

“Recycling” Concept Perceptions of Grade Eighth Students: A Phenomenographic Analysis

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ABSTRACT The aim of this study was to determine eighth grade students' perceptions of recycling. The phenomenographic research method was used to solicit students' views about recycling. The study was carried out with 595 eighth grade students in the 2011-2012 academic year in the city of Nigde. Research data were obtained from students via their complete sentences. In the data analysis, six different classifications of recycling were determined. The phenomenographic analyses results have yielded the following distinct definition categories. Results indicated that students considered recycling is protection of the environment, recycling is protection of nature, recycling is protection of natural resources, recycling is valuation of waste, recycling is retransformation of waste, recycling is waste recovery, recycling is transformation of waste for new reuse, recycling is cost savings. These findings were interpreted and discussed in the paper.

INTRODUCTION

While once a balance had existed between nature and humanity, man's eagerness to exploit further has altered the functioning of natural system. Environmental problems arise due to interventions and activities of humanity. These problems are known to have accumulated and reached its current levels. Although humanity was initially not too aware of environmental problems, widespread contagious epidemics and famines, nutritional requirements of populations, reductions in availability of raw materials have triggered man to pay attention to environmental and ecological problems (Akbasli and Meydan 2010; Cimen and Yilmaz 2012).

Today a multiplicity of environmental problems are encountered. Global warming, climate change, ozone layer damage, destruction of forests, fresh water pollution, desertification, waste disposal, air pollution, soil erosion, soil pollution, famine and starvation, destruction of species, solid waste and recycling are some of the most important problems we are confronted with (Ahmad et al. 2012; Cimen and Yilmaz 2012; Ileri 1998; Sahin 2013; Yilmaz and Gultekin 2012).

One of the pressing environmental concerns is the solid waste which manifests itself through social, residential and industrial activities. These are waste products which must be disposed without harming nature or the people (Akbasli and Meydan 2010; Malandrakis 2008). Increased world population, consumer economics and advances in industrial output have widened the

spectrum of solid waste types and increased quantities. Solid waste has the capacity to remain in nature for extended periods, cause severe environmental damage and affect human health negatively (Aydin and Kara 2003; Kayranli et al. 2003; Wright 2012). For example, certain plastics remain in tact for many years and cause pollution in earth and water (Ozturk 2004).

Recycling and reuse is the most important method of reducing waste produced and minimization of resource use (Budak and Oguz 2008). Certain types of waste formed during and after production can be recovered and reutilized as quality raw material or reusable auxiliary products perhaps even in energy production (Meric and Kayranli 2003). Recycling is reinclusion of the disposed waste to the economic production. An important portion of solid wastes (paper, plastic, metals, glass, etc.) are recyclable products (Cimen and Yilmaz 2012; Meneses 2006; Ozturk 2004; Zulas 2009).

Recycling of waste products and reuse have direct or indirect positive rehabilitative effects on human health, the environment, natural resource use, prevention of ground water pollution, reduction of CO₂ emissions, and improvement of the global economies (Ackerman 2005; Akcayhan 2008; Kayalak 2007; Spiegelman and Sheehan 2004; Yilmaz 2010).

Recycling and other environmental protection behaviour in the World is gaining higher significance in alleviation of environmental problems (Aba 2010; Sahin 2013; Schultz 2002). Increased environmental protection awareness will

contribute very extensively to the resolution of problems and this is only possible through environmental education. Today, environmental education has gone beyond informing people of the environment and established among its goals to make people voluntary, enthusiastic and skilled participants in the management of environment.

Schools are vital in the development of environmental protection behaviour. Students can easily acquire an environmental consciousness and learn the recycling process benefits at the schools. Connor (1989) has emphasized the highly important role of schools in developing the recycling perception among students. Students should learn that the planet has finite resources, certain waste products remain a very long time unaltered in nature and of the serious harm this causes (Cimen and Yilmaz 2012; Yilmaz and Gültekin 2012).

