show the following results: no significant main effects were found for text type, $F(1, 156)= 0.03$, $p= 0.87$, or for reading condition, $F(5, 156)= 0.29$, $p= 0.92$, nor there was a significant interaction between text type and reading condition, $F(5, 156)= 0.40$, $p= 0.85$. Subsequently, their recalling was not affected by the type of text they read or the reading condition they were in; their performances on average were the same.

The marginal means (Table 7) show that the groups in general scored the same (marginal means: 14.87 and 14.77 for HF and LF, respectively; these values are after summing up the values for all reading conditions), with a 0.09 difference, which means a 0.09 unit difference equivalent to a difference of 0.09 propositions. However, the data analysis shows that the participants in group 6 recalled, to some degree, more propositions in both texts than the participants in the other reading conditions (16.88 in the high-frequency text and 15.72 in the low-frequency text); this was particularly noticeable with the low-frequency text. However, there was only a 1.16 unit difference between the two marginal means for the LF and HF texts, which equals a 1.16 unit difference.

Table 7. *Cell and marginal means on the recall test by reading condition and text for group 6*

Reading Condition	**Text**				
	High Freq.		**Low Freq.**		
	M	***SD***	***M***	***SD***	**Marginal**
6	16.88	9.31	15.72	9.43	16.30

The Multiple-Choice Test

The mean values of correct answers showed that the participants on average scored higher on the HF text than on the LF text (6.84 for the HF text and 6.48 for the low frequency text); note the very small difference between the two means (the 0.36 difference is equivalent to a difference of 0.36 correct answer points). However, incorporating this data of the fully vowelized and diacriticized reading condition with the previous reading conditions and reanalyzing the data show the following results: a significant main effect was found for text type, $F(1, 159) = 19.91$, $p = .000$, $\eta p^2 = 0.111$, but not for reading condition $F(5, 159) = 0.59$, $p = .71$. Further, there was no significant interaction between text type and reading condition, $F(5, 159) = 0.76$, $p = .58$. Examining the means shows that the participants on average scored higher on the HF text than on the LF text (marginal means: 6.51 and 5.72, respectively; these values are after summing up the values for all reading conditions). Note that there was only a 0.79 unit difference between the marginal means for the LF and HF texts, and that the measurement scale involved one point for each correct answer; therefore, a 0.79 unit difference was equivalent to a difference of 0.79 correct answer points. However, conducting a post hoc analysis on every pair using both Scheffe and Tukey tests did not show any significant differences between the compared pairs. That is, the participants did well on the high-frequency text, regardless of the reading condition they were in and which text they read first. Further, generally speaking, the participants in group 6—the reading condition in which the participants read a fully vowelized and diacriticized text—scored higher, to some degree. This was particularly noticeable with the low-frequency text, compared with the other groups (6.84 and 6.48 for the HF and LF texts, respectively), but still with very close means, given the measurement unit of the scale, in which each correct answer was given one point (Table 8).

The reported partial eta squared value, ηp^2, is considered to be a value of a medium effect size (Kotrlik & Williams, 2003), and indicates that 11 % of the total variance in the dependent variable, number of correct answers, is attributed to word frequency variable.

Table 8. *Cell and marginal means on the multiple-choice test by reading condition and text for group 6*

Reading Condition	**Text**				
	High Freq.		**Low Freq.**		
	M	***SD***	***M***	***SD***	**Marginal**
6	6.84	2.29	6.48	2.14	6.66

General Results

Despite the non-significant results observed over the reading time variable after adding group 6's data to the analysis, the marginal means between the text, and the pair of means for each group did show noticeable differences in the amount of reading time between the texts (see Tables 2 and 6). Fourth graders always took more time to read texts in which 10% of its words were of low-frequency. Thus, we could say that word frequency affects the reading process of the less experienced and skilled Arab readers (beginning readers), as reflected in the reading time it takes them to read a text. Further, the supplemented vowelization did not affect their reading process for comprehension, as was measured by the time it took the fourth grader to read the text, or by the number of propositions

recalled and the correct responses scored. The statistically nonsignificant effect of the reading condition variable on the three dependent variables, reading time, number of propositions recalled, and correct responses scored, was trivial. The Partial Eta Squared value, ηp^2, was found to be between 0.011 and 0.008, which means that the reading condition variable accounts for 1% to 0.8 % of the variance of those dependent variables. Additionally, the only factor that played a role in the reading process of beginning readers was word frequency. Its role was observed with the reading time, and with the reading comprehension, as assessed by the correct responses scored. Although its effect might not be practically affected due to the observed sizeable difference between the means and the measurement scales employed in the study, a percentage proportion of 11 to 14 % of variance in the number of correct answers is explained by the manipulated word frequency factor.

However, giving beginning Arabic readers a plain text, with 10% percentage of its vocabulary of low frequency, did not affect their recalling of the text's propositions, nor did it affect severely their understanding of the text, as was observed from the close mean values.

Another observation worth mentioning is that it took the less experienced Arabic readers less time to read texts that were both vowelized and diacriticized, as can be observed in Group 6, which was asked to read the versions of texts with short vowels, *shaddah*, and *skun* together; this result is not in agreement with a previous study by Al-Fahid (2000), which claimed (from examining the reading rates of some individual participants in his study) that adding short vowels and diacritics to the consonants prolongs the reading process of Arab adults as they read fully diacriticized text. Further, it was noticed that Group 6 had smaller differences between the pairs of means (the high- and low-frequency texts) for each reading condition (133.76 for HF; 134.56 for LF). Can we say that the expected effect of the word frequency in processing a text diminishes when the orthography of the texts is transparent? Oppositely, when the orthography of the texts presented is plain or partially presented, does the effect of word frequency become larger?

Further, the reading process of the low-frequency texts becomes much longer when the orthographies of the texts only present consonants, have only short vowels presented, or have incorrect vowels presented (see Table 2). The readers took 173.32 seconds to read the only consonantly presented text; 169.64 seconds to read the texts with only short vowels presented; and 154.92 seconds to read the wrongly vowelized text. Therefore, can we say that children's Arabic reading learning and reading experience were accustomed to either plain or fully vowelized and diacriticized texts (sight words), and that they were affected by the experience of their reading exposition to print, which they brought to the reading conditions?

This finding is in accordance with a previous study (Seraye, 2004) conducted on Arab adult readers when reading connected texts, which showed that the only variable that played a role in their reading processing as reflected in the reading time it takes them to read a text was word frequency. However, in terms of reading comprehension, as can be realized by the products of their reading process, their performance in recalling more information from the text and getting the correct responses, showed, on the surface, conflicting results. However, examining the analysis closely resolves such a conflict. The analysis reveals that the reading comprehension of beginning Arabic readers was not affected by missing short vowels from text, nor it was affected by the low frequency: their performance, on average, was always the same. This conclusion is more obvious when the beginning Arabic readers were asked to recall as many propositions, as they could. However, this was not always the case. In the multiple choice test, the result showed that

beginning Arabic readers' reading comprehension was correlated with word frequency, and not with the presence or absence of short vowels. On average, they scored higher with the high-frequency texts. That is, they comprehended high-frequency texts better than the low-frequency ones. However, the differences between every pair of means for all groups were still very small. Further, the post hoc analyses conducted on those pairs of means did not reveal any significant differences between the pairs of means. Furthermore, even when accepting the small differences found between the means (bowing to the reported large effect size), the average scores of 6.51 for the high-frequency text and 5.72 for the low-frequency one are far from the maximum score of 10 in the multiple-choice test, which indicates that their performance is obviously average, if not quite weak.

In conclusion, the current data does not support attributing the high scores in the multiple choice data to the presence of short vowels (even to the short vowels and diacritics in combination). This finding is not in accordance with previous studies, such as Abu-Rabia's (1999) and (2001) studies, as well as Shimron and Sivan (1994) study, which all claimed—except with caution, as did Shimron and Sivan's study in their comments on the results—that short vowels have a positive effect on the reading comprehension of both adults and children (as represented by second graders), although they neither manipulated the short vowels to a degree that should isolate their effect, nor did they reinterpret, cautiously, the slight difference found between the means. Such a conflict can be explained in terms of the controlling procedures of the reading conditions and the reading texts used, which did not take into account that short vowels and diacritics are different forms that represent different aspects of the orthography, nor did it take into account the involvement of word frequency in text reading difficulty and thus the necessity of having similar texts (as can be achieved by using a matching procedure) in their experimental design. Further, even after accepting their experimental design, as mentioned before, the differences between the means reported for the groups that read the vowelized text versus those that read the unvowelized one are very small, once we take the measurement unit into account. In fact, some of the researchers (Shimron & Sivan, 1994) stated explicitly that the difference was nearly significant, since the $p = 0.05$.

On the other hand, Abu-Hamour's (2013) study showed that fifth-grade students, both poor and skilled, performed better with the vowelized text, and the benefit was higher for the skilled readers. The difference between the means was large enough to attribute such a difference to the dependent variable (24.19 for the vowelized text vs. 7.88 for the unvowelized one). However, there were still some questionable observations in the analysis. For example, the skilled students scored 24.19 on average, compared with 7.88; however, the score range was from 18 to 43, an indication that that 24.19 is still far from the maximum score; in fact, it is almost close to the minimum score (18). Second, the researchers manipulated the diacritics to be part of the short vowels and considered the fully vowelized text to be supplemented with short vowels and diacritics. In fact, they even considered the case markings to be part of this vowelization. Therefore, attributing the positive results to the presence of short vowels is neither accurate nor valid. The researchers did not isolate the role of short vowels accurately. Further, the authors used a within-subject design and different texts, and word frequency was not manipulated, despite the fact that word frequency is implicated in the text-reading process (Seraye, 2004).

