

**THE EFFECTS OF THE DESIGN AND ORGANIZATION OF
LEARNING ENVIRONMENTS ON CREATIVITY:
THE CASE OF TWO SIXTH GRADE ART-ROOMS**

**A THESIS
SUBMITTED TO THE DEPARTMENT OF
INTERIOR ARCHITECTURE AND ENVIRONMENTAL DESIGN
AND THE INSTITUTE OF FINE ARTS
OF BİLKENT UNIVERSITY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF FINE ARTS**

By

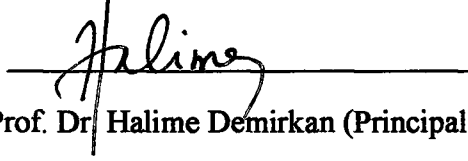
Deniz Hasırcı

May, 2000

T 94946

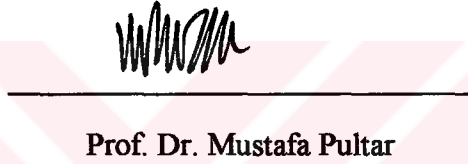
**T.C. YÜKSEKÖĞRETİM KURULU
DOKÜMANTASYON MERKEZİ**

I certify that I have read this thesis and that in my opinion it is fully adequate, in scope and in quality, as a thesis for the degree of master of Fine Arts.



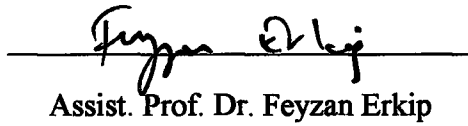
Assist. Prof. Dr. Halime Demirkan (Principal Advisor)

I certify that I have read this thesis and that in my opinion it is fully adequate, in scope and in quality, as a thesis for the degree of master of Fine Arts.



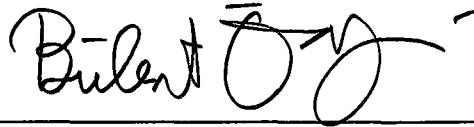
Prof. Dr. Mustafa Pultar

I certify that I have read this thesis and that in my opinion it is fully adequate, in scope and in quality, as a thesis for the degree of master of Fine Arts.



Assist. Prof. Dr. Feyzan Erkip

Approved by the Institute of Fine Arts.



Prof. Dr. Bülent Özgüç, Director of the Institute of Fine Arts

ABSTRACT

THE EFFECTS OF THE DESIGN AND ORGANIZATION OF LEARNING ENVIRONMENTS ON CREATIVITY: THE CASE OF TWO SIXTH GRADE ART-ROOMS

Deniz Hasırcı

M.F.A. in Interior Architecture and Environmental Design

Supervisor: Assist. Prof. Halime Demirkan

May, 2000

This study analyzes the effects of the design and organization of learning environments on creativity. Two types of organizations -flexibility and grouping- inside the learning environment are influential on students' creativity, and this study aims to find which organization has more impact and in what ways. Furthermore, it dwells upon the physical characteristics that provoke students' interest and motivation, and that provide the ground for creativity to flourish on, in a learning environment. The four elements of creativity - the *person*, *process*, *product*, and *environment*- come together to clearly and completely define creativity; these four elements form the structure of the research. Two sixth grade art-rooms have been chosen as the setting, one organized according to the idea of flexibility, and the other on grouping. Art-rooms have been chosen because creativity can be more readily observed in art compared to other fields, and this age group has been chosen as children in this age group are at the peak point of creativity. After this age, creativity either stays at the same level or starts to diminish with the effects of social rules and regulations, thus, results would be more informative. Questionnaires for the students and teachers; observations of each child, her/his creative process, product, and the characteristics of the art-room; and a 1/20 model of the desired art-room made by each student, were assessed in order to be able to form a complete picture of creativity in each art-room. The main objective of the research was to obtain results that would define which characteristics -physical and social- enhance creativity in a learning environment. These characteristics are analyzed, the two schools are compared, and further research is proposed according to the findings.

Keywords: Creativity, Learning Environments, Flexibility, Grouping, Spatial Characteristics

ÖZET

ÖĞRENİM MEKANLARININ TASARIM VE ORGANİZASYONUNUN

YARATICILIK ÜZERİNDEKİ ETKİSİ:

İKİ ALTINCI SINIF SANAT ATÖLYESİ KARŞILAŞTIRMASI

Deniz Hasırcı

İç Mimarlık ve Çevre Tasarımı Bölümü

Yüksek Lisans

Tez Yöneticisi: Y. Doç. Dr. Halime Demirkan

Mayıs, 2000

Bu çalışmada öğrenim mekanının tasarım ve organizasyonunun yaratıcılık üzerindeki etkisi araştırılmaktadır. *Esneklik* ve *gruplama* ile belirlenen mekan organizasyonlarının yaratıcılık üzerindeki etkisi, ve bu etkinin nasıl ve ne yönde olduğu irdelenmektedir. Ayrıca, öğrencilerin ilgisini çeken, motive eden, ve yaratıcılığın gelişmesini destekleyen mekansal özellikler üzerinde durulmaktadır. Yaratıcılığın kapsamlı bir şekilde tanımlanması için dört tanımlayıcı elemana -kişi, süreç, ürün, ve çevre- gereksinim duyulmaktadır. Bu dört eleman araştırmanın çatısını oluşturmaktadır. Araştırma iki adet altıncı sınıf sanat atölyesinde yapılmıştır. Bunun nedeni sınıflardan birinin esneklik, diğerinin gruplamaya göre düzenlenmiş olması ve farkların gözlemlenebilmesidir. Yaratıcılığın sanatta diğer alanlara daha iyi gözlemlenebilmesinden dolayı sanat atölyeleri seçilmiştir. Ayrıca, bu yaş grubundaki çocuklar yaratıcılıklarının zirvesinde olup bu yaştan sonra, öğrenilen sosyal kurallardan dolayı yaratıcılıkları, ya aynı seviyede kalmakta, veya azalmaktadır. Her iki atölyede de yaratıcılığın kapsamlı şekilde değerlendirilebilmesi için, öğrenci ve öğretmenler ile mülakatlar yapıp, her öğrencinin, yaratıcılık sürecinin, ürününün, ve de atölyenin gözlemlenmesi yapılmıştır. Ayrıca, her öğrenci tarafından tasarlanan, ve atölyenin 1/20 ölçekteki düzenlenmesinin maketi değerlendirilmiştir. Araştırma, bir öğrenim mekanında yaratıcılığı destekleyen mekansal ve sosyal özellikleri analiz etmektedir. fiziksel ve sosyal hangi özelliklerin yaratıcılığı desteklediğini analiz etmektir. Bu özellikler incelenmiş, iki okulda elde edilen bulgular karşılaştırılmıştır, ve ileriye dönük araştırma için önerilerde bulunulmuştur.

Anahtar Kelimeler: Yaratıcılık, Öğrenim Mekanı, Esneklik, Gruplama, Mekansal Özellikler

ACKNOWLEDGEMENTS

I would like to thank, first of all, Assist. Prof. Halime Demirkan for her great patience, and guidance throughout this study.

I would like to thank art teachers, Yeřim ifter from Erken Bařarı Elementary School and Tmay Krugman from Bilkent University Preparatory School, and the 24 brilliant students in both schools for their invaluable help and contribution to this study.

Finally, I would like to thank my family for their unconditional help and guidance in each phase of the study, and my friend and colleague Alp řahinoęlu for his great support throughout the study.

TABLE OF CONTENTS

SIGNATURE PAGE	ii
ABSTRACT	iii
ÖZET	iv
ACKNOWLEDGEMENTS	v
TABLE OF CONTENTS	vi
LIST OF TABLES	x
LIST OF FIGURES	xi
1. INTRODUCTION.....	1
1.1. Purpose of Research.....	4
1.2. Methodology and Hypotheses.....	7
1.3. Structure of the Thesis.....	9
2. UNDERSTANDING CREATIVITY.....	11
2.1. Creativity.....	11
2.2. Creative Thinking.....	14
2.3. Creativity in the Art of Children and Means to Support It.....	18

2.4. Processes and Tools in Understanding Creativity.....	23
2.4.1. Creative Person.....	25
2.4.2. Creative Process.....	39
2.4.3. Creative Product.....	44
2.4.4. Creative Environment / An Environment Supportive of Creativity.....	49
2.4.4.1. Instructional Techniques.....	51
2.4.4.2. The Materials Used Inside the Environment.....	57
2.4.4.2.1. The Materials Provided to the Students.....	57
2.4.4.2.2. The Furniture and Equipment Used in the Art-Room Environment.....	58
2.4.4.3. Space Organization.....	61
2.4.4.3.1. The Design and Organization of the Art-Room Environment.....	73
2.4.4.3.1.1. Flexibility in the Art-Room Environment..	75
2.4.4.3.1.2. Grouping in the Art-Room Environment...	78
3. CREATIVITY IN THE ART-ROOM: THE CASES OF ERKEN BAŞARI ELEMENTARY SCHOOL AND BİLKENT UNIVERSITY PREPARATORY SCHOOL.....	81
3.1. Definition of the Case Study.....	81
3.1.1. The Settings	82
3.1.1.1. Setting I: Erken Başarı Elementary School.....	83
3.1.1.2. Setting II: Bilkent University Preparatory School.....	86
3.1.2. The Sample Group.....	89
3.2. The Research Methods.....	93
3.2.1. The Questionnaire.....	94
3.2.2. The Observation.....	96
3.2.3. The Task.....	97

3.3. Results of the Study.....	105
3.3.1. Comparative Results of the Questionnaires.....	105
3.3.1.1. “The Person”.....	106
3.3.1.2. “The Process”.....	110
3.3.1.3. “The Product”.....	111
3.3.1.4. “The Environment”.....	113
3.3.2. Results of the Observations.....	119
3.3.2.1. “The Person”.....	120
3.3.2.2. “The Process”.....	124
3.3.2.3. “The Product”.....	125
3.3.2.4. “The Environment”.....	127
3.3.3. Results of the Tasks.....	127
3.4. Discussion of Results.....	135
4. CONCLUSION.....	140
BIBLIOGRAPHY	144
APPENDICES	
Appendix A: The Questionnaire Sheet	
Appendix A.1: Students’ Questionnaire	158
Appendix A.2: Teachers’ Questionnaire	163
Appendix B: The Observation Sheet	
Appendix B.1: Observation of the Students	171
Appendix B.2: Observation of the Environment	176
Appendix B.3: Assessments	178
Appendix C: Statistical Results	
Appendix C.1: T-Test Results of Person	180

Appendix C.2: T-Test Results of Process		190
Appendix C.3: T-Test Results of Product		197
Appendix C.4: T-Test Results of Environment		203
Appendix C.5: T-Test Results of Creativity Assessments		217



LIST OF TABLES

Table 3.1.	The Mean Scores of the Teachers and Students Based on the Questionnaires.....	107
Table 3.2.	The Correlations Between the Teachers' and Students' Responses in the Two Schools.....	108
Table 3.3.	The Comparison of the Observational Characteristics of the Two Schools in Percentages.....	122
Table 3.4.	The Results of the Creativity Assessments, Assessments of the Design Elements, and Design Principles, According to the Observer and Teacher.....	139
Table 3.5.	The Comparison of the Product Creativity of Each Individual Students in EB According to the Observer and Teacher.....	131
Table 3.6.	The Comparison of the Product Creativity of Each Individual Students in BUPS According to the Observer and Teacher.....	131

LIST OF FIGURES

Figure 2.1.	Isaksen's Table of the Relation Between the Elements Defining Creativity.....	24
Figure 2.2.	Firestien's Table of the Relation Between the Elements Defining Creativity.....	25
Figure 3.1.	Plan of the Art-Room in EB.....	84
Figure 3.2.	Section of the Art-Room in EB.....	84
Figure 3.3.	View 1 from the Art-Room in EB.....	85
Figure 3.4.	View 2 from the Art-Room in EB.....	85
Figure 3.5.	Plan of the Art-Room in BUPS.....	87
Figure 3.6.	Section of the Art-Room in BUPS.....	88
Figure 3.7.	View 1 from the Art-Room in BUPS.....	88
Figure 3.8.	View 2 from the Art-Room in BUPS.....	89
Figure 3.9.	Student Drawing from EB Depicting an Individual Seating Organization.....	101
Figure 3.10.	Student Drawing from EB Depicting a Grouped Seating Organization.....	101
Figure 3.11.	Student Drawing from BUPS Depicting Different Seating Organizations.....	102
Figure 3.12.	Student Drawing from BUPS Depicting a Grouped Seating Organization.....	103
Figure 3.13.	Student Model from EB Depicting an Individual Seating Organization.....	132
Figure 3.14.	Student Model from EB Depicting a Grouped Seating Organization..	133

Figure 3.15.	Student Model from BUPS Depicting Different Seating Organizations.....	133
Figure 3.16.	Student Model from BUPS Depicting a Grouped Seating Organization.....	134



1. INTRODUCTION

Any understanding of education includes the term *creativity*. This is why this study aims to combine the environment and creativity, and investigate how the design of the learning environment, in which learning and creative activities take place, influence the creativity of the students. The importance of creativity actually lies in this concept being a possession that is in reality quite ordinary and is a necessary condition of life itself (Abbs, 1989). Thus, the goal should be to provide students with the efficient modes of thinking creatively that will be used throughout life (Denel, 1981).