Public should be further informed about solid wastes and recycling, particularly at primary schools with more effective environmental curriculum. In this respect, more weight should be attached to the application oriented subjects of solid wastes and recovery. Municipal administrations should expand their recycling programs and encourage related efforts (Ceylan 2010).

Raising environmental consciousness should commence at our preschools and continue at appropriate levels until the end of university education. In view of the information above it is self-evident that environmental as well as natural resources long term sustainability is impacted very positively by the recycling of solid wastes, however, no previous formal study done in Turkey concerning the perception of recycling concept by eighth grade students has been encountered.

Objectives

The goal of this study is to investigate through phenomenographic research pattern how 8th grade students at the city of Nigde perceive the concept of recycling, and to identify definition categories obtained by these differing perceptions.

METHODOLOGY

This study utilizes phenomenography, a qualitative research method which has been accepted as a new approach in education research since

the 1980s (Akerlind 2005). This method enables determination of what different individuals understand or perceive from the same concept (Didis et al. 2008). Humans widely use phenomenology inadvertently to define their ways of perceiving life (Cekmez et al. 2012; Larkin et al. 2006). It also focuses on phenomena which we are aware of but do not have a deep and detailed comprehension. The purpose of phenomenographic research is to identify different paths for humans to experience a certain aspect of a phenomenon or reality for interpretation, comprehension or conceptualization. In this way, different understandings of a specific phenomenon are revealed and these understandings are classified according to categorized concepts (Cepni 2012).

This method uses qualitative data collection methods such as observation, individualized or group interviews and document analyses (Mar-ton 1994). Conceptual or event oriented perceptions of the research subjects are revealed realistically and as a whole in a neutral environment (Yildirim and Simsek 2006). As of this writing, phenomenography does not possess a standardized data analysis approach. All data must be reviewed repeatedly from naming to classification to permit the researcher to identify the similarities or differences in the responses of study participants and to begin formulation of categorization. First the pioneer categories are formulated and with latter reviews either new definition categories are formed or the existing ones are modified. This process continues until all data conforms to formulated categories (Didis et al. 2008). Thus, the categories eventually reveal how unique individuals perceive and experience the concepts. Definition categories represent the fundamental meanings of concepts which reveal the similarities or contradictions in understanding, and depict the main structural framework of how a phenomenon may be defined qualitatively in different ways, analyzed and perceived (McCosker et al. 2003).

Study Group

The participants in this study were 595 eighth grade students from the 2011-2012 education year of 12 primary schools in the city of Nigde in central Anatolia. Of these 8th Grade participants 322(54.12%) were girls and 273(45.88%) were boys. The majority of students were 14 years old. Nearly 28% of the students belonged to famil-

lies with higher socio-economic level, while 58% were at medium socio-economic level and the remaining 14% were with lower means.

Data Collection and Assessment

A survey form with short and open-ended questions inquiring how students perceived the recycling concept was provided to the participants and they were required to respond. This survey form contained expressions of “I think the recycling concept means.....”, “For me, recycling means.....”. Additionally, the form contained one question intended to identify the gender of the participant. Students were given 20 minutes to complete the form. The definitions expressed by students in their own handwritten responses construed the primary data of study. The collected data were evaluated through the phenomenographic analysis method (expression content analysis technique). In this analysis, all responses concerning the recycling concept were initially reviewed quickly and later the same responses were read a second and third time. After third reading, the temporary pioneer categories were determined in their main lines. These pioneers were taken as basis for later readings, in other words they were tested against the responses of participants. Further readings were used to validate the categories and similar responses were placed in the same category. Subsequent to this process of phenomenographical

analyses certain definition categories were obtained. In cases where a student response may be included in two or more categories, the category with highest hierarchy was chosen.

RESULTS

When the recycling definitions of the eighth grade students were examined according to the above mentioned method, six different qualitative recycling definition categories were identified.

“Definition categories”, “Student expressions” and “Frequency and percentages of girls and boys in each category” are given below.