General Discussion

The only variable implicated in the less experienced/skilled readers' reading process, as represented by fourth graders, was word frequency, which was obvious in the reading time and reading comprehension product data as measured by the number of correct answers. Indeed, the effect of word frequency was also found with the more experienced

readers, as represented by Arab adult readers at the graduate and postgraduate academic levels (Seraye, 2004). The opaqueness and depth of the texts, when presented without suitable short vowels and diacritics, did not affect the children's reading process, as reflected in the time load needed to process the texts, nor did it interact with the type of text they read, in terms of word frequency. Rahbari and Senechal (2009) arrived at the conclusion that "it is not the orthographic depth of a language, but it is the reading skills, or more precisely the experience with reading words, as well as a task demand that affect processes used to read" (p. 523).

Previous literature, in general, has demonstrated that sensitivity to word frequency was found in tasks such as word naming and word recognition. High-frequency words are read more quickly than low-frequency words, which has been a consistent finding for different orthographies that both differ from and resemble Arabic orthography (Seraye, 2004, for Arabic; Raman & Baluch for Turkish, 2001; Baluch, 1996, for Persian).

In fact, well-established research on eye movement has shown that the fixation durations for high-frequency words while reading a sentence or passage are shorter than the fixation durations for low-frequency words; this was documented for both adults and children readers (e.g., Joseph, Nation, & Liversedge, 2013; Rayner et al., 2006; Rayner & Duffy, 1986; Rayner, Sereno, & Raney, 1996; Sereno & Rayner, 2000). Similarly, predictable words take short duration times to fixate, compared to their non-predictable counterparts (e.g., Balota, Pollatsek, & Rayner, 1985; Miellet, Sparrow, & Sereno, 2007; Rayner & Well, 1996).

Thus, these higher time fixations for low-frequency words are assumed to add more time to the process of reading the text and subsequently prolong its reading time process. This effect was more salient due to the controlling procedure for word frequency as a variable adopted in the current study by intentionally inserting low-frequency counterpart words in one of the versions of the text. Therefore, we can say that reader's experience, as reflected in his/her lexical representation of the word—word familiarity, specifically—plays a major role in the reading process of the less experienced Arabic readers, as it did with the more experienced Arabic readers (e.g., Seraye, 2004).

Such an effect should not be surprising, since individual words and their characteristics were found to play a central role in the reading process of different orthographies (see for example the three experimental studies by Seraye, 2004, for Arabic; and Rahbari and Senechal, 2009, for Persian). The ease and speed in accessing the mental lexicon from memory during reading affects the reader's reading fluency and comprehension (Perfetti, 2007).

This finding can be justified by the explanation given by the so called restricted-interactive theory proposed by Perfetti (1994), which presents—in the researcher's opinion—a suitable framework for explaining the effects of the reader's experience, as reflected in word familiarity, on the reading processing of texts. Perfetti (1994) stated that "learning to read is the acquisition of increasing numbers of orthographically addressable words (quantity acquisition) and the alteration of individual representations along quality dimensions: specificity and redundancy" (p. 857). His theory is based on two principles: specificity (an increase in the number of position-correct specific letters in a representation) and redundancy (the increasing establishment of redundant phonemic representations), which would lead to a quality word representation in a reader's mind and subsequently to a resource-cheap reading. As noted by Perfetti (1994), "[A]s individual words become fully specified and redundant, they move from the functional lexicon, which allows reading, to the autonomous lexicon, which allows resource-cheap

reading" (p. 857). In Macleod and Kampe's (1996) words, "automaticity is a direct function of experience" (p. 132).

However, the effect of word frequency on the reading process was found to be equally present, regardless of the boundary of exposure to print, whether limited, as was the case with fourth graders, versus unlimited, as was the case with skilled adult readers at the undergraduate and graduate academic levels.

For reading comprehension, as assessed by the two tests measuring the number of propositions and the correct answers, the absence and presence of short vowels and diacritics did not implicate the reading comprehension process of the less experienced readers, as represented by the fourth graders. Further, their reading comprehension, although found to be significantly correlated with word frequency, was not severely affected, as can be seen from the closeness of the mean values. Such a finding can be attributed to the fact that beginning Arabic readers use their knowledge of the morphological aspects of the language in comprehending the text; indeed, they exploit their knowledge of the *trilateral/quadrilateral* root of Arabic words that is needed to comprehend the text. A study by Badry (1982) arrived at the conclusion that Arab Moroccan children from ages 3 to 6 "are aware of the underlying morphological root in their spoken language, and this awareness was reflected in the production stage of their acquisition" (Seraye, 2004, p. 83). Further, in their comparison study between dyslexics and normal readers in sixth and eighth grades, Abu Rabia and Abu-Rahmoun (2012) reached to the conclusion that, while reading, both dyslexic and normal readers rely heavily on the morphological aspects of the Arabic language—particularly the root. This reliance on the roots of Arabic words appears more clearly with the reading materials that were presented unvowelized, particularly observed with the normal Arab readers (Abu Rabia & Abu-Rahmoun, 2012). Their conclusive statement is that, "[r]oots of words are the key to initial lexical access" (Abu Rabia & Abu-Rahmoun, 2012, p. 1265). Furthermore, well-documented research in languages with alphabetic-based writing systems revealed that children in fifth grade and up employ morphological information to infer the meanings of unfamiliar and low-frequency words while reading (McCutchen & Logan, 2011).

Therefore, by combining the findings in the current investigation with those from previous research, we can reach a conclusive statement: in the absence of short vowels and diacritics from print, beginning readers still can compensate for such an absence by relying on their linguistic knowledge, particularly the morphological roots of Arabic words, and the textual context to understand the text.

Limitations

The current study's findings should be restricted to only fourth graders, particularly male fourth graders population, whose reading levels are at the fourth-grade instruction reading level, and should not be generalized to fourth graders in general. Further, the interpretation should be restricted to students who have mastered the reading skill and just started to read for learning across the curriculum. Therefore, the roles of vowelization (short vowels plus diacritics) and word frequency in the reading process of less-skilled fourth graders should be assessed for two reasons: to help determine the degree to which exposing such readers to plain reading materials would affect their reading comprehension, and subsequently, whether they would be able to compensate for such an effect by exploiting their knowledge of the morphological roots of Arabic language.

Additional caution should be taken into account, regarding the finding of no explicit additional benefits regarding the presence of short vowels and diacritics for the reading comprehension of Arabic readers, both experienced and less experienced readers. The

benefits should be interpreted in the context of silent-mode reading tasks and not be extended to other reading modes such as reading accuracy tasks.

Recommendations

The current study targeted beginning readers, as represented by skilled fourth-grade male students; thus, replicating the same procedure for non-skilled readers is recommended. Further, due to the segregated nature of the education system in Saudi Arabia, replicating the same procedure for female fourth graders of skilled and non-skilled reading levels is encouraged. Additionally, according to my aforementioned explanation, the small subscripts and superscripts in written Arabic words do not represent only short vowels, but also diacritics (such as *skun*, *shaddah*, *maddah*) as well as case ending markers that take the shape of short vowels and *skun*. Therefore, the term "fully vowelized", as reported in the current and previous studies, needs to be given a new meaning when investigating its effect. That is, the role of short vowels needs not be investigated separately from the other diacritics included in the fully vowelized reading condition.

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The Effect of Formative Testing and Self-Directed Learning on Mathematics Learning Outcomes

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Abstract

The purpose of this research was to determine the effect of formative testing and self-directed learning on mathematics learning outcomes. The research was conducted at an elementary school in central Jakarta during the 2014/2015 school year. Seventy-two fourth-grade students who were selected using random sampling participated in this study. Data were obtained through testing and were analyzed using a two-line analysis of variance (ANOVA) according to the treatment design and level of self-directed learning. The results showed that (1) mathematics learning outcomes differ between students who are given formative essay tests and those who are given formative multiple choice tests; (2) there is an interaction effect between formative testing and self-directed learning on mathematics learning outcomes; (3) students with high levels of self-directed learning have better learning outcomes when given formative essay tests than when given formative multiple choice tests; and (4) students with low levels of self-directed learning show no difference in mathematics learning outcomes based on whether they are given formative essay tests or multiple choice tests.

Keywords: Formative test, Self-directed learning, Mathematics outcomes.

Introduction

The *Trends in International Mathematics and Science Study* Mullis, Martin, Foy, & Arora, 2011) conducted in 2011 indicated that Indonesia's students have only a basic knowledge of mathematics, which is not sufficient to solve routine questions and problems or to manipulate mathematic forms and apply the necessary logical strategies. Indonesian students rank 38 out of 42 countries in mathematical achievement, with an average score of 386 based on the TIMSS scales (which range between 300 and 700). Other evidence is available from the results of *The Program for International Students Assessment* (PISA), which reported in 2012 that Indonesian students scored 375 for mathematical capability.

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Other student achievement indicators include the national examination, which is conducted every year and has resulted in scores below 7, which are unsatisfactory. The average mathematics scores on the national examination (scored on a scale of 0-10) for public elementary schools in Jakarta are shown in Table 1 below.

Table 1. *The Average National Examination Mathematics Scores for Public Elementary Schools in DKI Jakarta and Kepulauan Seribu for 2011/2012 and 2012/2013*

	Academic year	
Region/City	**2011/2012**	**2012/2013**
Central Jakarta	7.04	6.73
North Jakarta	6.77	6.64
East Jakarta	7.33	7.34
West Jakarta	6.57	6.55
South Jakarta	7.29	7.13
Kepulauan Seribu	6.24	6.32
Average	6.87	6.78

Source: www.simdik.info/hasilun/index.aspx.

The data above show that mathematics achievement is relatively low. Students struggle with mathematics for several reasons, including the abstract nature of mathematical figures, the fact that most students view mathematics as a frightening subject, students' difficulty in comprehending mathematics or lack of interest in studying mathematics, and students' disabilities related to mathematics learning skills. The National Council for Accreditation of Teacher Education (2003) stated that mathematics teachers should "possess a deep understanding of how students learn mathematics and use the pedagogical knowledge specific to mathematics teaching and learning" (as cited in Osborne, 2015, p. 23).