As the influence of education is significant on the modernization of countries (Moos, 1979), the factors that influence education, and that education is influential upon, gain even more importance in learning environments. The learning environment should be a place where improvement in education and the quality of the environment are in interaction as an ongoing process. It should tell the students to investigate, experiment, explore their environment, and play, because these are the stimulants of creativity, and raise the quality of the space, functionally and aesthetically (Colven, 1990). However, more information should be gained on educational environments and their users (Moore and Lackney, 1994).

The physical environment influences people in several ways. With this information in mind, designers (interior architects, architects, landscape designers) have the power to use the environment to contribute to the general well-being of the users of the building,

and help enhance the purpose of the environment. As childhood is very important in the development of decent adults, utmost care should be given to the design of learning environments (Edwards and Springate, 1995; Hebert, 1998; Heller, 1968). Improvement in creativity can be more clearly observed in art compared to other fields, and thus, the influences of the *art-room environment* on creativity were dwelled upon.

Until recently, the children were clearly taught and expected to obey certain rules and demands of the society which were controlled by the curriculum and the environment. However, the need for the environment and the curriculum to fit the needs of the individual child instead of just the opposite, is increasing each day (Baird and Lutkus, 1982). Every characteristic of the learning environment, of which the physical ones are especially important, should carry the appropriate characteristics in order to support the facilities inside that environment. However, the environment is generally not given the importance it deserves, and the characteristics of the learning environment are not taken seriously until something goes wrong (Freiberg, 1998). To support learning and creativity, learning environments necessitate equipment and spaces for the students to engage in exploratory activities, and that allow new curricula to be taught (Winslow, 1990).

In order to support the development of the child as a whole, all factors that enable and support the function of the space should be existent in the learning environment, as during this educational phase, not only the physical, but the mental and emotional development needs to be supported by the educational system (Ministry of National

Education of Turkey, 1997). Undoubtedly, there are several influential factors on the development of a child. However, the physical characteristics of the learning environment are perhaps the most effective. The characteristics of the learning environment should be fully understood in order to provide useful data ready to be used for the good of the inhabitants. Therefore, in conducting research on learning environments, everything in the learning environment is potential data (Smith, 1998). In addition, the physical features of the learning environment are the ones which are the most easily manipulated. Although this is true, any kind of change necessitates hard work (DeMitchell and Kerns, 1997; McQuillan and Muncey, 1998). The reason that hard work is necessary is perhaps a consequence of seeing the learning environment as a “passive shell for activity with walls surrounding the acts of teaching and learning”, which can still be observed in the management of learning environments (Lackney, 1994: 71). However, this has to change, and the learning environment must be seen as an active changing setting containing various levels of support for teaching and learning. Furthermore, it should be designed as a whole taking into consideration all the principles of design, and the equipment which can be used to improve the space (Lackney, 1994). The spaces provided for the facilities defined in the school should be designed according to the needs of the activity to take place inside that space, and the needs of the users of that space throughout the educational year (Ministry of National Education of Turkey, 1997).

This study examines spaces in which art activities take place, and the influence of these spaces on the students. The investigation dwells upon the “creativity factor” and how the

design and organization of the art-room affects the level of creativity in students, by examining the environment in which art activities take place.

1.1. Purpose of Research

Although there are examples of research on education, creativity, person-environment fit, and quality of the learning environments, research which integrate the environmental characteristics and student creativity in learning environments are next to none.

Moreover, there is not much research in educational research literature on “the role of the physical environment as a variable” influencing student outcomes (Lackney, 1994).

Furthermore, research on environmental influences is not as well developed as examining individual influences on creativity (Livingstone and Nelson, 1994).

In previous research on creativity, the outcomes of students have been evaluated in order to understand how students have used creative thinking in the tests that were given.

However, this evaluation is not sufficient in providing a total picture of the process of creativity in education, and the parameters that affect the process. Thus, “assessments of the learning environment” must be made in order to provide “information on the important aspects of life in the learning environment” (Fraser and Wubbels, 1995: 118).

The knowledge gained in educational environment research is a “heuristic tool that aims to improve future work” (Lackney, 1994: 15), and thus, there is a “crying need for studies of the influences of the educational facility design on performance” (Moore and Lackney, 1994: 15). Research in the area aims to integrate the results into the learning environment

in order to achieve efficient, social, and creative spaces for children to learn in (Moore and Lackney, 1994). Thus, this research aims to fill a gap in the areas stated above.

Though research on the social, emotional, and environmental qualities of classrooms began a quarter century ago, it is especially pertinent today for several reasons. First of all, the social and political pressure for greater student achievement is accelerating. Secondly, educators, like business people and other professionals, are increasingly realizing the importance of satisfying their “customers”. In education, a “satisfied customer” is considered a “successful learner” (Walberg and Greenberg, 1997). It is important to state here that, the present concern should be one of “getting beyond” the question of whether we can stimulate creativity (Talbot as cited in Treffinger, 1993). The focus should be on “how best to do this”, because if a “reasonable treatment” is carried out, and “variables” are chosen carefully to “represent a realistic operational definition of creativity”, the “performance” of the subjects will be enhanced significantly (Talbot as cited in Treffinger, 1993). Moreover, the means by which creativity is best stimulated also necessitates future research on the impact of other influential factors such as the “environmental” ones (Treffinger, 1993).

Although architectural design aims for user satisfaction, little has been done in evaluating the characteristics of a building that actually satisfy user needs and with which results (Baird and Lutkus, 1982; Fraser, 1991). Moreover, the influence of the environment on creativity has previously not been measured (Cramond, 1994; Torrance, 1970). In creativity research, verbal tests are most frequently used and thus, leave out visual

effects. This means that the effect of a non-verbal stimulation is generally not evaluated (Guilford, 1972). The present study, with its various methods, aims to bridge this gap. Moreover, the physical, curricular, and personal domains involved in educational research have until recently been studied separately, and it is likely that mismatches do occur when all three are not considered (David, 1982). The present study aims to combine the three, focusing largely on the physical attributes of the learning environment. Although there is a growing body of research in the fields of physical space, relatively little attention has been paid to the problem of assessing and measuring the significant attributes of physical space, and therefore, this makes it “difficult to draw connections between built environment and student behavior” (David, 1982: 174). Finally, the relationships between mediating factors such as “improved student-teacher interaction”, and educational outcomes, such as improved creativity, have not been adequately investigated (Moore and Lackney, 1994).

The need for research in the areas of learning environments and students is particularly significant in that the users are *students* who spend most of their times in the learning environment, and the certain limitations within the school originating from the design decisions may alter their capability to communicate with each other (Baird and Lutkus, 1982). Moreover, apart from measuring the objective qualities of a learning environment, it is also important to assess how the environment is functioning as observed by the students and the teacher (David, 1982). The significant aspect of research in these areas is the relationship between the educational system and how the learning environment can be manipulated to implement the objectives of that system (Proshansky and Wolfe, 1974). It

is important to provide a background that involves and encourages students in learning environments. In most schools, although educators aim for the students to be “actively involved in the world and with other people, the students are not given the opportunity to develop a reflective style of dealing with the world, and the physical environment, especially when the school does not allow for this” (Proshansky and Wolfe, 1974: 620). Research in the fields of design and creativity will serve to improve the understanding of the variables involved, and better definitions and applications can be obtained. This will enable a more precise starting point for future research. It is important to achieve a more holistic and comprehensive approach for future research, as it is wrong to over-simplify creativity, and the effects of the environment on it (Isaksen et al., 1993b). Finally, it is significant to study people as subjects involved in activity in their environment and dealing with situations (Noschis, 1982). The aim is to improve student creativity by establishing art-room environments found advantageous for the aim.

The present study aims to stress these ideas and combine them to fill a gap in research by examining creativity and the environment together. It also aims to find out how the creativity of students in art classes may be encouraged, how these activities may be promoted, and how spatial characteristics can be used to promote user satisfaction.

1.2. Methodology and Propositions

The research question is to investigate the approaches to improve creativity and the general well-being of students in the art-room. This investigation proposes and tests the following propositions: The first proposition is that the designed environment has

significant effects on people, and behavior and outcomes may be enhanced by the environment. It is also proposed that, the environment permits or inhibits interaction between users due to size and organization. A proposition related to the first one is that, the size of the art-room environment may be influential on the kind of activity to be done, that is, in a small space, students may not be able to implement large projects. The second proposition is that, grouping and flexibility inside a learning environment are influential on student creativity. Finally, the third proposition is that the organization of the art-room is influential on the message given to the students.

The sample groups in this study were two art-classes of sixth graders. There were 11 students in the first, and 13 in the second school (ages 10-12), on which the methods of observation, questionnaires, and the assessment of a certain given task were tested. The teachers of these art classes were also given questionnaires, as in the assessment of the learning environment, two most popular methods are the observational systems and the questionnaire surveys (Meisels, 1996-1997; Nielsen and Kirk, 1974; Torff, 1997). The given task aims to find out the amount of creativity, and the kind of environment the students like to work in to best stimulate creativity. The characteristics of the creative individual, her/his behavior traits in the creative process, and the stages of the creative process were used as guides during the observation. Teachers were interviewed as well as the students. This was done in order to be able to compare with the teachers the responses of the students.

The design and management of a classroom can encourage the users to identify with and thus, reshape, control, and make better use of their learning environment (David, 1982). As a better use of the environment is achieved, creativity has a ground to flourish on. The purpose should be to create guidelines for better, safer, more comfortable, and more efficient learning environments which support and encourage creativity in children, in addition to enabling the users of the building to be more aware of their environments, and the factors that may be influential on their work.. This necessitates the investigation of learning environments and the understanding of the necessities of an art-room environment to support creativity, along with the evaluation of the outcomes of students.

Finally, in this study, explanations are given on learning, instructional techniques, the teacher and learner, and how the learning environment should be, in order to support the creative process. These assumptions were tested along with the propositions and results were discussed. These are the pieces that constitute this research.

1.3. Structure of the Thesis

This study dwells on the effects of the physical environment on creativity, and the means by which the characteristics of the art-room environment can be manipulated to encourage the creativity of the students.

First of all, in the second chapter, creativity is defined by referring to existing literature, and the modes of thinking that are used during the creative process are explained.

Moreover, how creativity may be recognized in the art of children, and the ways of supporting it are discussed.

After the investigation of the processes and tools in understanding creativity -the creative person, process, product, and environment- the importance of the design and organization of the art-room is analyzed, dwelling upon the flexibility and grouping inside the space. Furthermore, the significance of materials and furniture used in the art-room is investigated.

In the third chapter, the research question, and definition of the case study are given in detail, with the settings and sample group. The propositions and variables under study are also explained with the research methods by which to test them. Following these sections, come the sections in which the results are given, and discussed.

In the final chapter, conclusions drawn from the results are given as helpful guides for any further study that may follow, and in the design and organization of learning environments. This section is followed by the appendices that consist of the questionnaire and observation sheets, and the results of the tests that were carried out.

2. UNDERSTANDING CREATIVITY

This chapter deals with creativity and related factors such as, the “processes and tools”, and “behavior traits” to be able to obtain a clear picture of what the term means and how it can be seen from different perspectives. Furthermore, influential factors related to the learning environment are discussed, and the importance of the design and organization of the learning environment and its effects on the students are analyzed.

2.1. Definitions of Creativity

Creativity has been defined and investigated a number of times over the years, and thus, there are many different approaches to the topic. Different theories have been formed, and this section presents some of the most significant ones.

Creativity, in its broadest form, may be defined as the ability to generate new ideas (Joyce et al., 1998). Another definition of creativity is that it is the process of bringing something original into existence, and points to the significance of a *product* (May, 1980). However, in its very nature, this term is quite complex and is many times defined as a mystery (Joyce et al., 1998).