Definition Category 1: Recycling is Protection of Environment

A total of 94 eighth graders provided this definition. Students defined recycling in general terms, as “protection of environment”. This category was divided to two subcategories. These are 1.1: Protection of Nature, and 1.2: Protection of Natural Resources. Expressions of subcategories are given in Tables 1 and 2.

As can be seen in Table 1, of the eighth grade study participants, 9.24% (55 students) defined recycling as “protection of nature”.

As seen in Table 2, 6.56% (39 students) of eighth grade participants defined recycling as “Protection of Natural Resources. As seen in Tables 1 and 2, nearly 15.8% (94 students) of

Table 1: Definition category 1.1 expressions

Definition category 1.1	Expressions	Number of student			
		Female	Male	Total	Percentage
Recycling is Protection of Nature	Protection of nature by removal of waste from the environment	19	13	32	5.38
	Protection of nature by forwarding waste such as paper, glass, plastic and metal to recycling	12	11	23	3.86
	Total	31	24	55	9.24

Table 2: Definition category 1.2 expressions

Definition category 1.2	Expressions	Number of student			
		Female	Male	Total	Percentage
Recycling is Protection of Nature Resources	Protection of natural resources as a result of waste recycling	15	8	23	3.87
	Protection of natural resources by recycling of waste harmful to environment	6	10	16	2.69
	Total	21	18	39	6.56

eighth grade students expressed recycling in general terms as “protection of environment”.

Definition Category 2: Recycling is Valuation of Wastes

This definition was given by 71 eighth grade students. In this category the students expressed recycling as valuation of waste products. Expressions in this category are given in Table 3.

As seen in Table 3, 11.93% (71 students) of eighth grade participants defined recycling as valuation of waste products.

Definition Category 3: Recycling is Retransformation of Waste

This definition was given by 139 (23.36%) eighth grade students. In this category students expressed recycling as retransformation of waste. Expressions in this category are given in Table 4.

As seen in Table 4, 23.36% (139 students) of eighth grade participants expressed recycling as “transformation of waste products”.

Definition Category 4: Recycling is Recovery of Waste

This definition was given by 123 (20.67%) eighth grade students. In this category students expressed recycling as beneficial recovery of waste. Expressions in this category are given in Table 5.

As seen in Table 5, 20.67% (123 students) of eighth grade participants expressed recycling as recovery and regaining of wastes.

Definition Category 5: Recycling is Transformation of Waste for New Reuse

This definition was given by 108 (18.15%) eighth grade students. In this category students expressed recycling as transformation of waste for new reuse. Expressions in this category are given in Table 6.

As seen in Table 6, 18.15% (108 students) of eighth grade participants expressed recycling as “transformation of wastes for reuse”.

Table 3: Definition category 2 expressions

Definition category 2	Expressions	Number of student			
		Female	Male	Total	Percentage
Recycling is Valuation of Wastes	Valuation of wastes	8	10	18	3.02
	Valuation of wastes such as metals, papers, bottles by depositing them in recycling container	18	13	31	5.21
	Collection of some waste from homes and businesses for reuse in industry	13	9	22	3.70
	Total	39	32	71	11.93

Table 4: Definition category 3 expressions

Definition category 3	Expressions	Number of student			
		Female	Male	Total	Percentage
Recycling is Retransformation of Waste	Transformation of wastes such as paper, glass and plastic for new use	25	19	44	7.39
	Collection of used waste materials and retransformation in factory for reuse	21	16	37	6.22
	Collection of waste paper, glass, plastic materials for recycling and their transformation into various goods and materials	12	13	25	4.20
	Depositing of paper, plastic, glass, etc. goods into waste containers and their recycling	18	15	33	5.55
	Total	76	63	139	23.36

Table 5: Definition category 4 expressions

Definition category 4	Expressions	Number of student			
		Female	Male	Total	Percentage
Recycling is Valuation of Wastes	Beneficial regaining(reincorporation) of waste recovered to the environment	9	11	20	3.36
	Reincorporation of wastes such as paper, glass, plastic to the environment	15	12	27	4.54
	Reincorporation of wastes such as paper, glass, plastic to nature by recycling	12	11	23	3.86
	Reincorporation of recyclable waste into nature	11	10	21	3.53
	Reuse of used goods	8	7	15	2.52
	Recycling of glass, paper, plastic and gaining for reuse	8	9	17	2.86
	Total	63	60	123	20.67