Osborne (2015) concluded that educators must embrace current best practices for teaching mathematics. To do so, educators must immerse themselves in current research, strive to incorporate the best methods of mathematics instruction, and become educational experts regarding the Common Core State Standards for Elementary School Mathematics. Davis (2015) suggested that in mathematics, a profound understanding of the subject matter taught is a necessary but far from sufficient precondition for providing insightful instruction. Rahman and Lee (2014) explain that the majority of teachers agree that communication in the teaching and learning process is important for enhancing students' understanding. Effective communication, improved students' understanding of the topics being taught, which allowed them to solve high-level questions correctly. According to Lai, Zhu, Chen, and Li (2015), mathematics is among the most objective, logical, and practical academic disciplines. However, in addition to cognitive skills, mathematical problem solving also involves affective factors. Some research supports the conclusion that mathematics anxiety may impede mathematics performance by affecting cognitive process. Mathematics is about problem-solving. Mathematics talks about how to find the best answer of mathematical questions into mathematical statements. The accuracy of answer given by an individual depends on the depth of mathematical knowledge he/she decision (Tella, 2008).

Büyükkarci (2014) stated that evidence indicates that high-quality formative assessment has a powerful impact on student learning. In general terms, formative assessment is aims to help students improve their own learning. In practice, formative assessment is a self-reflective process that aims to promote student achievement.

The formative test is a measurement tool for determining learning quality and encouraging student learning activity. When formative evaluations are conducted frequently during the learning process, student learning outcomes are improved. Badger and Thomas (1992) explain that assessment motivates students to study and includes at least two purposes: encouraging understanding and an increased frequency of studying and determining a method of subject matter learning that the student can understand. Formative assessment (FA) is intended to help learners and teachers track students' progress in an informal way and to take remedial action when learning difficulties emerge (Srivastava, Waghmare, & Vagha, 2015). Formative assessment motivates the student to be more focused and provides an opportunity to monitor different aspects of student learning (Lucas & Spencer, 2014).

Gronlund and Linn (1990) explain that the purposes of assessing learning progress are to (1) establish learning output goals; (2) determine learning needs; (3) monitor learning development and difficulty; (4) assess learning outcomes; and (5) use the evaluation outcome to develop study and learning aids. These purposes mean that the development and implementation of learning aids also serve to influence learning quality and productivity.

According to Arifin (2009), schools generally use only one of many available assessment tools for evaluations: the written test. The written test can take two forms: a subjective test and an objective test. Both tests have different strengths and weaknesses. Essay (subjective) tests require students to organize, interpret, and connect the knowledge that they already have. They also require students to consider, recognize, and improve their existing knowledge while applying a high level of creativity. In contrast, multiple choice (objective) tests examine students' knowledge about specific concepts and skills (Wiersma & Jurs, 1990).

The use of formative assessment tools in the form of essay and multiple choice tests has been predicted to affect students' self-directed learning. Self-directed learning is an intentional psychological activity that students direct and control with the aim of acquiring knowledge and understanding about a specific subject. Students' level of motivation for self-directed learning has an effect on their learning outcomes, which are indicators that the student's knowledge and understanding of a specific subject is improving.

Gronlund and Linn (1990) noted that tests are systematic procedures for measuring behavior or for determining how an individual acts when compared with others or when certain assignments need to be completed. Furthermore, Morrow, Mood, Disch, and Kang (2005) stated that a test is an instrument that is used to measure a specific skill. Such instruments can include written, oral, physiological, and/or mechanical devices. These opinions are supported by Hopkins (1986), who argue that a test is an instrument, tool or procedure that contains assignments that students should address and that provides results that can be used to measure certain aspects of students' knowledge.

Cronbach (1994) and Nitko (2001) stated that a test is a systematic procedure for monitoring and describing one or more student characteristics using a numerical scale or classification scheme and/or a numerical standard or category system. Anastasi and Urbina (1997) wrote that a test is an instrument with objective standardization, and its results can be used broadly (for example, to compare psychological circumstances or individual behaviors). Regarding the function and purpose of tests, Popham (1995) stated that they are useful for diagnosing students' strengths and weaknesses, determining student development, deciding student rankings, and determining the efficacy of further

learning. In fact, Hopkins (1986) cites the final item on this list as the main purpose of testing in terms of quantifying student learning outcomes.

Regarding the function of tests, Gronlund and Linn (1990) stated that they can be classified into four categories: placement tests, formative tests, diagnostic tests and summative tests. A placement test is used to determine the student's ability at the beginning of the learning process; a formative test is used to monitor learning output; a diagnostic test is used to diagnose learning difficulty; and a summative test is used to evaluate achievements.

According to Gronlund and Linn (1990) and Boston (2002), formative assessment is designed to provide feedback to students and teachers during the learning process. This feedback should improve students' awareness of the differences between the purposes of instruction and the knowledge, understanding, and skills that they already have, and it should help them to achieve the purposes of learning. Furthermore, Gregory (2000) noted that formative tests aim to determine the degree to which the student is "formed" after participating in the learning process for a certain period of time. Formative testing is usually conducted throughout the learning program, that is, at the end of a teaching unit.

The subjective test is one of the best test types for determining scores that are affected by other's opinions or assessments. Essay tests require students to formulate their own answers; students cannot select a single correct answer but must answer in their own words. The responses to essay questions should be read one at a time, compared with the correct answer supplied by the test maker, and then scored according to previously provided guidelines. Stiggins (2001) stated that the essay test is a type of written test that consists of questions and requires students to create their own answers.

Hopkins (1986) noted that essay tests can provide insight into several student abilities: (1) the capability to think, analyze, synthesize, and evaluate; (2) the maximum capability for developing thinking skills; (3) the capability to argue/express opinions; (4) the capability for written expression; and (5) the maximum capability for naturally organizing logical thinking. Morrow et al. (2005) observed that the open-question nature of the essay test makes it very effective for measuring students' abilities to organize, analyze, synthesize and assess compared with other tests. Essay tests can also effectively measure participants' arguments and attitudes.

The essay test offers several advantages, such as (1) assessing the mental processes that students use to shape their ideas into correct answers, (2) measuring students' ability to answer a question in their own words, (3) encouraging students to actively learn and to arrange, construct and explain their logical thinking, (4) encouraging students to be courageous when making an argument and to construct their arguments in their own words, and (5) understanding how deeply the student understands and has addressed a problem based on the knowledge taught in the class.

In comparison, multiple choice tests are flexible and of high quality, which allows them to be used for many types of tests and examinations (Gronlund & Linn, 1990). Hopkins (2005) explained that multiple choice tests consist of two parts: incomplete questions or statements and two or more possible answers plus a few other answer options as decoys. The decoys serve to distract the participant when he or she is uncertain of the correct answer.

Cangelosi (2007) said that to facilitate a participant's ability to answer the questions, multiple choice questions should be composed according to certain guidelines, including (a) how the student is expected to select the option, (b) how many options may be selected for each question, (c) whether the answer options include one correct answer or the most

correct answer, and (d) other significant information (for example, whether predicting the answer is allowed).

Dodge (2009) explained that multiple choice tests are used in all areas that require written tests for several reasons: 1) the questions can be analyzed and scored efficiently, quickly and correctly; 2) participants are less hesitant to answer multiple choice tests compared with other test types; 3) questions with two or more possible answers are difficult to answer by guessing; 4) multiple choice tests can be used to measure higher-level skills, such as application and analysis; and 5) they can be used to measure some objective knowledge.

The multiple choice test has several benefits: 1) it can be used to assess several broad learning outcomes; 2) it does not allow the student to write or describe the answer, which minimizes guessing; 3) it prioritizes reading and thinking because the items make minimal demands on memory; 4) it allows students to deduce answers based on those provided; and 5) its use of decoy options can determine whether the student possesses the relevant perception and knowledge (Nitko, 2001).

The factors that affect mathematics learning outcomes in elementary schools are tied to directed learning. Directed learning implies independence. Students in directed learning environments do not depend on someone else for their learning; their efforts are self-initiated, and they must take responsibility in their daily activities. Directed learning is also known as self- or autonomous learning. Seifert and Hoffnung, who were quoted by Eggen and Kauchak (2007), defined autonomy as the ability to control and arrange one's ideas and feelings, to freely act out of self-motivation, and to overcome a lack of self-confidence and self-doubt. Based on the research result, teachers with higher self-efficacy belief are different from those with lower self-efficacy belief. The difference can be seen from the level of efforts, persistence when handling different kinds of students, openness to new ideas and methods, believing in students' achievements and success, and building warm relationship with students rather than with their parents (Nurlu, 2015).

Nash (2014) stated that the idea of self-directed learning originated with Dewey's response to what he saw as the demands of a modern democratic society. His thinking influenced education at the turn of the twentieth century and continues to inform educational policy to this day. For Dewey (2012), the ideal aim of education in a democracy is the creation of self-control that can guide one's personal freedom to choose.

Self-directed learning is the effort to remove oneself from one's parents and find oneself through self-identification, which is the directed development of a stable and independent individual (Good & Brophy, 2007). The directed attitude is not egoistic or selfish; rather, it is a willingness and ability to develop one's own life. Self-directed learning is marked by the individual's ability to adapt his/her behavior, take responsibility, make his/her own decisions, show initiative and creativity, and be able to solve problems without intervention from others. Self-directed learning can occur under a number of conditions, including when: 1) teachers act as facilitators rather than as sources of content; 2) learners are involved in selecting learning resources and strategies, and 3) learners are involved in self-assessment of their learning outcomes (Knowles, 1975).