Creativity has also been stated to be a puzzle or paradox (Boden, 1996). It includes the process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies; identifying the difficult; searching for solutions; making guesses; or formulating hypotheses and possibly modifying and retesting them; and

finally communicating the results. These are the necessary components in a creative person assessed during a creative process (Gönen and Buluç, 1997; Haensly and Torrance, 1990; Torrance, 1970).

Creativity has also been defined as a basic behavior allowing a person to be objective and subjective at the same time. The term refers to the abilities that are most characteristic of creative people (Guilford, 1968). These definitions of creativity involve interactions between common sense, logic and emotions and feeling, being a process which involves the production of a product (Denel, 1981).

The characteristics of creativity, its complex origin (whether it is the process, product, person, or environment), and the factors involved in creativity, are significant in the definition of the concept (Haensly and Torrance, 1990). Thus, anything done to reveal the mystery behind the concept of creativity will be advantageous, as only after it is understood can it be used and manipulated according to the need (Haensly and Torrance, 1990). The significance of creativity should be understood, identified and developed, in order to develop the creativity of each following generation (Torrance as cited in Isaksen et al, 1993a).

Creativity provokes the interest of individuals, and makes them increasingly aware of what they are doing, and thus, is a great motivator. Moreover, it provides one with the possibility of accomplishment, and adds fun and excitement to life. It is important to

consider creativity as the major source in any kind of thinking, and as inseparable from life itself (DeBono, 1993).

It is a misconception that creativity depends only on “natural” talent. This is only true if nothing is done to improve it by providing training, techniques, and structures. The general level of creative ability can be enhanced. Since everyone can acquire creative talent, it is important to provide the necessary conditions to improve the essential factor of creativity through education (DeBono, 1993).

When one examines the educational implications of creativity, one can say that, “Creativity is the key to education in its fullest sense and to the solution of mankind’s most sensous problems” (Guilford, 1972: 127). Creative development strives for the “truth”, and learning that takes place under conditions which support creativity is, “enduring” as there is “built-in motivation that keeps the process going” (Torrance, 1970).

Finally, it may be stated that creativity is a kind of problem solving which involves acts that have some novel, original, and surprising consequences. The problem is generally vague and not clearly defined in the creative process, and thus, formulating it is also a part of the problem itself (Fischer, 1993). Art is one of the fields in which creativity can be most efficiently studied as the problems in art and design are ill-defined, open-ended, and without a single solution (Fischer, 1993).

2.2. Creative Thinking

The abilities believed to be the most relevant for creative thinking are in two categories. One category is “divergent thinking” abilities. These abilities pertain to generation of ideas where variety is significant, as in solving a problem. The varieties of abilities within the divergent thinking category depend on the kind of information with which the person is dealing. This factor strongly suggests that creative talents depend on the media in which the person is working (Guilford, 1972).

The divergent thinking approach to the creative process is the most reliable means of exploration and has the most explicitly developed base, is supported by most of the creativity tests, and has generated most research. The term, “divergent thinking” goes back to Guilford and his structure of *The Intellect Model (SOI)*, which specified 180 cognitive factors under three types of functions: mental operations, contents, and products. Divergent thinking is one of the six mental operations where *evaluation*, *convergent production*, *memory retention*, *memory recording*, and *cognition* are the remaining operations (Brown as cited in McCann, 1998).

In addition to these operations, *transformation abilities* are also used and these pertain to revising what one experiences or knows, and thus, producing new forms and patterns. Moreover, readiness to be flexible is a general characteristic of this group of talents, where flexibility leads to reinterpretations. The variety of transformation abilities depend on the kind of information or media with which the creators deal (Guilford, 1972; Ward et al., 1995).

Divergent thinking is widely associated with being an important aspect of creative thinking and creative problem-solving process (Runco, 1991). In addition, conceptual models are used by researchers and practitioners that involve divergent thinking in addition to the attitudes toward divergent thinking practice. This would mean that improvements have to be made toward divergent thinking, in order to achieve success in the training efforts in creative problem solving. Studies (Basadur et al., 1999; Runco, 1991), show that it is possible to successfully change the attitudes of individuals toward divergent thinking, and that appropriate training can accordingly result in positive effects even in individuals whose ideas are difficult to change.

A person who thinks divergently “thinks up many novel options and ideas”; “searches out many facts and different points of view”; “defines problems in multiple and novel ways to get a variety of angles on them”; “creates unusual, though-provoking ideas”; “extends effort deliberately to get more options and ideas when it seems that all the options and ideas have already been exhausted” (Basadur, 1993: 291). Divergent thinking is a skill that everyone has available to some degree, and the level of such skill varies considerably among individuals. However, if an individual does possess this skill, but does not use the skill in appropriate situations (due perhaps to the lack of encouraging environmental conditions), it is difficult to define the person, process, or product as creative. Across task-domains, training in divergent thinking methods have been observed to enhance the use of these skills, and thus, creativity. The training of these skills is supported by the specific directions given to the subjects, and most significantly the *environmental conditions* under which the projects assessing creativity are given

(Baer, 1993b). This depends on the idea that creativity can be learned, improved, enhanced, nurtured, and is productive by the help of such supportive conditions (Gönen and Buluç, 1997; Isaksen et al., 1993b).

Although creativity is thought to involve only the method of divergent thinking, quite commonly both divergent and convergent thinking processes are used in the field of creative thinking and creative problem-solving. Furthermore, some models have been identified which consider both divergent and convergent thinking in multiple phases which are called complete processes of creative problem solving.

A person who thinks convergently, the second mode of thinking, “open-mindedly develops and uses unbiased criteria for selecting from among options, rather than letting preconceptions or hidden motives sway the decision”, “makes wise choices from among problem definition options in terms of *broadness* versus *narrowness* of focus” (Basadur 1993: 291). Moreover, s/he “does not wait for the perfect answer; takes only reasonable risks within time limits, “pins down implementation plans clearly, simply, and specifically”, “follows up on implementation; does whatever it takes to insure successful installation of the chosen solution” (Basadur 1993: 291). Although there are differences between in the two modes of thinking, both are used during the process of creative activity, in order to bring about a product that can be called creative.

These two methods of thinking involve certain abilities during the stages of a creative process. In creative thinking, *synthesizing ability* which includes the organizing of ideas

into inclusive patterns, and *analyzing ability*, and *practical ability* is very important (Guilford, 1968; Sternberg, 1990; Sternberg and Lubart, 1995). These abilities are influenced by the environment, thus, the environment in which creative thinking is expected to take place must carry the necessary characteristics which supports these capabilities.

Guilford, in his earlier studies (1968) had stated that creative individuals think with greater *fluency*, *flexibility*, and *originality* (McCann, 1998; Torrance, 1970). Here, *fluency* stands for the production of many ideas; originality for the uniqueness of ideas; flexibility for the modifiability of ideas; elaboration for the extension of ideas (McCann, 1998). The tests to measure fluency expected the individual to solve simple tasks with a large amount of output, with quantity instead of quality was the main concern. Undoubtedly, the output had to be appropriate at the same time. *Flexibility* involved a “change”, which could be explained as an interpretation, use of the material in a different way, understanding the material, a change of strategy in doing the task, a change in direction of thinking, or a new interpretation of the goal (Guilford, 1968; Torrance, 1970). The meaning of *originality* necessitates the production of unusual, remote, or clever responses that did not exist before (Cramond, 1994; Hanson, 1985). *Elaboration* is a factor which has been added later on. This factor can be explained as the variety of implications that an individual produces. During the examination, the more details the individual adds, the better is his score. The ability to sense deficiencies and to redefine them have been added to these definitions later on (Cramond, 1994).

Guilford (1968) had stated that the basic investigations on creativity would take two major directions. The first would be toward a better understanding of the processes of creative thinking, and the other would be toward an investigation of the conditions that influence creative thinking, positively or negatively. This research will investigate the latter factor, and will stretch its dimensions into interior architecture and to a detailed look into person-environment interactions. The characteristics of fluency, flexibility, originality, and elaboration seen in an individual during the creative process can be extended with the characteristics of novelty, self-courage, sensitivity towards the environment, need of completion of work, control over behavior, negativity in attitude (such as opposition or egotistic behavior), preference of movement while working, identification with work, concentration on work, need of isolation while working, and humor (Guilford, 1968; Ritson and Smith, 1975; Strong et al., 1995). These were the characteristics that were used to define the framework.

2.3. Creativity in the Art of Children and Means to Support It

Each child is an individual who expresses her/himself uniquely, and is different from all other children. However, it is also important to remember that children have many things in common and obviously with all human beings. In order to teach art effectively and creatively, teachers must blend the nature of creativity and the nature of art with the nature of every child (Ritson and Smith, 1975).

Among the pioneers of research in the study of children and the creative process involved, especially the relationship of children to normal art processes - that is, art as a

means of expression for a child was Viktor Lowenfeld. Lowenfeld (1975) discovered that there were certain similarities in the techniques and the processes which children go through. These *consistencies* (which later were classified as *stages*) helped to establish a common form of communication and terminology for scientific investigation. Another advantage of Lowenfeld's (1975) studies was that educators began to see the "art lesson" and aspects involved from a whole new perspective, respecting the normal growth of children in art. All modes of expression were seen as important developmental stages of art. However, the "uniqueness" factor mentioned above should not be forgotten while these stages are analyzed, and thus, children who deviate from the norms should not be seen as abnormal or unusual. In fact, they may be seen as the most creative. These norms help researchers and teachers to recognize and understand various behavior patterns in children, so that they can better understand how the students struggle to obtain their own answers to problems they encounter in their environment, instead of imposing certain answers on them (Ritson and Smith, 1975).

Lowenfeld's stages are "the scribbling stage", "the preschematic stage", "the schematic stage", the stage of "dawning realism", and "the pseudo-realistic stage". These stages begin at the age of 2 with scribbles as drawings, and continue to the age of 11 with a great deal of self-criticism, awareness of differences in colors and forms and "art" as a whole (Ritson and Smith, 1975: 74).

The child at the age of eleven or twelve, becomes increasingly aware of his natural surroundings, details, the difference of the sexes, begins to worry about proportion and

depth in art-work, and is eager to develop artistic skills. Elaboration and care may be observed in art-activities. Although intelligence is developed, unawareness still predominates, and thus, the teachers should be consulted in research. An unconscious naturalistic approach to art is prevalent. In children at this age, a great love for dramatization and action is seen. Moreover, an urge for three-dimensional expression is seen. In drawings, horizon lines, diminishing sizes are seen and in other activities care is given to depicting a similar environment as to the one around them. Furthermore, the first conscious approach to styling is seen with attention being given to depicting the function of different materials with related designs. At this stage, an awareness of the attitudes, and values of other children, adults, and the society as a whole, especially in relation to art develops. Towards the end of this stage, this awareness produces conflicts within her/him and this has major influences on her/his art expression. Therefore, an environment in which the child feels the most comfortable will enable the child to be more expressive of the feelings, learning, and creativity. Other factors stated by Ritson and Smith, may be held responsible for the decline of spontaneity, symbolism, and creativity in children's art by the time they reach their middle-school years (1975: 83):

1. The overconformity of formal learning, which has been declared a barrier to creative productivity.
2. The uncreative use of a creative area. Art is frequently used poorly as a tool for teaching reading, mathematics, social studies, and science, thus, the concept of art in children may depersonalize the experience and make certain skills another way of conforming in order to gain a "coveted grade" or "needed status".

3. Situations, which encourage sensitivity to aesthetic forms, the joy experimenting, and taking risks become fewer and fewer as the child goes through formalized schooling. Moreover, s/he experiences pleasure and success obtained from engaging in activities of this type are so few that the senses become dulled and they gradually fade from the child's repertoire.
4. Finally, teachers are not trained to develop creative expression. The child's drive to engage with her/his environment is in conflict with the school's desire to teach her/him to become acquainted with a particular set of happenings provided by adults which may or may not bear any relationship to her/his world. Consequently, her/his ability to express his ideas and feelings through the use of art media diminishes.

Some art-educators believe that the process which children go through as they move from one stage to another in the production of art, may show progress with the help of sensitive teaching or guidance. Each student must be given the opportunity to practice as much as s/he wants, and as s/he does his accomplishments will predict later accomplishments (Walberg, 1991).

The artistic activity is a complex activity, which may be influenced by teaching. Thus, the art program should extend beyond the limits of just a lesson. The program should attend to the *critical* (experiences that aim at the development of the child's ability to perceive the aesthetic qualities of the world), and *historical* (attempts to help children

understand the fact that art is part of human culture which is affected by it) domains as well as the *productive* domain (Ritson and Smith, 1975).