Table 6: Definition category 5 expressions

Definition category 5	Expressions	Number of student			
		Female	Male	Total	Percentage
Recycling is Transformation of Waste for New Reuse	Collection of recyclable wastes and their transformation in factories for reuse	13	10	23	3.87
	Forwarding of wastes such as paper, glass, plastic and metal to recycling for transformation into reuse	17	12	29	4.87
	Reprocessing of used papers, batteries and glasses for reuse	12	9	21	3.53
	For prevention of pollution, reprocessing of wastes for reuse	8	10	18	3.02
	Recycling of some wastes for reuse without harm to nature	10	7	17	2.86
	Total	60	48	108	18.15

Definition Category 6: Recycling is Savings

This definition was given by 43 (7.23%) eighth grade students. In this category students expressed recycling as savings. Expressions in this category are given in Table 7.

As seen in Table 7, 7.23% (43 students) defined recycling as “obtaining savings”.

DISCUSSION

The purpose of the current study was to investigate 8th grade students’ perceive on the

concept of recycling. The study findings demonstrate that eighth grade students’ recycling concepts do not involve a full definition. One reason for this, although there exists no environmental education course in pre-school, primary school and high school curricula, sensitization development subjects in other courses had been attempted (Akçay 2006). Numbers of direct environmental lessons within the curricula may be insufficient. Due to this reason, it was concluded that students do not have adequate awareness and sensitivity in environmental issues and recycling. The findings of Karatekin

Table 7: Definition category 6 expressions

Definition category 6	Expressions	Number of student			
		Female	Male	Total	Percentage
Recycling is Savings	Obtaining savings by collection of waste thrown into environment	9	10	19	3.19
	Obtaining raw material savings by reuse of waste thrown into environment	13	11	24	4.04
	Total	22	21	43	7.23

(2013) support this conclusion. Karatekin (2013) reached a result indicating that social studies teacher candidates had very low level of awareness of solid waste and recycling subjects.

As an environmental protection behaviour the recycling concept currently not deeply spread in Turkey may be shown as another reason (Tekkaya et al. 2011). The findings of the study by Tekkaya et al. (2011) support this view.

When the science and technology text book is examined it can be seen that information on the subject of recycling is extremely limited. Consequently the concept of recycling is not learned adequately and this suggests a more comprehensive coverage of the subject in the curriculum. Findings of the study done by Avan (2011) is supportive of this view. Recycling and other environmental issues are discussed in various lessons but text book exercises are not at a level to provide significant gains. Text book subjects are inappropriate for formative approach and in most part they are simply in the text format. This may be contributing to inadequate development of environmental consciousness. Possibly resulting in desensitization.

CONCLUSION

The findings obtained from this study revealed six different qualitative recycling definition categories. According to these qualitative definition categories, the definitions provided by the 8th Grade students do not fully meet the recycling concept. One reason for this, although there exists no environmental education course in pre-school, primary school and high school curricula, sensitization development subjects in other courses had been attempted. Numbers of direct environmental lessons within the curricula may be insufficient. Due to this reason, it was concluded that students do not have adequate awareness and sensitivity in environmental issues and recycling.

RECOMMENDATIONS

Considering the results of the current study, the following suggestions can be put forward:

- ♦ Recycling perceptions of primary school students across various regions of Turkey can be examined by phenomenographic research method. The results may be correlated and compared.

- ♦ In addition to theoretical recycling information given at schools, the students may be engaged individually in organized practical experiential approaches.
- ♦ For further development of environmental consciousness and raised recycling appreciation, educational animation programs may be used through mass media.
- ♦ In schools creative dramatic methods may be used by teachers during the lessons concerning the environment and recycling.
- ♦ Environmental education and the subject of recycling should be dealt at all levels of education and be public oriented.

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