Petty (2009) described self-directed learning as a humanistic approach in which teachers serve as facilitators. The benefits of independence are that it encourages active learning and extends the responsibility for learning to the student. Furthermore, Scott (2006) and Tavani and Losh (2003) stated that independence/directed learning promotes a child's ability to select correct options, determine his/her options, and be responsible for her/his determination. Independent children have higher self-confidence and motivation, and their behaviors do not depend on anyone else. Van Merriënboer and Sluijsmans

(2009) concluded that instruction that provides a solid base for self-directed learning contains three elements: learners must (a) perform the tasks, (b) assess their task performance, and (c) select future tasks for improving their performance.

Independent learning is recognized as an important predictor of students' academic motivation and achievement. It is a pivotal construct in contemporary accounts of effective academic learning. Independent learning is essential to the learning process through which students direct their acquisition of academic knowledge (Winne, 1995).

Schunk (2005) argued that independent learning is a state or condition in which students pursue learning activities on their own without relying on others; this condition or state is always consistent, and self-directed learners are eager to learn anywhere. Independent learning is mostly driven by the student's own initiative, choice and self-learning responsibility.

Zimmerman (1990) defined independent learning as a process of learning that results from the influence of thoughts, feelings, strategy, and self-behavior that are oriented toward achieving a goal. Thomas (1993) suggested that independent learning is an unrestricted and responsible student behavior geared toward determining learning objectives, planning and implementing, and maintaining and assessing the results of learning activities without relying on others. Zimmerman (2008) viewed independent learning as a proactive process rather than a reactive event that happens to students due to impersonal forces such as teaching. Based on the above opinions, independent learning depends on the student's attitude and ability to complete learning activities independently or alone and be responsible for achieving a goal. Independent learning in mathematics results from a student's attitude and ability to learn mathematics independently, master a competency and be responsible for completing the task with reduced guidance from others (Cleary & Chen, 2009).

During the self-learning process, students require independence if the learning process able to progress properly and maximize student achievement. Metallidou and Vlachou (2010) said that self-learning is learning in which students are allowed to determine the learning goals; plan the learning process and the strategies using learning resources that he or she has chosen; make academic decisions; and perform activities that contribute to the achievement of learning goals.

Banarjee and Kumar (2014) stated that independent learning has an effect on academic achievement, including in mathematics. This effect occurs because children begin to believe that they have the ability, discipline, and enthusiasm to pursue achievement; as a result, they do not feel inferior and are ready to solve any problems that arise, and this attitude increases achievement. According to Banarjee and Kumar (2014), independent learning and academic achievement are positively correlated, and there is a significant positive relationship between independent learning and academic achievement in science. In the context of mathematics classrooms, students are challenged to solve tasks, to conceptualize their own opinions and to adapt strategies to task demands (Kramarski & Revach, 2009).

The research by Lopez Vargas, Hederich-Martinez, and Camargo Uribe (2012), Ocak and Yamaç (2013), Camahalan (2006), Metallidou and Vlachou (2010) and Çiftçi and Koza (2015) indicates that to improve and maintain mathematics learning outcomes, it is necessary to consider factors related to the students' independence with mathematics. When a student's level of independence is high, it will affect the results of that student's mathematics learning. The greater the student's independence, the higher the mathematics learning outcomes; conversely, the lower the student's independence, the lower his or her mathematics learning outcomes will be.

The research conducted by Yang and Li (2013) assessing the use of animated self-directed learning activity modules for children's number sense development found that even without a teacher's instruction in class, children can develop number sense through self-directed learning.

Research conducted by Munasco (2013) in Banda Aceh concluded that students' physics learning outcomes are better when essay tests are used than when multiple choice tests are used, after controlling for initial capability. The formative testing research conducted by Putri and Indra (2010) with elementary students in Palembang concluded that the students who were given essay tests showed higher mathematics learning outcomes than the students who were given multiple choice tests, after controlling for initial capability.

Method

This research aimed to determine the effects of and interactions between formative testing and self-directed learning and their relationship with the mathematics learning outcomes of elementary students.

The research was conducted in a public elementary school in central Jakarta. The research subjects were students who were in their first semester of fourth grade. The research began as an experiment to examine the validity of an instrument (which took the form of essay tests and multiple choice tests) for assessing learning outcomes.

The research method used was an experimental method with a 2 x 2 treatment-by-level design. The variables in this research were dependent variables (the formative tests), an independent variable (mathematics learning outcomes), and an attribute variable (self-directed learning). The formative tests (A) included two forms: a formative essay test (A_1) and a multiple choice test (A_2). Student self-directed learning (B) was classified as either high (B_1) or low (B_2). There were four groups tested: a group of essay tests and students with high self-directed learning (A_1B_1), a group of multiple choice tests and students with high self-directed learning (A_2B_1), a group of essay tests and students with low self-directed learning (A_1B_2), and a group of multiple choice tests and students with low self-directed learning (A_2B_2).

Table 2. *Design Treatment by Level*

	Formative test (A)	
Self-directed learning (B)	**Essay (A_1)**	**Multiple choice (A_2)**
High (B_1)	A_1B_1	A_2B_1
Low (B_2)	A_1B_2	A_2B_2

The two-treatment method was designed to determine the effect of the treatments on mathematics learning outcomes. The examined treatments were formative tests and independent/self-directed learning. The formative test treatment involved giving the students formative essay tests and formative multiple choice tests. Formative essay tests are tests that require students to create their own answers. Multiple choice tests provide several possible answers and require the student to determine which is correct. The formative multiple choice test that was used in this study provided four answer options for each question. The students' self-direction levels were assessed via a questionnaire.

The research sample pool comprised all of the students in the fourth grade at a public elementary school in central Jakarta. The sample was selected using a random sampling technique. Two classes were used as sampling sources for this research. Two classes were selected so that one class could take the formative essay test and the other could take the formative multiple choice test. Grade IV A was assigned to take the formative essay test,

and Grade IV B was assigned to take the formative multiple choice test. The students in Grade IV A and Grade IV B had the same relative academic capabilities because neither group of students was categorized as having superior skills. The sample population comprised 72 students.

To measure self-directed learning, the students were grouped according to whether they reported having high or low levels of directed learning. The sample included 40 students, 20 of whom took essay tests and 20 of whom took multiple choice tests. Ten students in each group were chosen randomly for the self-directed learning assessment.

The experiment was conducted using formative essay tests and multiple choice tests. The students who took the formative essay tests were tested 3 consecutive times at the end of each lesson, as were the students who took the formative multiple choice tests.

Furthermore, to avoid differences in test scores that may have been caused by the formative tests that were used for practice, the final test for each student group included a bundle of essay or multiple choice tests, as appropriate for the group. The data collection instruments were (1) a mathematics learning outcome instrument and (2) a student-directed learning instrument. The student-directed learning data were measured using a non-test instrument that used frequency scales with five options. These data were collected before the treatment. The data were intended to group the respondents according to their self-directed learning levels (high and low). The mathematics learning outcome data were measured using a learning outcomes test, which consisted of essay and multiple choice tests. Both tests were developed by the researcher and tested on students with characteristics similar to those of the research respondents.

Validity testing was conducted using tests of content validity and construct validity. Construct validity was tested using expert judgment. Content validity was tested by referring to the elementary school curriculum for fourth grade. The multiple choice questionnaire used a dichotomy formula based on biserial points. The tests were created using Microsoft Excel 2013 software (Microsoft Operations Pte, Ltd., Singapore, Reagents: Sistech Kharisma Company). The validity of each questionnaire was determined by comparing the correlation coefficient (r_{value}) with the critical biserial correlation number (r_{table}) based on a significance level of 5%, as follows: 1) if $r_{item} > r_{table}$ and $\alpha = 0.05$, then the item was considered valid; 2) if $r_{item} \leq r_{table}$ and $\alpha = 0.05$, then the item was considered invalid. Based on this calculation, 16 questions on the multiple choice test had a value of $r_{phi} > 0.355$ and a significance level of $\alpha = 0.05$. The validity test for the essay tests, based on the product moment formula, showed that the entire test (7 questions) had a value of $r_{value} > r_{table}$ (0.355) and a significance level of $\alpha = 0.05$. To determine the reliability of instrument, the Hoyt formula was used.

Before the hypothesis was tested, we conducted an analysis requirement test, which consisted of a normality test and a homogeneity test. The normality test used the Lilliefors formula. The data were found to have a normal distribution when $L_0 < L_{table}$ with a significance level of 0.05. The variance homogeneity test of Group Y for X_1 and X_2 was intended to test the similarity of two population variants with normal distribution patterns. The homogeneity of the data were tested using Bartlett's test. The data were homogeneous if $\chi^2_{count} < \chi^2_{table,}$ with a significance level of 0.05.

Results

The hypothesis was tested using a two-line variance analysis to examine the interactions, and then a one-line analysis was used to test the hypothesis regarding the simple effect. The two-line analysis results were used to test the hypothesis regarding the main effect, which was that the average learning outcomes of the student groups that took the formative essay tests would differ from those of the student groups that took the formative multiple choice tests. Furthermore, the hypothesis about the effect of the interaction between the formative test treatments and self-directed learning on mathematics learning outcomes was tested. The results for these hypotheses are summarized in Table 3 below.

Table 3. *Two-Line ANOVA Table for Mathematics Learning Results with α= 0.05 and α= 0.01*

					***F* table**	
Variance source	**JK**	**Db**	**RJK**	***F* value**	**α = 0.05**	**α = 0.01**
Inter A	114.568	1	114.568	5.38*	4.08	7.31
Inter B	589.114	1	589.114	27.66**	4.08	7.31
Interaction A x B	134.750	1	134.750	6.32*	4.08	7.31
Inside/within	852.000	40	21.300			
Total	1690.432	43				

The results of the two-line ANOVA above can be explained as follows:

1) *The mathematics learning results of the students who were given the formative essay test treatment differed from those of the students who were given the formative multiple choice test treatment.*

Based on the ANOVA results in Table 3 above, $F_{value} = 5.38$, whereas F_{table} with $\alpha = 0.05$ is 4.08. Thus, $F_{value} > F_{table,}$ which indicates that H_0 must be rejected because H_1 is accepted. Thus, there is a difference in the average mathematics learning outcomes of the students who received the formative essay test treatment and those who received the formative multiple choice test treatment. The average mathematics learning results for the students who took the formative tests was 71.60, whereas the students who took the formative multiple choice had an average mathematics learning result of 66.00.