To shed light on the topic of understanding the process of art which the students experience, there emerges a need to analyze the products of art which the children produce (Eysenck, 1996; Ritson and Smith, 1975). As children experience changes in their lives, these changes are reflected upon, and expressed in their art-work, so their psychological state, learning, and the creativity involved in the product may be observed.

Children, while creating may be seriously damaged emotionally, if they can not adapt to the art-room, and are not comfortable. Moreover, it adds to their discomfort if their products are evaluated negatively, indicating that there are strict rules in the art-room. Therefore, the teacher should be concerned that the children relate to their environment, but not that they act according to the teacher's own standards and rules (Cheung and Petrie, 1998; Ritson and Smith, 1975).

Ritson and Smith (1975) state that, "The teacher's job is that of helping each child find his own answers by understanding and recognizing as well as possible those signals that he sends out indicating that a creative problem-solving process is underway." (73).

Therefore, the teacher should not interfere with the students' work, but support it. Guidance of the teacher is necessary in order to be able to enhance the development of creativity in children. The teacher has an important role in manipulating for the

advantage, the characteristics that have impact on creativity. In order to be able to do that, one must understand the processes and tools by which creativity is defined.

2.4. Processes and Tools in Understanding Creativity

Due to the complex nature of creativity, a single definition is never enough to fully grasp the concept. One can elaborate on the definitions infinitely. Most theorists study creativity as both an intervening variable, used to explain relations between stimuli and responses, and a trait (McCann, 1998). In order to form a unifying approach to creativity, Rhodes (as cited in Firestien, 1993) examined several definitions, and concluded that they focused around four strands that overlap and interrelate. These four strands which were the *creative person*, the *creative process*, the *creative product*, and the *creative environment* (Brown as cited in McCann, 1998; Firestien, 1993; Feldhusen, 1995; Slabbert as cited in Gilbert and Penshaw, 1996) have to be understood in order to fully grasp and define creativity. Isaksen (as cited in Firestien, 1993) introduced the concept of the *4P's* (person, process, product, and press or environment) of creativity as an overlapping Venn Diagram (see Figure 2.1), and this approach has been a base for most research on creativity (Runco, 1994; Ward et al., 1995). These factors interact continuously, when a creative person uses a creative process to develop a product that exists in an environment (Firestien, 1993; Jones, 1993) (see Figure 2.2).

These four tools would enable to define the concept of creativity and to see the interrelations between the different kinds of influential criteria. Different sets of criteria including motivational conditions, personality factors, environmental conditions, chance

factors, and products are effective on the topic of creativity. Although there is a relative uncertainty in the essence of creativity itself (Gilbert and Penshaw, 1996), one may understand the concept by means of studying the influential factors and the tools which the term itself provides us.

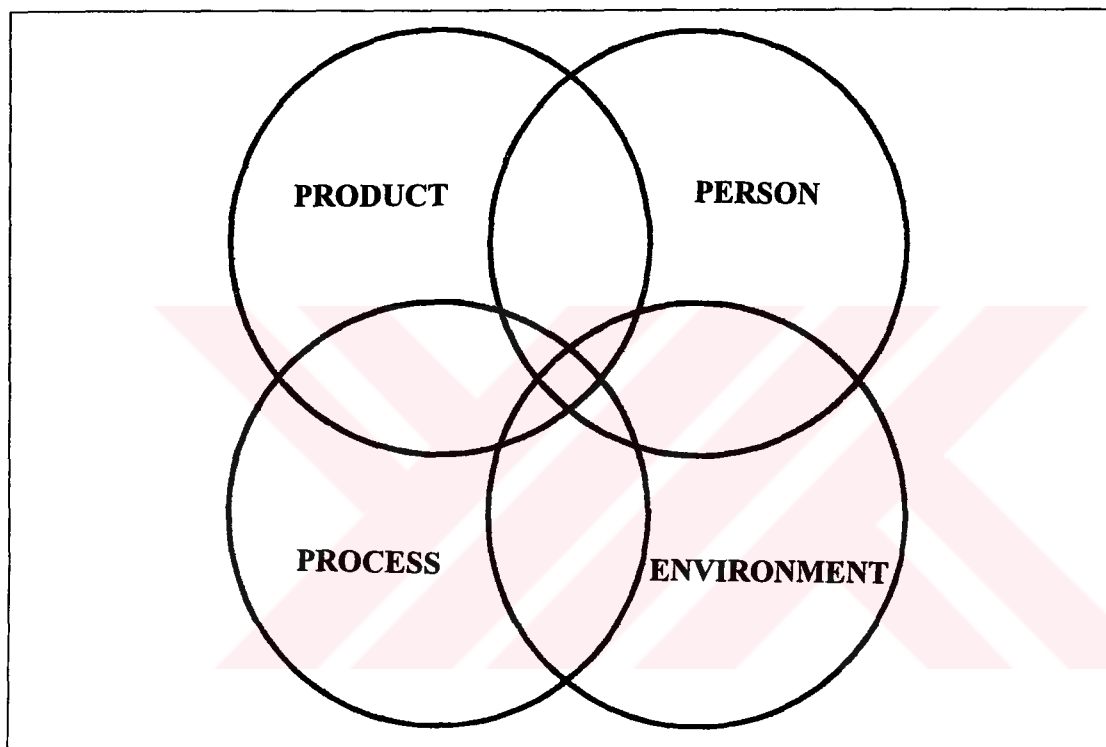


Figure 2.1. Isaksen's Depiction of the Relation Between the Elements Defining Creativity (Note: Modified by the author of this study).
(Firestien, Roger L. "The Power of the Product." 1993.
Nurturing and Developing Creativity: The Emergence of a Discipline.
Norwood, NJ: Ablex Publishing Corporation. p. 271)

Creative techniques and methods used purposefully during the creative activity prepare the grounds for the coming into being of a creative product. The environment and changes in the environment have been identified as the most important factors in the stimulation of these techniques. Supportive environments, domain-relevant skills, and

disciplined use of techniques form the core of measuring the related concepts of creativity (Gilbert and Penshaw, 1996). The aim, of course, is to define a recipe for innovation and creativity, for the total of the idea generation process, such that it turns into something which is stimulated at will (Hays, 1989; Joyce et al., 1998).

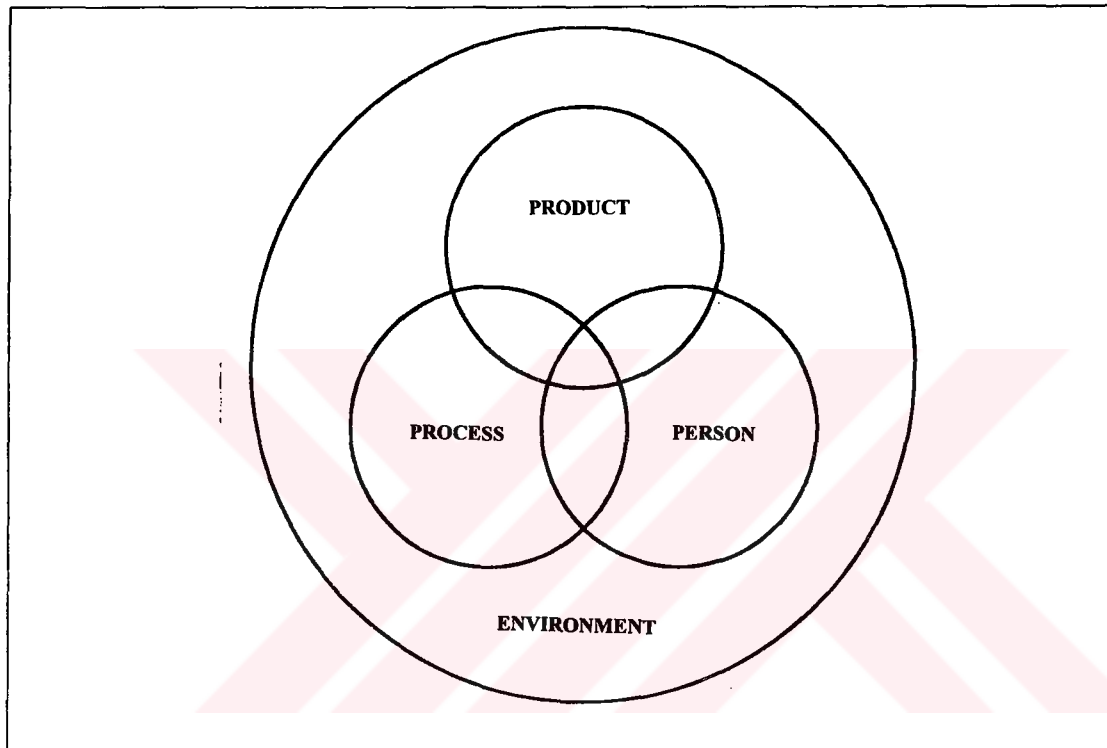


Figure 2.2. Jones's Depiction of the Relation Between the Elements Defining Creativity
(Note: Modified by the author of this study).

(Jones, Les. "Barriers to Creativity and Their Relationship to Individual, Group, and Organizational Behavior." 1993.
Nurturing and Developing Creativity: The Emergence of a Discipline.
Norwood, NJ: Ablex Publishing Corporation. p. 135)

2.4.1. Creative Person

There are certain behavioral characteristics belonging to the creative individual. These characteristics have to be worked on, to be able to encourage creativity (Antonietti, 1997; Sternberg, 1995-1996). The earliest studies on creativity show that the creative person is

capable of unusual abilities to think fluently, remember certain information in indirect or unusual ways, think in a flexible manner, being able to change without being bound to habits, being able to elaborate on what s/he knows embellishing it with numerous additions (Guilford, 1968; Ward et al., 1995). It had been proposed that creativity in visual stimulation would require abilities of similar character, such as *fluency, flexibility, elaboration, originality, ability to see deficiencies*, and the *ability to redefine* (Guilford, 1957).

Creative abilities determine whether the individual has the power to exhibit creative behavior to a noteworthy degree. These definitions may or may not lead to a *product* of creative nature as several other factors are influential from one point to the following. What is significant is to know that a broad range of qualities contribute to creative productivity among which the environmental ones are very significant.

Gardner's definition of the creative individual is (McCann, 1998: 2): "a person who regularly solves problems, fashions products, or defines new questions in a domain in a way that is initially considered novel but that ultimately becomes accepted in a particular cultural setting".

Moreover, a creative individual is often described as an open, fluent, imaginative risk-taker who is capable of original thought (Gilbert and Penshaw, 1996; Gönen and Buluç, 1997; Haensly and Torrance, 1990; Segal and Segal, 1990). These characteristics

necessitate being able to escape from pride, self-courage, constructive thinking, wholeness, freedom from habit and a curious character in order to flourish (Denel, 1981).

The idea behind the investigation of the creative person presumes that there are certain differences between individuals called creative and the ones who are not. According to this view, some people are judged as more creative than others, depending on specific behavioral characteristics that they portray. Although, creative individuals' minds may be accepted to work differently from others, creativity is accepted today to depend on knowledge collected from several different sources in the environment, and the ways in which people apply that knowledge. It is important to see that creativity is to some degree present in all individuals, and that it can be enhanced, developed, and increased by several factors (Basadur, 1993; Guilford, 1968; Ward et al., 1995).

In order to be able to investigate the process of creativity, the behavior traits of the creating individual and the abilities that are most characteristic of creative people, have to be defined, so the process of creativity can be observed, and the stages of creative activity can be distinguished (Haensly and Torrance, 1990).

Three components define the stages of creativity. The *creativity-relevant skills* operate at the most general level, in that an individual produces large amounts of unusual responses in many domains of behavior. *Domain-relevant skills* operate at an intermediate level of specificity. This component includes skills relevant to the general domain, rather than skills relevant to only a specific task within a domain. Finally, *task-motivation* operates at

the most specific level. Motivation may be very specific to particular tasks, and may even vary over time due to interest and engagement in the task. All of these skills are necessary for the achievement of a creative end-product (Amabile, 1990).

Research on the personalities of children identified as creative has made valuable contributions to the understanding of how conditions can be set for use in research for all children to better develop their total creativity (Ritson and Smith, 1975). A creative child is not like other children, although all children can be creative to a certain extent.

Because of this high creative drive, s/he develops certain characteristics that alter her/his behavior and make her/him different. They may be noisy, annoying, and hyperactive in the learning environment.

Children possess varying degrees of creativity, developed or undeveloped, largely because of the environment in which they live in. The characteristics stated below are largely descriptive of children who fall near the *highly creative* end of a continuum:

❑ Creative children are superior to non-creative children in their fluency, flexibility, originality, and elaboration. Unconventionalism, social sensitivity, non-defensiveness, reasoning ability, drive to produce, a greater will to concede faults, and close ties with parents are characteristics also seen in creative individuals. The teacher in the regular classroom can readily observe these qualities in their students (Feldhusen, 1995).

❑ Creative children tend to be more withdrawn than non-creative children. They tend to be low in sociability and are often estranged from their peers and their teacher. These children tend to work in isolation. Furthermore, they are known to have wild and silly

ideas. Their work is often off the beaten track. In terms of art behavior, an observant teacher may easily observe that her/his products rate high on originality. While working on her/his art products, s/he may often be by her/himself mentally even though s/he may be physically near other children. In discussions, s/he is the one who often has her/his hand raised and when called upon may have unusual or even unreasonable ideas.

However, the creative child is not often chosen to be on teams or to work with other children. Creative children may take active part in discussion and may speak fluently when called upon, but for the most part they work and study by themselves and do not have a buddy, nor do they mingle with the total class group (Ritson and Smith, 1975).

□ Creative children are more stable than the average children. They are more self-sufficient, confident, more self-accepting, and more independent of judgement. In addition, they control their own behavior frequently, and they are often uncooperative and egocentric. A creative child tends to go to work more quickly than others do. S/he does not ask for help from her/his teachers or classmates as often as other children. A preference for working alone and intense independence can be observed. S/he has ideas of her/his own that s/he intends to carry out regardless of interferences and interruptions. This often leads to selfish acts on her/his part, such as hoarding certain materials that should be shared with others. S/he seems to be emotionally mature and able to cope with abuse, ridicule, sarcasm, and antisocial acts inflicted upon her/him. Furthermore, creative children seem to be compelled to complete a creative job once they have begun. Thus, they often hurry their way toward a finish, pushing out of their thoughts and minds anyone or anything that gets in the way. They seem to possess great amounts of energy and enthusiasm to complete the jobs that they begin. Because they become so absorbed in

their own work, they are often inconsiderate of and uncooperative with others. In general, they are regarded as *self-centered* and *egotistic* by their peers (Feldhusen, 1995; Slabbert, 1994).

❑ They engage more frequently in solitary activities, and are more likely to question the status quo (Dacey, 1989).

❑ They are more independent of the judgement of others, are less afraid of their own impulses and hidden emotions, and like to do their own planning and make their own decisions (Dacey, 1989).

❑ They need the least training and experience in self-guidance, and do not like to work with others and prefer their own judgment of their work to the judgment of others (Dacey, 1989).

❑ They therefore seldom ask other students or teachers for their opinions, and take a hopeful outlook when presented with complex, difficult tasks (Dacey, 1989).

❑ The creative child is characterized by her/his excellent sense of humor and her/his playfulness. S/he is also adventurous, and willing to take risks. Furthermore, s/he does not like to judge, but s/he is superior at perception. S/he is more resourceful than the average child. The sense of humor of creative children is obvious by their wisecracks, witticisms, and daring remarks (Ritson and Smith, 1975).

❑ Creative children are generally more willing to try out new media and to experiment with material. They seem to be better able to use materials at hand or to invent tools and media if the desired ones are not available (Ritson and Smith, 1975).

❑ Creative children are more nonconforming than other children. They tend to conform less than non-creative people even under group pressure. They are interested in

unconventional careers, and are more radical and more complex as persons. In addition, they are less subject to group standards and controls. They do not like to follow models or examples. They sometimes perfect a skill by copying (Ritson and Smith, 1975).

□ Creative children are more emotionally sensitive than the average person. They have fuller access to their own life experiences because they do not suppress impulses and imagery as much as conventional children do (DeBono, 1993; Feldhusen, 1995). Creative children react to experiences more fully in thought and feeling, although some, such as the artists react more with feeling, whereas others, such as the scientists react with more thought. A heightened sensitivity to details, patterns, and other phenomena in the physical environment may be observed (Feldhusen, 1995).

□ Creative children may often ask questions about seemingly insignificant parts of an experience. In attempting to answer such questions, the teacher may find that they are highly significant. Creative children are also much freer about transferring life experiences into symbolic or pictorial representation (Ritson and Smith, 1975).

□ They are more sensitive to the existence of problems and are able to think both analytical and intuitive in their thinking (Dacey, 1989).

□ They are able to think both convergently and divergently, demonstrate greater determination and perseverance, and are less defensive about accepting new information (Dacey, 1989).

□ They usually see themselves responsible for most of what happens to them, however, they enjoy being playful and childlike (Dacey, 1989).

□ They generally have the most ideas when a chance to express individual opinion is presented, although these ideas may be made fun of by the other students (Dacey, 1989).

- ❑ They are most likely to stand their ground in the face of criticism and are the most resourceful when unusual circumstances arise (Dacey, 1989).
- ❑ They are not necessarily the best students, but they show an imaginative use of many different words (Dacey, 1989).
- ❑ They are more original, and their ideas are qualitatively different from everyone else's (Dacey, 1989).
- ❑ They are more tolerant to ambiguity, prefer disorder, and possess good feelings about being different (Dacey, 1989).
- ❑ A creative person becomes, to a high degree, the individual s/he is capable of becoming. S/he is more likely to fulfill her/his life potential. Sometimes s/he is judged to be socially irresponsible, but this may be due to the fact that inner security makes it unnecessary for her/him to seek approval from others by following all the rules and conventions of the society. S/he may be very responsible, but is not a conformist (Aiken, 1994; Denel, 1981; Ritson and Smith, 1975; Feldhusen, 1995).
- ❑ Those who are willing to take greater risks are regarded as more creative (Nageotte, 1998).
- ❑ Creative individuals become absorbed with a high level of energy in their work, while participating in a task, and may lose the sense of time and place (Yong, 1994).
- ❑ Interest and willingness, in addition to imagination is seen in creative individuals while they are working on a certain task (Firestien, 1993).
- ❑ Finally, early mastery of knowledge or techniques in a field or art form may be observed in individuals during the creative process (Feldhusen, 1995).

Creative needs are needs that lead one to contribute to new situations, rather than adapt or adjust to readily existing situations, and should be satisfied in order to enhance the overall creative character of an individual (Torrance, 1970). These needs have observational implications, thus, may be observed during a creative activity, and whether or not an individual is involved creatively in a task. Curiosity needs, need to meet challenge and to attempt difficult tasks, need to give oneself completely to a task, need to be honest and to search for the truth, need to be different, and to be individual, are characteristics which may be observed in persons involved creatively in a situation (Torrance, 1970).

Curiosity needs, are one of the most characteristic features of creativity. How this curiosity is treated by his environment affects the child's overall creativity. The child constantly asks questions about things that puzzle her/him, and is attracted to the puzzling, unknown, and unusual. The need to meet challenge and to attempt difficult tasks is another common characteristic of creative individuals. The child is attracted to the unknown, tests her/his own limits, tries to be different, attempts difficult tasks, makes honest mistakes, responds to challenge, and seeks for stress. The need to give oneself completely to a task involves being fully absorbed in a problem, become preoccupied with his ideas and problems that s/he is ignorant of what goes around her/him. These individuals are generally considered absent-minded, and may even fail in a test because of becoming preoccupied in a specific part of a test. The need to be honest and to search for the truth is the very essence of creative personality. This search leads to independence in judgement, courage in convictions, emotional sensitivity, intuition, motivation, and

openness to experience which are common characteristics in creativity (DeBono, 1993; Torrance, 1970). The need to be different is perhaps the most fundamental of the creative needs. This need does not exist for the sake of being different, but because the creative person needs to be different to attain his potentialities. However, it is not that often that a child is respected for his individual character, where appearing to be becomes more important than actually being. This is unfortunate, in that it diminishes the drives of the child to become oneself (Torrance, 1970). All of these needs have to be supported in order to flourish, and the environment must provide the opportunity to do so.

Freedom for non-conformity against conformity could be construed as novelty available to all, and includes new ways of looking at problems. Perceptions that creativity demands absolute novelty would severely limit its appearance to only a few persons who have ever existed throughout history. Additional attributes of the creative person and activity are, being unusual and not common, being appropriate and not just applying the needs of the problem, being able to transform the form of the task, and condensation (to be able to bring together of a set of ideas in order to produce an original product or a new set of ideas (Haensly and Torrance, 1990).

Assessment, thus, may center either on what the individual does to produce creatively, and on the typical traits and personality characteristics of the person; or on the evaluation of the products of that process. It can be stated that frequency or the rate of producing words, ideas, associations, or ways of expressing oneself, defines the possibility of

producing an original and workable solution (Ediger, 1998; Gullo, 1984; Oosterhof, 1994; Puckett and Black, 1994; Haensly and Torrance, 1990).

Individuals tend to portray certain types of behavior when they are creating and working on a specific task. Art is one of the best ways that one can observe the stages of the process as an art activity needs the most creativity of all activities. The emotions which the student goes through during the activity will inevitably reflect upon the behavior. Furthermore, the release of tension by means of reflection of the emotions on the art-work helps the child feel secure and helps his emotional growth. The inflexibility which some students tend to show in class may gradually disappear when the inclusion of the self (direct or indirect) takes place and brings meaning to the art-work that the child has produced (Lowenfeld, 1975; Sapp, 1999).

The most prominent property of creative thinking is the ability to produce novel products with little input. This means that a creative way of thinking can help realize novel ideas which may be considered strange at first by the majority. Moreover, even if the students tend to become oppositional, annoying, or offensive in the ideas that they support, these types of behavior may be considered normal to some degree, as it is normal to go through these stages during the creative process. These types of behavior are ones which can be easily observed, as they are reflected and seen in every movement of the student. It is only when the student is supported by the features of the environment that s/he may portray creative behavior at its peak. Therefore, creative activity and thus, creativity can be enhanced and encouraged when seen as an attitude toward life, a way of operating, a

mode of behaving, rather than a particular ability (Fernald and Nickolenko, 1993). When seen as an attitude toward life, the child is more likely to feel at ease, and to show flexibility, comfortable body gestures, increasing awareness and the use of kinaesthetic experiences, movement, and identification with his own work (Lowenfeld, 1975; Proshansky and Wolfe, 1974; Sternberg, 1995-1996). Furthermore, as the child is more and more involved with his own work, s/he is more likely to feel attachment toward the environment in which s/he is working in. This attachment leads to an enhanced involvement in the task that s/he is working on, thus, leading to creative results (Antoniades, 1992; Gönen and Buluç, 1997). Another characteristic which the creating individual shows is the diminishing interest which s/he shows in other people and what they may be doing. The child in creative activity is completely involved in his own work, has no interest in asking questions, no time to look around for inspiration, and will work without interruption until the finalization of the task. Although, during the creative process the child tends to be in seclusion, in any stage s/he may be in need of movement, interaction with other students, forming groups with the other students, or flexibility. The space is important at the point at which the student needs this flexibility in order to satisfy her/his urge to move in her/his own personal manner, providing it to become a feature which may very well be used to the advantage of the students (Antonietti, 1997; Lowenfeld, 1975).

Furthermore, the creating individual directly or indirectly includes her/himself in the work. S/he starts living the event which s/he is portraying in her/his own artistic way, and her/his bodily gestures reflect this involvement in the most direct way. S/he may mimic

the features of the task, moving forward, or making gestures of “reaching out” in need of inclusion into the art-work. This identification is a widely used tool in order to understand just how involved, and thus, how creative the individual is. Inevitably, the child may feel involved in a task in which little creativity is shown. However, questioning the child in ways in which to understand just how much s/he feels included in the task is a revealing procedure, and may shed light on the topic. The student will tend to use phrases containing words such as, “I”, or “my” compared to ones such as, “There is a house”. Supported with the questioning of the child, when necessary, the amount of creativity involved may be easily observed, and this is to the advantage of the research since watching the child during the working process is the most exact measurement (Burgess, 1998).

In several art-rooms, it may be found out that a child will find her/his identity during the creative process, perhaps identifying with her/himself for the first time in her/his creative work. This helps promote the growth of the student, regarding the individual merits of each creative work (Lowenfeld, 1975).

Identification is one of the most important criteria to be considered in examining a child's work of art. Whether the child has an active desire to identify her/himself with what s/he produces, or not, should be considered in order to understand the relationship -if s/he has any- between the child and the work. Because it is difficult to re-encourage children who have lost their connections with the work they produce, the relationship should be provided and supported so it is not lost. The student has to be in an environment in which

s/he can be absorbed in the task s/he is dealing with, in order to establish this relationship (Russ, 1993). It is generally not difficult to guess the relationship and the meaningfulness if the child's work from the technical performance s/he shows. The more the child feels connected to her/his work and somehow identifies her/himself in it, the more successful - in terms of self-expression- s/he becomes in her/his art-work.