2) *The mathematics learning outcomes differed between the students with high self-directed learning and those with low self-directed learning.*

The ANOVA results in Table 3 above show that $F_{value} = 27.66$, whereas the F_{table} at $\alpha=0.01$ is 7.31. Thus, $F_{value} > F_{table,}$ which shows that H_0 is rejected because H_1 is accepted. Therefore, there is a difference in the mathematics learning outcome averages between the group of students with high self-directed learning and the group with low self-directed learning. According to the mathematics learning test results, students with a high level of independence had an average formative essay test score of 83.4, while the average score on the formative multiple choice test was 70.7.

3) *The formative test type and self-directed learning have an interaction effect on mathematics learning outcomes.*

The ANOVA results above show that the F_{value} had an interaction effect AB=6.32, whereas F_{table} at $\alpha= .05$ was 4.08. Thus, $F_{value} > F_{table}$, indicating that H_0 was rejected and H_1 was accepted. It may be concluded that there is an interaction effect between the formative test type and self-directed learning. The effect of the interaction between the type of formative test and self-directed learning on mathematics learning outcomes can be seen in Figure 1.

The average F between the four groups of cells was 39.78, while the F_{table} at the level of α=0.05 is 2.84. Thus, $F_{count} > F_{table}$, meaning that H_0 is rejected and H_1 is accepted, indicating that on average, there were differences among the four groups of cells.

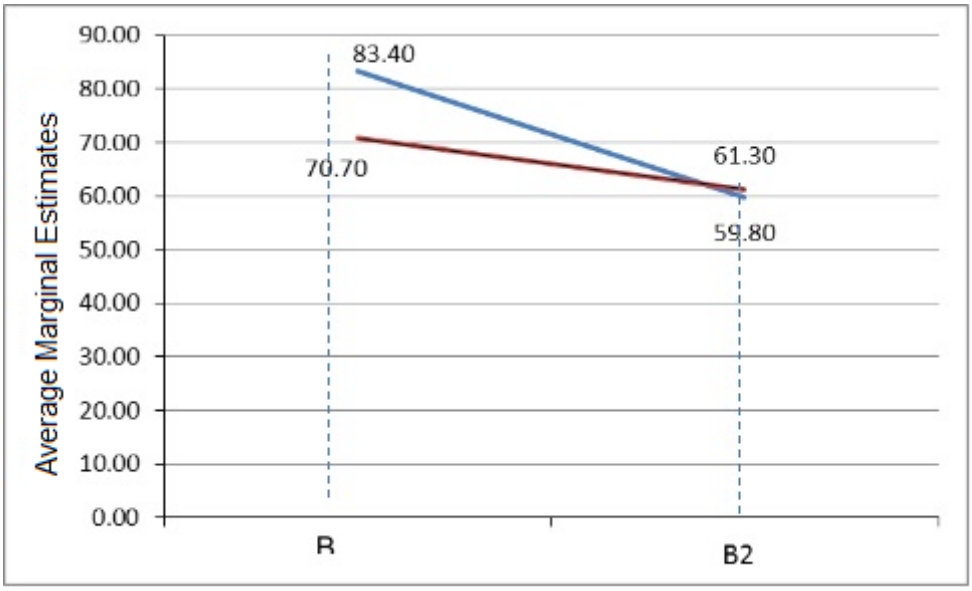

Figure 1. *The interaction between formative test type and self-directed learning.*

The intersection of the two lines shows that there is an interaction between the two variables toward the independent variable. In other words, the interaction means that the effect of the formative test type on the mathematics learning outcomes depends on the student's level of self-directed learning.

The intersection of the two lines also shows that there is an interaction between the two independent variables. In other words, the interaction means that the effect of the formative test type on mathematics learning outcomes depends on the student's level of self-directed learning.

As a consequence of the interaction, the two-line ANOVA must be continued with a Dunnett's t-test. The test was performed to examine the simple effect, that is, to examine the difference in mathematics learning outcomes between the students with high self-direction who received the formative essay test and those who received the formative multiple choice test and the difference in mathematics learning outcomes between the students with low self-direction who received the formative essay tests and those who received the formative multiple choice tests.

4) *The mathematics learning outcomes differed between the students with high levels of self-directed learning who received the formative essay tests and those who received the formative multiple choice tests.*

The results of Dunnett's *t*-test showed that the average mathematics learning outcome scores differed for the students with high levels of self-directed learning who received the formative essays and those who received the formative multiple choice tests. The t_{value} was 3.42, whereas the value for t_{table} at level α= 0.01 was 2.43; thus, $t_{value} > t_{table}$. As a result, H_0 is accepted, and H_1 is rejected, indicating that the mathematics learning outcomes differed between the highly self-directed students who received the formative essay tests and those who received the formative multiple choice tests.

The data obtained for the mathematics learning outcomes of the students with high levels of self-directed learning showed that the average scores for those who received the

formative essay tests were approximately 41.9, whereas the average scores of those who received the formative multiple choice tests were approximately 35.18, indicating that the average scores of the students who were given formative essay tests were higher than those of the students who were given formative multiple choice tests. Consequently, the learning output of the students with high levels of self-directed learning who were given formative essay tests was higher than that of the highly self-directed students who were given formative multiple choice tests. Therefore, it may be said that giving formative essay tests to these students could increase their learning results.

5) *The mathematics learning results differed between the students with low levels of self-directed learning who received the formative essay tests and those who received the formative multiple choice tests.*

The Dunnett's t-test results, which aimed to differentiate the average mathematics learning results of the students with low levels of self-directed learning who were given formative essay tests from the learning results of those who were given the formative multiple choice tests, showed that the v_{alue} was roughly - 0.138, whereas the t_{table} score at α=0.05 is -1.68. Therefore, $t_{value} > t_{table}$, and H_0 was accepted or H_1 was rejected. This result indicates that there was a difference in the mathematics learning outcomes of the students with low levels of self-directed learning who were given the formative essay tests and those who were given the formative multiple choice test.

The mathematics learning outcome data of the students with low self-directed learning showed that the average score of the students who received the formative essay tests was approximately 31.09, whereas the average score of those who received the formative multiple choice tests was 31.36. These findings indicate that the learning results of those who were given the formative essay tests were lower than the results of those who were given the formative multiple choice tests. The findings also show that the learning result for students with low levels of self-directed learning were lower when they were given formative essay tests than when they were given the formative multiple choice tests. Thus, for students with low levels of self-directed learning, formative multiple choice tests could improve their learning results.

Discussion

The results of our research and statistical analyses can be explained by noting that the variation in the mathematics learning outcomes of the students who were given the formative essay tests and those who were given the formative multiple choice tests. The mathematics learning outcome results showed that the students who took the formative essay tests scored higher than the students who took the formative multiple choice tests. This finding indicates that the type of formative test has an overall effect, regardless of whether the students have high or low levels of self-directed learning. This evidence is strengthened by similar research conducted by Munasco (2013), in which students who were given essay tests scored higher than students who were given multiple choice tests.

The research hypothesis, which stated that mathematics learning outcomes would be higher for students who were given formative essay tests than for those who were given formative multiple choice tests, was empirically examined via data analysis. The findings are explained by comparing the characteristics of both types of formative tests. As the measured learning outcomes show, the formative essay test is more effective for measuring high levels of cognitive ability, but it lacks the ability to effectively measure low levels of cognitive ability. In contrast, the formative multiple choice test is more effective for measuring low and moderate levels of cognitive ability but lacks effectiveness for measuring high levels of cognitive ability. Regarding the scope of the material, the essay test has a small scope and a small number of questions compared to the multiple choice

test. The formative multiple choice test covers a large scope of material and can represent an entire subject. However, as the factors that affected the test results show, students' scores on formative essay tests are affected by their ability to analyze, evaluate and argue their ideas on paper.

Theoretically, a formative test only needs to utilize one type of answer structure to allow students to describe, explain, compare, and reason by answering questions in their own words and by using their analytical thinking and interpretation skills to address the questions. The essay test gives students the freedom to express their ideas, which could encourage them to express an argument/opinion through their analytical writing and to express their answer directly in a way that could increase the quality of the answer and the score. This means that all students who are given essay tests can use their imagination and explore their ideas to the best of their ability. Through formative essay tests, students are motivated to develop their higher-order thinking and express it creatively.

Formative multiple choice tests provide different advantages. They are good for measuring students' abilities because they do not allow students to use their imagination. Multiple choice test results are affected by the student's ability to understand the concept, which can be viewed as a learning result. A formative multiple choice test can encourage students to remember, interpret and recall other people's ideas. Consequently, it could be said that the students who were given formative essay tests showed higher mathematics learning results than the students who were given multiple choice formative tests.

These facts support the opinion that the average mathematics learning outcome scores on formative essay tests are higher than those on formative multiple choice tests; consequently, these findings are evidence that the formative essay test treatment is more effective than the formative multiple choice test treatment for increasing student mathematics learning results. This finding is in line with the previously discussed characteristics of each formative test type. Consequently, the stated hypothesis is scientifically proven: formative essay tests improve student learning results more than formative multiple choice tests.

The second research hypothesis stated that there is an interaction effect between formative essay tests, formative multiple choice tests, and student self-directed learning on mathematics learning results, which shows the connectivity between the variables. The empirically tested data for the formative essay and multiple choice tests showed that the tests have different levels of effectiveness for measuring student learning results, depending on the student's level of self-directed learning. The data are strengthened by the research by Gavriel (2013), which stated that the effectiveness of formative assessment depends on the level of student self-directed learning. According to Oyediji and Okwilagwe (2015), self-directed learning is a process through which individuals consciously take responsibility and initiative, with or without the help of others, to determine their learning needs, formulate learning goals, identify resources for learning, select and implement learning strategies and evaluate learning outcomes within a given framework, thereby becoming their own learning agents (Costa & Kallick, 2004).

The average mathematics learning results, according to the level of student self-directed learning, were higher for the students with high levels of self-directedness who were given formative essay tests than for those who were given formative multiple choice tests. This finding shows that students who have high levels of self-directed learning can respond more effectively to formative essay tests than to multiple choice tests and that the use of essay tests could increase their learning results. However, the average score of students who had low levels of self-directed learning and received formative essay tests was lower than that of the students who were given multiple choice tests. This finding

indicates that students with low levels of self-directed learning work better with multiple choice tests and that the use of such tests could improve their learning results.

The third hypothesis is that the results for students with high levels of self-directed learning who were given formative essay tests would differ from the results for those with high levels of self-directed learning who were given formative multiple choice tests. The analytical results showed a difference in learning results between the students who were given formative essay tests and the students who were given formative multiple choice tests among the groups with high levels of self-directed learning. That is, the students with high levels of self-directed learning perform better on formative essay tests than on formative multiple choice tests. This result agrees with the opinion stated by Hapsari (2013), who said that students with high performance motivation show higher mathematics learning results on formative essay tests than on formative multiple choice tests. If self-directed learning is connected to formative essay tests, which are used for formative evaluation, then the characteristics of high self-directed learning are appropriately matched with the characteristics of essay tests; that is, the opportunity to apply individualized problem-solving skills, implement formulas and analyses, and take responsibility for one's assignments. Those characteristics indicate that the formative essay test requires critical thinking to find the answer. Thus, the formative essay test's characteristics are appropriately matched with a high level of self-directed learning, which reflects an ability to complete activities without depending on other people and having good self-confidence and initiative.

The fourth hypothesis stated that students with low levels of self-directed learning who were given formative essay tests would have lower mathematics learning outcomes compared with the students with low levels of self-directed learning who were given multiple choice tests. The data showed that the students with low levels of self-directed learning had lower scores on the formative essay tests. This occurred because these students did not have the capability to solve the problem, the self-confidence to answer it correctly, or the analytical thinking skills to arrive at an answer. This type of student tends to lack initiative in the learning process, is more likely to have a fixed approach to the subject, depends on teachers' explanations, is apprehensive about unclear ideas, and lacks the encouragement or effort to find the correct answer. Students who have low self-directed learning find it more difficult to solve problems on formative essay tests than on formative multiple choice tests. This is because students with low self-directed learning find it difficult to express their ideas, implement formulas and make decisions, which are required characteristics of the formative essay test. Embo, Driessen, Valcke and Van der Vleuten (2010) suggest that the integration of feedback and assessment through a clearly defined learning and assessment instrument is a potentially valuable method for promoting self-directed learning and formative assessment.

Conclusions

Based on the data analysis and statistical calculations, this research draws the following conclusions. First, students who were given formative essay tests and those who were given formative multiple choice tests had different mathematics learning outcomes. The students who received formative essay tests scored higher than those who received formative multiple choice tests. Second, there was an interaction effect between formative tests and self-directed learning on mathematics learning outcomes, which means that the effect of the interaction between formative tests and self-directed learning on student mathematics results in elementary school depends on the level (high or low) of self-directed learning. Third, students who had high levels of self-directed learning and were given formative essay tests had higher mathematics learning outcomes compared with those who were given formative multiple choice tests. Finally, among the students who had low levels of self-

directed learning, there was no difference in mathematics learning results between those who were given formative essay tests and those who were given formative multiple choice tests.

Implications

Based on the research findings, the direct implications for mathematics learning performance are as follows:

1) Our research findings indicate that the type of formative test used has an effect on the learning results. Thus, to improve students' learning results, teachers should use different types of formative tests in the classroom, and students should be able to complete the assignments and obtain optimal scores.
2) The research findings indicate that students' self-directed learning has an effect on the learning results. This finding implies that during the learning process, a student with a high degree of self-direction will actively participate in every learning activity in the classroom, with optimal learning results.
3) Given the appropriate materials and methods, allowing self-direction in the classroom will develop students who are active, creative, and critical and will increase students' learning motivation, which will significantly affect their mathematics learning results.

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An Investigation into Illustrations in English Course Books in a Turkish Context

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Abstract

In language classrooms all over the world, textbooks are the most dominant teaching and learning materials. In these books, illustrations occupy a prominent place in teaching and learning processes. This qualitative study aims to investigate the frequency of occurrence and functions of illustrations in English course books. Four course books (5th, 6th 7th, and 8th grades) approved by the Ministry of National Education in Turkey were analyzed. In this qualitative research, content analysis was used as the research technique. In the analysis, Levin's 1981 typology including five categories in terms of the functions of illustrations (decorational, representational, organizational, interpretational, and transformational) was employed. Based on the results, it was found that most of the illustrations in four books were subsumed under the category of representational function. The results also showed that the books were mostly lacking transformational, interpretational, and organizational illustrations. This is considered a serious drawback of the books in terms of content-related illustrations since they make abstract concepts more memorable, enhance the recall of details of texts, and facilitate students' comprehension. The study also provides recommendations for the use of illustrations in English language course books.

Keywords: English course books, Functions of illustrations, Illustrations, Material development.

Introduction

Illustrations are essential elements in any language course book. Olshansky (2008) claimed that "Pictures [Illustrations] provide a universal language. They speak equally to

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native speakers, to those learning English as a second language... Pictures are our first language. It offers a language we all intuitively understand" (Preface section, para.1). In compliance with the needs of the "visual world" of today, illustrations should be able to "serve as valuable teaching tools, bringing to the eye what otherwise can only be imagined" (Evans, Watson & Willows, 1987, p. 86). Indeed, the fact that illustrations are valuable tools for conveying one's message is not a new idea. Starting from the very old ages, humans have communicated with visual elements (Domin, 2007) irrespective of their artistic quality. Paintings helped storytellers by carrying the role of "adjunct aids" to what they narrated during the ancient times, and similar forms, namely, illustrations have become a component of print materials such as storybooks in the modern age (Carney & Levin, 2002). In addition to the storybooks, which are predominantly used with young learners, textbooks designed for students almost all levels of education starting from kindergarten to graduate levels also incorporate illustrations.

Course materials "play a key role in language education" (Basal, 2013, p.11) in teaching and learning processes. Without illustrations, "presenting learning materials merely through textual information may not lead to efficient learning demanded by the excessive amount of information" (Kuzu, Akbulut & Şahin, 2007, p.8). Moreover, "even when the text is comprehensible without a picture, pictures can support the comprehension process in many ways" (Molitor, Ballstaedt & Mandl, 1989, p.16). Çakır (2015) also claims that "in order to create a meaningful learning atmosphere and to offer *a comprehensible input*, word and pictures need to be presented simultaneously" (p.71). In a study conducted by Teele (1995) with the use of the inventory developed by the researcher based on the Multiple Intelligence Theory of Howard Gardner, all of the 26 participants of the study were visual and kinesthetic learners, showing the importance of illustrations in teaching and learning processes. When benefitted from visualization, our minds comprehend the gist fast (Laitinen, 2014). In this context, illustrations can be considered important educational and communicative tools and their frequency of occurrence and to what function these occurrences serve can give practitioners useful insight into how they best identify, classify, and modify them for their instructional purposes. To this end, this study aims to investigate the frequency with which the illustrations occur in English course books and the functions they serve.

Literature Review

Students' encounters with language in their daily lives are laden with audial and visual input (Domin, 2007). The availability of such input has facilitative effects on communication both for non-native and native speakers of a given language by enabling the speakers to fully understand the context in which the communication occurs and interpret the message accordingly. When used in course books, illustrations may thus serve a similar purpose, and the benefits of such an inclusion can be twofold: guidance for students and use of authentic sources. Hewings's (1991) definition of the term 'illustration' in a teaching material covers any input except for text such as "drawings, cartoons, photographs, flow charts, pie charts, graphs, and tables" (p. 237).

There is a parallelism between the effectiveness of illustrations used in textbooks and the overall effectiveness of the whole textbook that is made up of such illustrations and illustrations make text information concentrated, compact/concise, concrete, coherent, comprehensible, correspondent, codable, and collective (Levin & Mayer, 1993). One should not, however, equate the use of illustrations with effective teaching or learning since illustrations function only as intermediary input on their own. As Woodward (1993) suggests, illustrations do not guarantee textbook or lesson quality and student motivation all the time. The quality of illustrations as well as how they are used in relation with the text are among the several criteria which determine their effectiveness in the language

classroom. For example, according to Hewings (1991), graphs, tables, and charts are among the many graphic representations that are used in 'information transfer' activities in ESL and EFL classrooms; however, the actual form of these representations where the information is placed might sometimes be confusing for the students. In addition to the format-related difficulties, attitudes towards visual elements might have an effect on the instructional process. For example, Skorge (2008) doubts if the illustrations always work towards their ultimate capabilities by arguing that instead of promoting language instruction, the illustrations are "viewed as fulfilling design-related requirements" (p. 267).