A student who turns to the teacher, or observer for assistance has not learned anything from the task, and is labeled as not identifying with the activity. The lack of identification means the product is likely to be uncreative. Moreover, characteristics such as politeness or generosity may hold children back from interacting with others, thus, preventing the group work which may be of advantage to individual creativity (Burgess, 1998).

One other characteristic that can be seen in the creating individual is that they have been observed to be "internally oriented" compared to the "externally oriented". This would mean that they are occupied in their own work, including themselves inside the task itself, and not in need of external stimulation or inspiration sources. Internally oriented students tend to adjust better in flexibly organized settings. When they adjust better, they tend to become more efficient and creative in the products that they produce, and in the activities that they perform. This adjustment then turns into an interaction where the individual designs the environment and in return, the environment affects her/him (Antoniades, 1992; Moos, 1987).

Basadur et al. (1999) have stated the importance of defining behavior traits and the "Creative Individual Stereotypes". They have identified the characteristics of having

scrambled minds, having unusual lifestyles, not being very organized, enjoying the challenge of finding different ways to solve problems, adopting new perspectives in their outlook on life, easily defining problems, thinking outside the normal boundaries, with the creative person. They believe that everyone has some creativity within her/himself and can use this source to create new ideas. Under the right conditions, they state that every individual can be creative. Moreover, s/he states that creativity can be taught thus, learned and enhanced under the right circumstances (Basadur et al., 1999). This improvement in individual and group creativity can be done by means of a supportive environment and the interaction between the environment and the individual who is to be involved in a creative activity (Denel, 1981). Creative behavior and performance can be developed to produce creative products, to the extent that one is not too busy or too intimidated by the concept of divergent thinking (Alter, 1991; Basadur et al., 1999; Denel, 1981; Gilbert and Penshaw, 1996; Gönen and Buluç, 1997; Hanson, 1985).

2.4.2. Creative Process

The creative process includes knowledge, and many operations the mind performs on that knowledge. The process is the tool for using the knowledge that the individual readily possesses (Ward et al., 1995). Pressures work either to foster or to inhibit creativity. The creative process is discouraged if a person knows how to be creative, but is in an environment which constantly discourages creativity (Kawenski, 1991; Ward et al., 1995).

The following set of factors of problem solving can be considered in the assessment of the creative process (Feldhusen, 1995: 257).

- ☐ Sensing that a problem exists,
- ☐ Identifying a problem specifically,
- ☐ Asking questions about the problem,
- ☐ Guessing causes,
- ☐ Clarifying the goal,
- ☐ Judging if more information is needed to solve the problem,
- ☐ Identifying relevant aspects of the problem situation,
- ☐ Redefining new use of familiar objects,
- ☐ Seeing implications of some action,
- ☐ Sensing what should follow problem solution,
- ☐ Selecting the best or more unusual solution among several possible solutions.

Seeing creativity as certain characteristics that individuals possess, enables the assumption that there is a distinctive process through which the individuals go during the course of creative activity (Bailin, 1994; Denel, 1981). Taking this into consideration, it can be stated that art, humor, and science are all products of the same kind of process, with different modes of coming together and different emotional responses (Bailin, 1994).

The brain contains several habits which have been formed through experience which are essential in the organization of behavior. Most art-work take place within the borders of a

certain *framework* and involves rules and regulations. However, these habits, rules and regulations can inhibit creativity and have to be broken in order to be involved in the creative process. Thus, the creative process is a difficult one, in that, it is destructive of the structured patterns of the mind, as well as being constructive of the creative product. When a balance is established between these two conflicting modes of thinking, useful results may be obtained (Bailin, 1994).

A description of the stages included in the creative process may be such that, *preparation* during which the problem is investigated when one spends time on the problem to fully grasp and understand it, *incubation* during which one spends time on the gathering together and solving of ideas in order to identify and indulge in the problem, *insight or illumination* during which the happy idea occurs along with the emotions felt before and during that event, *concretization or verification* during which the work achieves its final form (Dewey as cited in Denel, 1981; McLaughlin, 1993; Wallas and Patrick as cited in Bailin, 1994). These stages interact throughout the creative process, with the most obvious being insight (Bailin, 1994).

The creative process implies that the choices being made during the creative activity are important, and should be evaluated. No specific process can be called creative as there are several steps involved (Slabbert, 1994; Yildirim, 1973). The quality of the process consists of several interactions that go on in a classroom between staff and children, staff, parents, and other adults, among the children themselves, and the interactions children have with the many materials and activities in the environment, as well as those features,

such as space, schedule, and materials that support these interactions. Research in the area of creative process has shed light on the various steps, stages, and strategies involved in the creative process (Isaksen et al., 1993b).

Guilford (1968), regarding the predictability of the stages of the creative process stated that, “the general psychological conviction seems to be that all individuals possess to some degree all abilities, except for the occurrence of pathologies. Creative acts can therefore be expected, no matter how feeble or how infrequent, of almost all individuals” (81-82).

If a creative pattern is considered to include activities such as inventing, designing, composing, planning, and contriving; the persons who exhibit these types of behavior may be called *creative*. Spontaneity and self-confidence are essential in sustaining the creative spirit (Segal and Segal, 1990).

Creativity is believed to come about as a result of irrational thinking, and as something other than the logical (Haensly and Torrance, 1990). Creativity may also be described as a fundamental life-process, essential for the well-being of each human-being. According to this view, as opposed to the idea of creativity being a gift, creativity occurs when an individual combines new ideas, processes, or attributes and translates them in order to create a new idea or a set of ideas. This view enables one to see creativity as a personal potential, rather than academic progress, or an asset judged according to specific and precise rules (Gilbert and Penshaw, 1996).

Similarly, Sternberg rests his theory of creativity on six resources for creativity. These are: *intellectual processes, knowledge, intellectual style, personality, motivation*, and most important of all, *the environmental context* (McCann, 1998). The environmental context is composed of several factors which are interrelated. However, the factors which can be changed and used for the advantage in the easiest way are the physical ones. Organizational influences on the process of creativity, outputs of the process, and individual characteristics influences the process are included in definitions of creativity (Livingstone and Nelson, 1994). The significance of creativity to the well-being of the society is increasingly recognized and emphasized (Mumford and Gustafson as cited in Basadur et al., 1999). Creativity is a necessary component of organizations and the effectiveness, efficiency, success, and achievement in them. Well established procedures have to be changed if there is the hope for improved levels of creativity and efficiency (Basadur et al., 1999).

During the observation of the creative process, the observed characteristics must depend on certain concepts previously studied by researchers. Thus, polarizations of behavior may be stated as follows; searching for stimulus and avoiding stimulus; fluent and rigid; open and closed; evolving and ritualized; repetitive and unique; enduring and transient; appropriate and inappropriate; flowing (connected ideas) and irregular (unconnected ideas); social and solitary (Snyder, 1984; Spivack, 1975).

Observational characteristics that should also be taken into consideration during the research are the movements of the individual accompanied by activity and verbal

comments inside the space, the selection and usage of the elements of the given task, the communication between the subject and the experimenter, and the gaze of the subject while searching for something in the environment (Noschis, 1982).

2.4.3. Creative Product

Creativity can most objectively be observed in production. The *product*, has been referred to in many theories of creativity that rely on a cognitive, associative basis of creativity as opposed to theories which place an unconscious state of mind as the origin for creative behavior. In order to be creative, the characteristics of the product must be accepted by others with an active involvement in the same area of creative endeavor (Folds, 1998; Sautter, 1994; Simonton as cited in McCann, 1998). Thus, the task or topic becomes important as a critical factor in determining creativity (McCann, 1998).

Products, through analysis, give insights into the process and the personality of the individual who created them; thus, the investigation of the products becomes very important in creativity research. The studying of the product also enables us to get an idea of the process itself, and generalize certain characteristics that are common in these outcomes (Besemer and O'Quin, 1993; Marjoribanks, 1991). Moreover, it has been stated that the best way to study creativity and creative talent is through product analysis (Briskman and Ghiselin as cited in Besemer and O'Quin, 1993).

The role of the product is large in that, even though an individual can be creative without ever creating anything, the definition of creativity itself involves production. This

product is the resultant of the total of the creative process, and enables the assessment of the *creativity* of the process and the person (Bailin, 1994; Eysenck, 1996). Moreover, creativity involves production rather than the capacity to produce (McLaughlin, 1993). The educational implication, thus, would be that a focus of investigation is formed involving the creation of products, such as works of art, scientific theories, technological innovations, and solutions to social problems, from which a common character is established. This allows the investigation of the idea that creativity that allows for such production can be fostered (Bailin, 1994).

The product mentioned above is the *task* which is carried out in the art-classes in schools. It is important to define what characteristic an idea, or a work of art must possess in order to be called creative. “Appropriateness and novelty” are stated as the most general criteria. The idea must include a workable solution, in addition to being original. Elaborating on the first criterion, it can be stated that, only if a novel idea results in a “useful invention, a valid discovery, an emotional response through art or music, or some other accomplishment”, would it count as creative. The second criterion does not mean to state that creative ideas are only novel. Thus, a product may be called creative if “it represents a transformation, has aesthetic coherence and appeal, and/ or represents a new configuration or connection of ideas” (Feldhusen, 1995: 265). The ways in which creative ideas resemble old ideas are just as important as the ways in which they differ. Thus, one must examine how ideas are carried to the future, rather than how they break with the past (Ward et al., 1995).

Creative thinking is considered to be *task-specific*, and the assessment of the creativity of products of individuals is made by a consensus of persons who are qualified in the field (Haensly and Torrance, 1990; Trogler, 1972). The teachers are actually the persons which are the most reliable, according to this view. Therefore, with the help of the teachers the type of task, the processes gone through in order to create the activity, and the evaluation which are of utmost importance in the creativity process during the art-classes in the schools are evaluated. Thus, trying to adopt a task-specific view of the skills underlying creative performance is very important. Although, divergent thinking skills do not occur in vacuum, the task and the means by which the task is handled are significant during the creative activity (Baer, 1993a).

The task set is also very important and should demand that everyone join in if all the students are to be successful. A preliminary analysis of the task enables to understand the nature of the outcomes and the factors influencing the outcomes. It should not be forgotten that, the nature of the task, the people involved in the process, and the environment have influences on the results of the task to be solved (Isaksen et al., 1993b).

The purpose of studying the creative product of a child must be decided at the beginning of the study. The question of whether it is being done for our own purpose of understanding and gaining insight into the child's growth and the influences which are exerted on his experiences, emotions, and his interest; or the purpose of showing her/him his strengths, weaknesses, creative abilities, his skillfulness, or his lack of skill

(Lowenfeld, 1975). What should actually be done is, first to gain insight and to understand the factors influencing the child's growth, then to use this understanding to manipulate the environment for the advantage of supporting the child in every way possible.

Studying the creative product characterizes certain variables that distinguish the products that are more creative from ones that are less creative, as perceived by different people for different purposes (Isaksen et al., 1993b). Until recently, the role of product in the field of creativity has been underestimated; however, the aim of studying creativity is to obtain more effective and creative products and outcomes. Thus, the focus should not be shifted to other areas. Moreover, the importance of the product in giving us clues about the creative process and the individual, in addition to the interactions between influential characteristics should not be forgotten (Firestien, 1993).

Although there is no one single definition of a creative product, as there is none for creativity, certain characteristics can be identified in the works of creative individuals (Firestien, 1993). The analysis of creative products, and the investigation of what characteristics make them different from more mundane products can be considered the base for studies in the field of creativity (MacKinnon as cited in Firestien, 1993; Wechsler, 1993).

In life, achievements are generally accepted as belonging to those who have followed certain rules, or have achieved the correct answers, rather than examining the problem

and the solutions from different points of view. However, an open outlook on tasks and how they are assessed may give clues about an individual's creativity which is actually more important in his present and future life (Fernald and Nickolenko, 1993).

The product should carry the following characteristics to be called *creative* (Besemer and O'Quin, 1993: 341-342):

- ❑ The product has novelty or value, is original, surprising, and germinal,
- ❑ The product is useful, even if it is so only for the person who has created it,
- ❑ The thinking is unconventional, necessitating the modification and/ or the rejection of habits and previous ideas,
- ❑ The thinking requires high motivation and persistence,
- ❑ The problem at the beginning was undefined, and thus, the task included the formulation of the problem,
- ❑ The product has a wise solution, makes sense, the idea allows being extended into the future, is mysterious, or unpredictable.