When used in course books, illustrations can work towards fulfilling various functions. According to Levin's (1981) typology, illustration serve decorational, representational, organizational, interpretational, and transformational functions. Carney and Levin (2002) explain the five functions of illustrations as follows:

> decorational pictures simply decorate the page, bearing little or no relationship to the text content….representational pictures mirror part or all of the text content and are by far the most commonly used type of illustration…. Organizational pictures provide a useful structural framework for the text content….Interpretational pictures help to clarify difficult text….transformational pictures include systematic mnemonic (memory enhancing) components that are designed to improve a reader's recall of text information. (p. 7)

Research on the analysis of illustrations in course books has been dominated by evidence coming from analyses by researchers themselves, insights from users (e.g., students and teachers) and course book developers. Researchers used several foci in their analyses of illustrations as they appear on course books. For example, Evans et al.'s (1987) analysis of textbooks (reading, mathematics, and science) focused on the type, complexity, and location of the illustrations. Hewings (1991) analyzed the illustrations used in three elementary-level course books in five categories: representation of roles (e.g., policeman, criminal), representations of locations/situations (e.g., characters welcoming each other in a ward), representation of topographical space (e.g., rooms of a house), symbolic representations (e.g., speech bubbles, signs), and graphic representations (e.g., graphs, tables, charts).

In an analysis of 701 pictures in four British course books, Hill (2003) found that the pictures depicted actions (29,1%), portraits and interactions (24,4%), places (12 %), and objects (10,1%). A more detailed analysis of two of the course books focused on their functions, which showed that 55% of the illustrations were entirely decorative. The remaining 45% of the illustrations, however, lacked higher level language practice. Hill (2003) therefore concluded that for decorative pictures to account for more than half of the pictures in a course book might be considered as "a great waste of effort on the part of the publisher and a great waste of opportunity for the language learner and teacher" (p. 179).

In a similar study investigating a total of 2265 graphics placed in 15 business English textbooks, Romney and Bell (2012) found that only 27% of the graphics were actually used for instructional purposes while the remaining 73% of the images were used for decorative intentions. When compared with Hill's (2003) study, this study was more comprehensive in terms of the number of visual elements analyzed but found an even greater ratio of decorative uses of pictures.

It is important here to note that Hill's (2003) and Romney and Bell's (2012) analyses included only two categories, namely decorative and instructional, and the criterion used for deciding whether a graphic belonged to either one of the aforementioned categories was the existence of written instructions explaining how to use the graphics. In addition to

the binary categories given previously, some studies have focused on the different degrees of the functions of pictures. Instead of dividing pictures either as content-related or not, Woodward (1993) investigated the varying degrees of content-relatedness and found that the illustrations were used most commonly for content supporting purposes (0.75), which was followed by those which were tangentially content related (0.19), content extending (0.03), and those which were unrelated to the content (0.03).

In another study using multiple categories of functions of illustrations, Romney (2012) designed a survey that changed six of the functional categories (Levin, 1981) into a survey item (e.g., for *representation*; "Does the image make the text material more concrete?") and analyzed three frequently used ELT course books in Japan. The results of the analysis showed that representational images (47%) were the most common type of images used in the course books. Unlike most of the studies mentioned so far, decorative images (18%) ranked the third, preceded by reiterative images (23%).

Özdemir (2007) evaluated a 4th grade English course book with insight coming from students and teachers. Overall, both teachers and students were content with the pictures used in the course books. In other words, they found the pictures attractive, beautiful, and facilitating for the comprehension of the topic and exercise. As an answer to a question asking the strongest aspect of the book, all teachers (N=15) reported that the variety of colors, pictures, and drawings in the course book were among the strengths of the book. One teacher recommended the use of real pictures instead of drawings in the course book to make the visual components more effective.

Most researchers point to the marketing strategies behind the highly non-functional use of illustrations in course books. According to Hill (2003), the prevalence of decorative visuals in ELT course books might indicate that course book developers and publishers prefer the use of charming pictures to cover unoccupied spaces in the course books over activity-related pictures. According to Woodward (1993), the fact that textbooks are supposed to be in line with what the market agrees upon is problematic. Evans et al. (1987) conducted interviews with personnel from varying job positions (e.g., program manager, editor, art director) of nine major educational publishing houses. The interviewees stated that as an effort to address the market demands, illustrations in the new editions of the books were "more visually appealing", "more lively", "more varied", "more colorful", and "more frequent" (p. 89). Assuming that text attractiveness is one aspect that teachers value in their first encounters with a course book, and thereby has an effect on their decisions about whether they are going to use them in their lessons, publishers use pictures abundantly to make course books more charming (Romney, 2012). In effect, the presence of illustrations in a particular textbook is always an important criterion which is also placed in textbook evaluation rubrics (Woodward, 1993).

Hewings's (1991) study showed how illustrations used in elementary-level course books might be perceived differently by students from different cultural backgrounds. Contrasting findings were uncovered in other studies. For example, in a study investigating whether learners from differing cultural backgrounds diverged in their perceptions of what cartoon-style illustrations depicted, Skorge (2008) found that the learners were not too different from each other in their recounts of the illustrations.

All of the above findings suggest that the strong emphasis on the "visual properties of the visuals" might be one of the main obstacles which prevent authorities from giving due importance for the instructional functions of these illustrations. After all the marketing processes (i.e., stages beginning with the development of the course book and ending with the actual users buying them), it is the teachers who seek ways to go beyond the "first

impressions" given by the illustrations so that their students actually benefit from the presence of these illustrations and facilitate the language learning process.

The motivation behind the use of illustrations, nonlinguistic cues, can be instructional as well as decorative. It is the aim of this paper to investigate the instructional and other uses of illustrations as found in four different grade level ELT course books used in Turkish schools. The following research questions guided the current study:

1. How frequently are illustrations used in 5th, 6th, 7th, and 8th grade English course books?
2. How is the distribution of illustrations for each grade level in terms of their functions?

Method

This study aims to investigate the frequencies and functions of illustrations used in four English course books. To this end, qualitative research design was adopted since it allows to interpretation of the illustrations used in the course books analyzed. Content analysis technique was employed to examine the illustrations in the selected course books. Content analysis is "a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use" (Krippendorff, 2004, p. 18) and uses "a set of procedures to make valid inferences from text" (Weber, 1990, p. 9). In this study, the analysis of the course books in terms of illustrations was limited to the visual content included in these books. The analysis was based on reviewed typology of Levin (1981) including five functions of illustrations as decorational, representational, organizational, interpretational, and transformational. The reason for using Levin's typology of illustrations was that it is relatively easy to categorize the illustrations and it is also one of the most common tools in the literature for investigating the illustrations in the course books.

Materials

Four English course books (5th, 6th, 7th, and 8th grade) approved by the Ministry of National Education (MoNE) for classroom use in Turkey were investigated in terms of the frequencies of illustrations and their functions. The central rationale for the selection of the books in question was that they are used as the English course books in secondary schools in Turkey at the time of the study. These books were:

-5th Grade, Ortaokul English 5, Yıldırım Yayınları. , (approved by Turkish Education Board in 2013 and stated to be used as a textbook since 2013-2014 academic year)

-6th Grade, Ortaokul İngilizce 6, Evrensel İletişim Yayınları, (approved by Turkish Education Board in 2014 and started to be used as a textbook since 2014-2015 academic year)

-7th Grade, Ortaokul Sunshine 7, (Lider Yayınları., approved by Turkish Education Board in 2014 and started to be used as a textbook since 2014-2015 academic year)

-8th Grade, İlköğretim Unique 8, Atlantik Yayınları, (approved by Turkish Education Board in 2012 and started to be used as a textbook since 2013-2014 academic year)

Data Analysis

Data were acquired from scanning the course books to answer the research questions of the study. Four researchers separately determined the illustrations (pictures) and their functions according to Levin's 1981 typology of functions of illustrations (decorational, representational, organizational, interpretational and transformational). Then the researchers came together to compare their findings related to the types of illustrations in

the books. They agreed on the functions of 855 illustrations and disagreed on 175 illustrations from a total of 1030 illustrations (See Appendix A for examples of illustrations from the current study and their functions). The reliability between the researchers in terms of the functions of the illustrations was with calculated with the formula [agreement / (disagreement + agreement)] *100 (Miles & Huberman, 1994) and was found as 83%, a high reliability. Despite the high reliability, the researchers refined their findings through discussion.

Results

In line with the purpose of this research, findings are presented in terms of two research questions. For the first research question, the frequencies of illustrations that were found in the course books can be seen in Table 1. According to Table 1, all course books include illustrations with varying frequencies. A systematic increase in the number of illustrations can be seen depending on the increase across grade levels, except the third grade. This was a striking finding since the researchers expected to see more illustrations in the lower grades. As is known, the textual density increases as the grade increases. In this respect, a greater number of illustrations was expected for lower grade level course books. The number of illustrations is the highest in the 8th grade (*n*=301) and lowest in the 6th grade (*n*= 217). When the total number of illustrations in four English course books (*n*=1030) is considered, a nearly equal distribution can be seen except the 8th grade. This finding does not provide insights about the purposeful use of illustrations in these books by the developers of the books in question.

Table 1. *Number of illustrations in the course books*

Grade level	Number of illustrations
5th grade	247 (23.9%)
6th grade	217 (21%)
7th grade	265 (25.7%)
8th grade	301 (29.2%)
Total	1030 (100%)

For the second research question, distribution of illustrations in the course books in terms of their functions can be seen in Table 2. According to Table 2, all course books include illustrations in varying numbers, exhibiting a variety functions. As understood from the table, all four course books include illustrations having functions as decorational, representational, and interpretational. From these three functions, representational function has the highest frequency whereas interpretational the lowest. The researchers think that the developers of the books purposefully used more illustrations having representational function in order for students to make a close connection between the text and the picture, allowing the learners to comprehend the information in the text better.

Table 2. *Functions of illustrations per grade level*

Function	Grade level				Total
	5th grade	6th grade	7th grade	8th grade	
decorational	28 (11.3%)	13 (5.9%)	10 (3.7%)	33 (10.9%)	84
representational	214 (86.6%)	197 (90.7%)	212 (80%)	240 (79.7%)	863
organizational	4 (1.6%)	-	8 (3%)	-	12
interpretational	1 (0.4%)	1 (0.4%)	29 (10.9%)	15 (4.9%)	46
transformational	-	6 (2.7%)	6 (2.2%)	13 (4.3%)	25

The use of decorational illustrations was lower than the representational ones and it is considered that such an approach is beneficial since decorational illustrations serve no more than increasing the attractiveness of the text with little information about the content. Actually, placing decorative illustrations in course books with no explicit aims may distort the comprehensibility of the text and even distract the students. The illustrations having organizational function, making the context information more integrated and transformational function, making the text information more memorable (Levin, 1981) had the lowest frequency in the books. The reason for low percentages can be associated with the difficulty in finding illustrations serving for these purposes. In addition, it is thought that finding these kinds of illustrations can be time consuming for the book developers, forcing them to neglect illustrations serving for these functions.

A striking finding based on the analysis is that illustration functions such as organizational, interpretational, and transformational can hardly be seen particularly in the 5th and 6th grade English course books. It was concluded that this finding may be the result of the relationship between these functions of illustrations and higher order thinking skills. Learners should use higher order thinking skills when they see such illustrations. In 5th and 6th grades, it may be more difficult for learners to use these skills when compared to 7th and 8th graders.

Discussion and Conclusion

The current study aimed to investigate the frequencies and functions of illustrations based on the categorization by Levin (1981) in four English course books used for teaching English in Turkey. Based on the findings, all course books included illustrations in varying frequencies. The distribution of the numbers of illustrations showed a systematic increase as the level of the course books increased, which was an unexpected finding for the researchers. It was expected to find more illustrations as the grade level decreased because using more illustrations in the course books is a more viable option in lower grades due to the decrease in the textual density of their books when compared to higher levels.

In terms of their functions, representational illustrations (n=863) were the most common in all four grades which is consistent with the findings of the study conducted by Romney (2012) on the course books used in Japan. Decorative illustrations, increasing the attractiveness of the text without adding information to text, were second (n=84) to the representational ones. In line with our findings, Mayer (1993) also found that the majority of illustrations in science textbooks were either decorational or representational. In the studies they conducted, Hill (2003) and Romney and Bell (2012) found that decorative illustrations were dominant in the course books they analyzed, which is contrary to the findings of the current study. Laitinen (2014) also found that illustrations in the eight

English course books analyzed were mainly used as decorative elements. However, it is still problematic to find a high number of decorative illustrations in this study. The explanation for the higher number of illustrations in the course books analyzed in this study can be related with the aim of attracting the book users. According to Evans et al. (1987) such an approach may be the result of publisher concerns to present the books in a more attractive and appealing format. Hill (2003) also claimed that course book developers and publishers have a preference for using decorative pictures rather than the content related ones to make the books visually more attractive. Using decorative pictures only to occupy space in the books is problematic and mostly related with affecting the teachers' preference for using their books (Woodward, 1993). The researchers of the current study also argue that using decorative pictures frequently to occupy space in the books and to make the books visually attractive may result in problems with the comprehensibility of information presented in the books since it may distract the students' attention away from the main purpose. Decorative pictures may be considered as unsuitable for the instructional purposes and have no educational value because they "include only little learning-relevant information, they cannot contribute much to mental model construction directly" (Lenzner, Schnotz & Mülle, 2013, p. 827). In other words, the use of illustrations having decorative function in English course books does not engage students mentally.

Illustrations in the English course books should be attractive and charming for the students. However, charm and attractiveness of the illustrations should be closely linked with the instructional purposes because the important thing is the "didactic function [of illustrations] which either supports or hinders them. Hence, the design of a picture should be considered in connection with the functional perspective" (Molitor, Ballstaedt & Mandl, 1989, p. 28). In a study on the 4th grade English course book (Özdemir, 2007), all the teachers that participated in the study stated the pictures, drawings, and colors in the book were the strongest aspect of the book. However, there is no information about the functions of the illustrations in the book. In this context, we can claim that the teachers' statements regarding the illustrations can be deceptive since "teachers and administrators equate attractive layout and stunning photographs with instructional quality. Unfortunately, *there is no necessary connection between bountiful and attractive illustrations and learning* [emphasis added]" (Woodward, 1993, p. 132).

The results of the current study indicated some important insights for the use of illustrations in the English course books of the future. It is clear that using decorative illustrations more than the content-related ones is a more pragmatic approach if illustrations are aimed to be used for instructional purposes and engagement of students mentally. In the books analyzed, it is considered that decorative illustrations is only second to the representational ones in all levels for the marketing purposes. The publishers prefer to use decorative illustrations to sell more books by attracting teachers. This means that there is a weak connection between the publishers and the researchers in the design and development process of course books. This connection should be strengthened in order for course books to include more illustrations serving the instructional purposes. With regard to the effects of illustrations, among the functions of illustrations, interpretational and transformational ones are more effective in terms of learning and representational and organizational ones are more effective than the decorative ones (Levin, Anglin, & Carney, 1987). Therefore, it can be concluded that English course books should include less decorative illustrations and more other illustration types to enrich the learning of students from the texts.

Illustrations may also mean different things for different students because interpretation of illustrations is open to cultural bias and students might not be able to

interpret their intended use and meaning. Teachers should therefore foster the skills necessary for their students to be able interpret them (Evans et al., 1987; Hewings, 1991). In conclusion, every illustration in the books should be selected carefully to increase their benefits in terms of enhancing the learning of the students and course book designers should not ignore the fact that a random selection of illustrations may possibly reduce the intended beneficial effect of illustrations for text comprehension. In other words, the positive effects of illustrations used in English course books on learning can be augmented with the use of carefully selected illustrations. Murakami and Bryce (2009) states that "when images or figures match the verbal input, they are encoded by both the verbal and non-verbal systems, thus promoting memory more strongly than in the case of verbal or visual input alone" (p.50), which can be valid for the match between the information in the text and illustrations supporting it. The use of illustrations may also help the learners to grasp the information presented in the text when the learners "face formidable barriers in a written text without any accompanying visual context" (Chun 2009, p. 146). In addition, limitation of decorative illustrations which are used mainly for increasing the sales of the books with no proved benefits on learning and using carefully selected illustrations accompanying texts may increase the positive effects of illustrations on learning. As Alley (1994) suggested "the success of future textbooks… hinges, at least partially, on the quality and application of their illustrations" (p. 494). In this context, the illustrations in course books should not be considered as *ornaments* but tools to enhance learners' comprehension of information in the text.

This study was limited to the investigation of illustrations and their functions in four English course books. The other course books in the market used for English language teaching may be investigated for comparison purposes. Future studies may also include views of the students and teachers since they are the *real players* who can show whether illustrations are helpful in elaborating the content in the books.

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APPENDIX – A: Examples of illustrations from the current study and their functions

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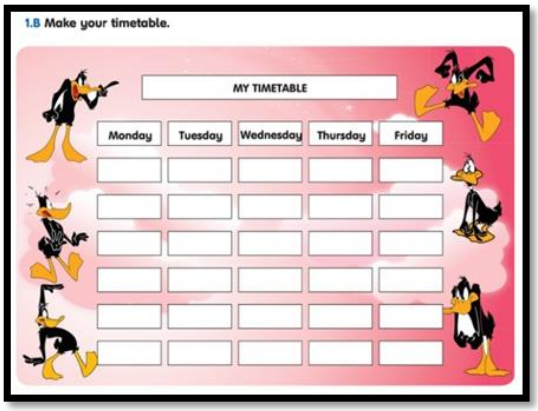
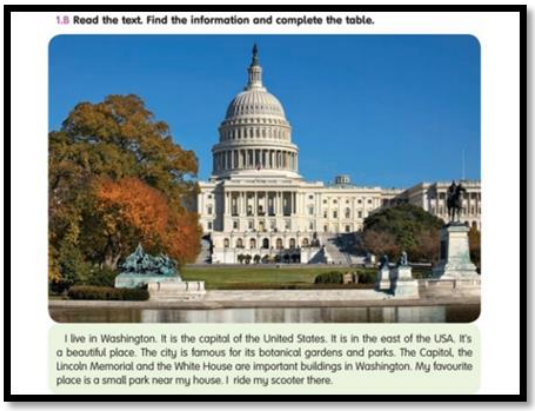
<tr><td> 
</td><td> 
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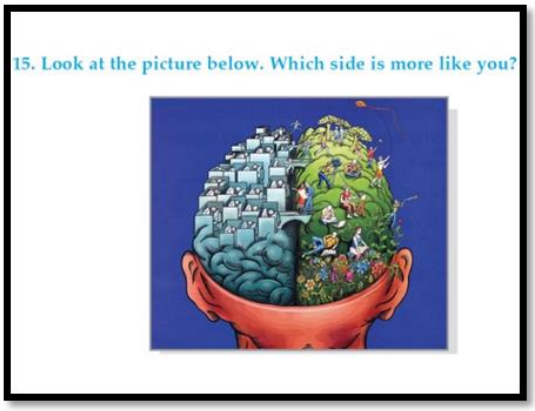
</td><td> 
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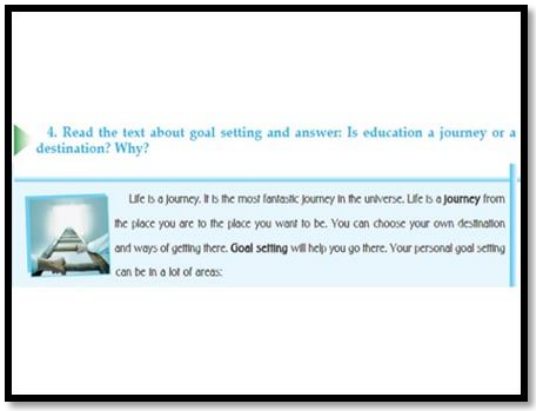
<tr><td> 
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