The tasks are assessed according to their novelty, resolution, elaboration and synthesis, usefulness, or completeness (Firestien, 1993; Isaksen et al., 1993b). *Novelty* is fundamental to a product in order to be called creative, and defines the originality that the product, or it being far from resembling any existing thing (McLaughlin, 1993), *resolution* defines how the product meets the needs of the stated problem, *elaboration*, and *synthesis* define characteristics of style. Finally, in the overall assessment, the product is evaluated according to how refined and developed it is at the end of the

creative activity duration (Firestien, 1993). The appreciation and evaluation of art can only be made through the evaluation of an individual product (McLaughlin, 1993).

The conceptual structure used in design consists of the *elements of design*, which are line, shape and form, space, texture, value, color, and light; *unifying principles of design*, which are repetition, variety, rhythm, balance, and emphasis. Concepts such as these are of critical importance in artistic expression and criticism. Art educators evaluate work in terms of these concepts and children learn to use them throughout the art education program (Michaelis et al., 1975).

The goal of construction of the task to be assessed is to produce a test that will measure a broader range of abilities than conventional tests would measure. The test should assess creative abilities, be liberally timed, so that power rather than speed of processing is emphasized, and be appropriate for students' level. Moreover, it should future creativity, be designed in a way that would ideally be engaging for the examinee, use tasks that would be meaningful and, thus, related to creativity in real-world settings (Nageotte, 1998).

2.4.4. Creative Environment – An Environment Supportive of Creativity

Very little research has been done on the topic of the interaction of the environment and the rewards necessary to stimulate effective innovation (Joyce et al., 1998). However, how the subconscious draws on influences from the surrounding environment and culture is a very significant aspect to be considered in the task of designing the environment. In

particular, artists, designers, and individuals in the process of creating, slip between many modes of communication, media, analogies, and manufacture. In this respect, persons involved in the creative activity are divergent thinkers. Thus, they are in need of greater flexibility in their surrounding (Joyce et al., 1998; Strong et al., 1995).

With the environment being one of the most influential ones, creativity has many components and many potentially contributing factors and conditions affecting it (Guilford, 1968). The learning environment includes the totality of certain features such as, the *design and organization* of the learning environment, *instructional techniques*, and the quality of the *atmosphere*. Moreover, the equipment available, facilities, people and management should be supportive of the work, work assignments should be challenging, and the work attitudes should be cooperative (Hanson, 1985). Without the provision of all of these factors, the learning environment would remain inadequate (Michaelis et al., 1975). Thus, the idea should be to detect and enhance creative drive with the support of the environmental factors that are effective on creativity.

Three categories of environmental variables, *instructional techniques*, *materials*, and *space organization*, exist in the learning environment along with the whole design procedure (McKee and Witt as cited in Lackney, 1994). These variables and all components of the learning environment need to be understood, formulated, and studied, in order to find out why some students are more creative or successful than others, obtain a complete picture of the total setting, and how a learning environment should be designed to support creativity (Erwin, 1991; Moos, 1979).

2.4.4.1. Instructional Techniques

Although the aspects related to the physical setting are crucial in the relationship of the environment and the users, if teachers do not use instructional techniques to support the physical setting, in a way to enhance creativity, the space may not be used to the full advantage (Proshansky and Wolfe, 1974). Instructional techniques are very important in the opening of exciting possibilities for better ways of individualizing instruction and educating a larger proportion of people to a higher level (Torrance and Taylor, as cited in Torrance, 1970). Besides, “Teaching methods and instructional systems substantially affect how much students learn” (Walberg, 1991: 95). Hence, Abbs (1989) claims that, it is important for the teacher to establish the link between teaching the necessary curriculum and supporting the creative process by allowing wild and crazy ideas to surface during the creative activity, without judging and controlling it. The goal is to establish a background of supportive and aesthetic character, within which creativity can grow.

Children can become more creative with the provision of instructional methods that focus on the complex nature of creativity, and that allows them to take an active role in turning the taught material into knowledge (Weinstein, 1996). Creative achievement is enhanced if students are freed to use their creative thinking abilities. However, when teachers insist that they learn by authority, little creative achievement can be seen (Torrance, 1970). Moreover, not only the process of creativity or creative strategy, but also the emotions felt before and after the creative strategies or activities should be recognized by the students. In general, students may easily think that they are not creative, and may feel

reluctant to engage in creative activities, however, students should be treated keeping in mind that under optimal conditions, all children can become creative (Antonietti, 1997; Gundry and Kickul, 1996). The teacher should allow for “complete and unconditional refrainment from judgement”, “crazy ideas”, “maximum possible number of ideas to come out”, letting “ideas trigger ideas and combine ideas for new ones” (Denel, 1981: 11). This is necessary as it is easier to move from these crazy ideas to the rational rather than the opposite (Denel, 1981: 11).

As creativity is a “modifiable, deliberate process that exists to some degree in each of us” (Ford and Harris as cited in Gilbert and Penshaw, 1996: 3), methods must be found to enhance, increase, and develop individual skills. Moreover, instruction in creativity is thought to lead to increased innovation (Farnham as cited in Gilbert and Penshaw, 1996), and a teacher who becomes a facilitator rather than an information provider may support the student in becoming a learner for life (Commentary, 1998; Short and Greer, 1994; What Makes Outstanding Projects, 1996). This is because the students’ success and creativity are directly related to the techniques the teacher uses, the rate of communication, and factors related to the environment (Cafoğlu, 1992; Wubbels et al., 1997). Furthermore, it has been found that creativity *does* improve with training (Gorbon and Zemke; Gilbert, Penshaw, and Ivy as cited in Gilbert and Penshaw, 1996). Although this is so, there are no easy and quick ways to increase creativity. However, it is important to see the influences of developing principles that will result in creative work for childrearing, school environments, work environments, and adult lifestyles which help in the development of abilities over time (Russ, 1993). What is significant at this

point is to define these principles, the extent at which the anticipated improvement takes place, and the methods by which this could be done and used for the well-being of individuals.

Classrooms and classroom-activities can be modified in several ways to support children's emerging creativity. This can be done in a number of ways (Albert, 1990; Michaelis et al., 1975):

- ❑ Class schedules should provide children with time to explore.
- ❑ Children should not be hurried from one activity to another.
- ❑ Teachers can provide children with different collections of resource materials that might be found, bought, or recycled.
- ❑ Teachers should respect, encourage honest expression art-work and recognize that, in art education activities, the experiences of the creative process are as significant as the product.
- ❑ Learning environments should inspire them. Students' work is fostered by a space that has the right physical conditions such as, natural light, harmonious colors, and comfortable work areas.
- ❑ The classroom atmosphere should reflect the adults' encouragement and acceptance of mistakes, risk-taking, innovation, and uniqueness, along with a certain amount of mess, noise, and freedom.
- ❑ The child should be allowed to experience emotions such as anger, joy, love, and passion in the learning environment. Such emotions are the basis for creative

activity and attached to fantasies which lead to creative processes, and thus, products.

❑ Involvement rather than techniques should be supported, and be accepted by the teacher.

❑ It is important to let the students learn to figure out solutions to problems, rather than to teach them the techniques of how to achieve the desired results.

❑ Novelty and flexibility should be supported in the learning environment, and it should not be forgotten that this is only possible if the teacher is open to error, surprise, and experience.

❑ Finally, it is important to remember that the best learning and teaching occurs when both student and teacher interact with each other, and give each other chances instead of imitating each other.

In any learning environment and especially in the art-room, the students' interest and curiosity should be considered the base of the learning process (Guilford, 1976; Proshansky and Wolfe, 1974; Trogler, 1972). Three conditions stated by Proshansky and Wolfe should be satisfied (1974: 621):

1. The materials should be accessible, so that the children can choose materials without using the teacher as a mediator,
2. There has to be adequate space for a particular activity so that the children are not frustrated once they have made a self-initiating attempt,
3. The children should be able to work without being distracted, in order to follow through something they have begun.

An environment that supports creativity can be created by providing encounters between students and their inner and outer world. However, first of all, teachers should give themselves permission to try and deeply engage in creative and artistic activity (Edwards and Springate, 1995; Short and Greer, 1994), and support relations between the students in a way to enhance creativity, as these interactions have great impact on creativity.

The pressure of the teacher and the interactions between classmates can undermine creativity in classrooms. The tendency for children to conform with their peers may reduce children's willingness to take risks in exploring new methods and solutions.

Moreover, the need to be accepted by classmates may also call for less activity in the classroom, in fear of making mistakes and being made fun of (Amabile, 1996). If this fear is not taken out of the children, it is carried to adulthood (Hanson, 1985). Thus, children should be supported in communicating their ideas however ridiculous they are. The teacher must provide the students with self-courage necessary for creative thinking to flourish by supplying the knowledge to transform, the belief in her/his power to create, the recognition of the importance of creativity in everyday life (Gilbert and Penshaw, 1996), and a nurturing environment in which the mind can be creative. In an environment as such, the students have the courage to make mistakes and remember what is being taught (Cafoğlu, 1992; Gundry and Kickul, 1996).

In the learning environment, the students should be left to their own will in their activities, and ideas should be dwelled upon and discussed from different points of view without restrictions. The students' excitement should be kept in balance with the teacher's teaching methods. Support should be given to the students in the activities they

choose to pursue. The students should be taught to observe their surroundings and become involved in their environments. Art activities should be enhanced, supported, and be given utmost attention (Gönen and Buluç, 1997).

The factors that inhibit the development of creativity in the art-room, on the other hand, are; lack of attention, communication, and tolerance for the curiosity and questions of the student, guidance to find the new; behavior of the teacher leading the child to copying, discipline, one answered expectancies, and adult-like reactions; lack of tolerance for the natural behavior of the student, use of different material for different uses than the expected, investigation, and freedom in their area of interest (Jones, 1993; American Montessori Society, 1998b); sexist, authoritative, excessively logical behavior of the teacher; the students' development being controlled by a certain, single, and shallow understanding of life (Gönen and Buluç, 1997). These are the factors which hinder the creative process and prevent it from resulting in creative art-work.

Students, as they begin to trust the instructor and the environment in which they are in, become more flexible thinkers, more creative, and more humorous. Thus, the use of the environment and effective material are very important during the process of facilitating certain skills, such as growth of human intellect, intelligent decision making, problem solving, and creative thinking (Fogarty, 1998; Russ, 1993). If these skills are taught by trying to the improve student thinking and to explore new perspectives, achievement is likely to be seen in the general situation of the students (Yıldırım, 1996).

2.4.4.2. The Materials

Two types of materials exist side by side in a learning environment; the materials provided to the children for use in their work, and the materials used in the design of their spaces. A careful choice is necessary for both kinds of materials in the learning environment.

2.4.4.2.1. The Materials Provided to the Students

Another influential factor on the creativity and skills of children in the art-room environment, is the variety of materials provided. Students should be able to choose from a wide range of materials as even the most skillful child will become discouraged trying to express her/himself with inappropriate or inadequate means. In order to guide the child in his desires for using a particular material for his expression, two points of view may be adopted. They are; the general suitability of the material, and the specific way in which the student uses a material (Lowenfeld, 1975; Trogler, 1972).

Each child has preferences and a unique way of using certain material. The intention of the child should match the materials used and the product itself, in order to be considered as a successful art-work. This means that the material should be an integral part of the creative work, and should not restrict the child in any way that the child can not make what s/he wants to. Most often in art-rooms, the students learn techniques and materials without experimentation, and this is inevitably an intimidating procedure and forces the expressive and creative drive out of the students, as they can not experiment on the capabilities of the materials (Lowenfeld, 1975). Watercolors, oilpaint, pencils, crayons,

and the like may be used for two-dimensional work, and clay, plaster, dough, strings, scrap material may be used for three-dimensional ones.

The storage and display of these works are important, and there is a need for carefully planned spaces for these purposes. Shelves of different sizes, open and closed drawers, wall panels, and cupboards are necessary in these spaces, in addition to working units, and sinks. Furthermore, separate spaces are needed for the drying and storage of the ceramic and clay works.

2.4.4.2.2. The Furniture and Equipment Used in the Art-Room Environment

Idea resources are significant for creative art processes to take place. Thus, one of the most important elements of an art-room is the resource corner (Barnes, 1993). A resource corner may consist of shelves containing boxes, or drawers that include a wide range of art-materials as well as inspiration sources such as art-books, reproductions, or objects from nature.

Displays are as important as any element in the art-room. This is so because there is a correct way of showing art-work with the appropriate differences in display of two and three-dimensional work. While billboard type elements could be used for two-dimensional work, shelves could be used for three-dimensional work. Different heights should be considered in the display of three-dimensional work with various sizes. Moreover, in display both two and three-dimensional work, the background should be

taken into consideration as it should not distract the viewers' eye from the art-work (Barnes, 1993).

In an art-room, there should be no discrimination between the children's art-work. However, an important aspect to be careful about in the displays of two and three-dimensional work is that overcrowding should be avoided in order to be able to focus on different art-works, but not see a mess of material (Barnes, 1993). It is also significant to obey the principles of design that the children learn in the art-room, in the organization of the displays along with the total of the art-room.

Heat insulation should be considered on the ceiling and walls in the ceramic area with the ceramic drying and oven spaces. The flooring, wall, and ceiling material should be resistant to fire and easily cleaned. This space should allow for separate use from the art-room itself. Moreover, the finishings, doors and windows should be designed according to specified standards, and the flooring should be of non-slip, resilient material with water insulation and drains. The counter tops should be of easily cleaned, durable material which may not be cut or dented by the students. Natural lighting is an important factor especially in these spaces, thus, the space should allow for interaction with the exterior by means of windows in addition to doors (Bingler, 1998). However, sunlight shining into the room can result in glare, or excessive light inside the space, and so, each window should have two window coverings to provide a range of light control and the assurance that if one device malfunctions, the teacher still has an alternative (Windel International/ Weyel, 1998c). As artificial lighting, can have substantial effects on the

students' physical and mental health, the lighting fixtures should not be disturbing to the eye (Adamson, 1998). Moreover, the need to increase reliance on artificial lighting may emerge, to supplement the daylight and to illuminate areas that do not get natural lighting (Sternberg, 1995-1996). Another factor in the art-room is that the quality of light should not reduce the effects of the colors or materials used in the art activities. Flexibility in the learning environment necessitates the need for flexibility in artificial lighting, which allows new organizations and layouts (Ahrentzen as cited in Lackney, 1994).

In the art-room, ambient sound should be reduced with quiet ventilation and generous use of sound absorbing materials prevent the noise from reaching the exterior of the art-room, and allowing the students to make an acceptable amount of noise while they are creating (Windel International/ Weyel, 1998b). Carpeting, acoustical ceiling treatment, sound absorption panels, and sound-absorbing fabric below chair rails are helpful in minimizing unwanted noise in the art-room. Moreover, the ventilation inside the art-room is very important as there are several types of toxic and chemical material used. Thus, good air-conditioning and circulation is necessary for these environments (Windel International/ Weyel, 1998b).

When the optimum areas are considered for these spaces, 96 m² are needed for 36 students in the art-room, 8 m² for the ceramic oven and 8 m² for the storage of the ceramic works. Finally, the art-room should allow a flexible organization of the working units, in order to provide the necessary working conditions for each individual student (Ministry of National Education of Turkey, 1997).

One should not forget that the learning environment is a place for everyone to live and learn in, thus, aesthetics, proportions, and the character of the atmosphere should be kept in mind when designing these spaces (Bingler, 1998). Lighting, colors, texture, communication patterns, and design elements that provide comfort, safety, satisfaction, and pleasure are the features that should also be dwelled upon (MacKenzie, 1989).

2.4.4.3. Space Organization

Apart from the creative and effective use of materials in the art-room, the storage and the maintenance of the materials is also quite important and should be considered in the design of the space. Too often a teacher will spend so much time in keeping the materials clean and in place that s/he will have little time to spend on the discussion and evaluation of the art-work of the students. Having the students help in the cleaning and tidying of the space, and having them handle some of the responsibility of dealing with the materials will free the teacher of the routine cleaning up. It will also help the students to see the art activity as a total process with time spent before and after the activity (Carey, 1995).

These factors can work to support the physical characteristics of the art-room that are the most significant factors effecting creativity, and the focus of this research. The environment can support creativity by displaying some of the knowledge necessary for a creative process to take place, instead of forcing individuals to store all knowledge in their minds. This is useful, as creativity involves being reminded of the right thing at the right time among other factors (Fischer, 1993; Kohn, 1996). Characteristics of the

environment facilitate or inhibit creative performance (Feldhusen, 1995; Isaksen et al., 1993b).

The effects of the physical environment on student outcomes may be summarized in three different domains according to Moore and Lackney (1994: 20):

1. independent factors: physical environment factors (e.g., design characteristics of the learning environment), and the socio-organizational environment (e.g., teaching practices, classroom management),
2. mediational factors: behavioral (e.g., student-teacher relations), and attitudinal (e.g., teacher's instructional techniques),
3. educational outcomes: achievement (e.g., mathematics achievement scores), and prosocial (creativity nonachievement scores) behavioral outcomes (e.g., improved creativity as a result of improved self-identification).

A learning environment is actually a place where the educational needs -which are present at the time of creation- are reflected. Undoubtedly these needs will change in time, and therefore, the environment should adapt and move at the same pace as the changes. The space should possess the flexibility to allow changing needs, and a variety of learning styles. This characteristic of the learning environment will also promote culture, creativity and competence, and exchanging needs and experience (Colven, 1990; Pantano, 1999).

Factors related to the environment can be defined in terms of physical factors, or a combination of physical and social factors, and can have large effects on individuals (Walsh and Betz, 1995). According to various research, (Amabile, 1990; Lackney, 1994) the learning environment, may be influential on social and personal development of the users, their behavior, their performance, and learning and learningstyles (Edwards and Hathway as cited in Lackney, 1994; Moos as cited in Erwin, 1991). Environments influence people in ways they may not be aware of, and activities may be enhanced by changes in the environment (Antoniades, 1992; Barton and Mishkin, 1984; Hebert, 1998; Hopkins, 1993; Nielsen and Kirk, 1974; Propst, 1975). Moreover, the effectiveness of the educational process, including teaching and learning is determined by the effectiveness of the physical environment (Moore and Lackney, 1994). The physical environment can be manipulated in order to achieve rewarding physical results (Moore and Lackney, 1994). Modification of the physical environment is today seen as a tool for facilitating improvement in the users, and thus, may be used to the advantage of the total well-being of the environment (Moore and Lackney, 1994).

It may be stated that a person's knowledge about his environment will bring about certain reactions from which predictions may be made, and so, research on the impact of the environment on its inhabitants is very important (Moore and Lackney, 1994). Children are especially very sensitive to their environments, and can easily absorb and learn from their environment (American Montessori Society, 1998a). Moreover, physical design has influences on the psychologies and behavior of students, in addition to affecting students' moods, performances, participation, group-work skills, self-concept, sense of

responsibility, belongingness, motivation, well-being, and development, in addition to learning styles which may contribute to an improvement in creativity in the learning environment, as some environments tend to motivate students more than others (Arends, 1991; George, 1995; Hebert, 1998; Lackney, 1994; Meagher, 1990; Moore, 1994; Raudenbush, 1990; Slabbert, 1994; Stone and English, 1998). Students tend to feel connected to an environment which understands their needs and acts upon them, seeing them as individuals (Hebert, 1998). The characteristics of the learning environment can have positive influences on the atmosphere of the learning environment or an inhibition to learning (Anderson and Walberg, 1974; Freiberg, 1998). Designing the environment in a way that facilitates creativity and the creative personality should be of primary concern in learning environments (Slabbert, 1994). These beliefs on the influences of the environment are proven empirically, and “are not just folklore” (Hebert, 1998: 69). Thus, it is important to take into consideration the impact of the design of environments which can help to create a “supportive and respectful” environment for students and teachers, as they spend most of their time in these environments (Hebert, 1998: 70).

Furthermore, academic achievement is also influenced by the physical environment (Fraser and Wubbels, 1995; Hawkins, 1997; Hebert, 1998; Moore and Lackney, 1994; Taylor, 1993). In addition, differences in the learning environments that students attend are more influential on their intellectual development than the differences in their home environments (Raudenbush, 1990). Reflecting on the influences of learning environments on students, Fraser (1991) states that, better results on several outcome measures have been found consistently in classes which are more cohesive, satisfactory, and state goals

clearly, and are less frictional. It is also interesting that, certain outcomes can be predicted from environmental characteristics, but not from personal ones; which make them all the more important (Moos, 1979). Aspects of the environment may be connected directly to the outcome, and satisfactory environments provide the base for activity (DeYoung, 1977; Walberg, 1991). They can promote growth, but can also harm the users (Moos, 1987). In general, cross-situational influences occur, that is, sequences of impacts occur. These could be used to the advantage after being studied elaborately (Abeson and Blacklow, 1971; Baird and Lutkus, 1982; Moos, 1987; Sallis et al., 1997).

Students need physical environments that stimulate them and show variation (Taylor and Vlastos as cited in Taylor, 1993), thus, the varied and flexible arrangement of the space and its management to support this, can facilitate the learning process, while the unplanned, unvaried, ineffective utilization of space can act as just the opposite (Baird and Lutkus, 1982; Proshansky and Wolfe, 1974). Impacts of the learning environment which are both direct and indirect can be seen in learning environment (Lackney, 1994). The research findings (Glass, Meyer, Pritchard and Moodie, Garbarino, Evans and Lovell, Johnson, as cited in Lackney, 1994; Moore and Lackney, 1994) show that a comfortable and attractive physical setting can be supportive of the goals of education such as creating and keeping the students' enthusiasm for learning, and encouraging social relationships. The space is an important influence in conducting structured and unstructured activities (Russ, 1993), and support creativity, independence, and other outcomes that are non-academic, in addition to the academic outcomes (Walberg as cited in Russ, 1993). As these humanistic goals are established, the positive attitudes of the

students may also reflect on creativity and achievement (Gardner as cited in Taylor, 1993; Lackney, 1994; Moore and Lackney, 1994).

When investigating the learning environment, there are certain significant aspects which should be taken into consideration such as, how one can create an environment that allows creative learning to take place; what spaces can be created which will give the teacher and the student alternatives for their use; provide stimulation, and support freedom; and in creating such an environment can we make it a place in which both teacher and student would enjoy working and learning (Abeson and Blacklow, 1971; Curtis and Smith, 1975; Gardner as cited in Taylor, 1993; Moore and Lackney, 1994).

There are several domains of factors of the environment, and the variables in these domains influence each other and jointly shape the individual's experience and outcome in a setting (Moos, 1984; Sallis et al., 1997). Furthermore, environments can be provided or chosen to capitalize on individuals' abilities or preferences, help them learn new skills, or compensate for what they can not do themselves (Cronbach and Snow as cited in Moos, 1987; Fraser and Fisher, 1983). The school environment is one that can foster creativity and inhibit creativity. Furthermore, among all social and environmental factors that may influence creativity, most can be found in some form in the classroom (Amabile, 1996). Therefore, the learning environment should be used to the advantage of the students in any way possible.

An important finding in supporting the importance of the quality of the learning environment is that, children use environmental scanning by looking for clues in the environment when answering questions to creativity tests (La Greca, as cited in Amabile, 1996). Apart from providing specific answers as such, a cue-rich environment may also “provide a level of cognitive stimulation necessary for subjects to engage their domain-relevant and creativity-relevant skills” (Amabile, 1996: 228). In a study where students endured 3 days of sensory deprivation (darkness and silence), their creativity test performance was poorer than that of controls (Amabile, 1996). The effects of cues in the physical environment may depend on the students’ ability to use them. With the necessary guidance and the correct environment, the students are likely to be happier and more creative.

Lowenfeld (1975) had a wonderful insight in the relationship between the environment and the creative activity, and it will be appropriate to continue this section with his words:

The atmosphere that is conducive to artistic expression, the environment that will foster inventiveness and exploration, is not the same type of atmosphere that is favorable for memorizing arithmetic tables. In the latter activity the student must concentrate on areas outside her/himself; s/he is dependent upon the teacher for recognition of her/his efforts and s/he, along with the rest of her/his classmates, must deny giving vent to her/his own feelings. Creative expression is the direct opposite of memorization. Where individual inventiveness, expression, and

independence of thinking are crucial, an entirely different classroom atmosphere needs to be established (85-86).

Flexibility, convenience, responsiveness, and mobility are the key issues in condensing this kind of environments (Academic Computing Consulting, 1998; Proshansky and Wolfe, 1974). Substantial achievement and will to experiment may happen in classes that dwell on the importance of warmth, creativity, and the motivation to learn (Hebert, 1998; Moos, 1987). Thus, the art-room should be a place where the individual expression is promoted and the student is not restricted to certain behavior, certain seats, certain working styles, and certain means of production (Holbein, 1998; Sternberg, 1995-1996).

Stimulation for independent and spontaneous thinking, curiosity, and self-expression should be the core of the art program. Flexibility in attitude and design will set up an environment which will make the student feel at ease and in comfort. This will inevitably help the flourishing of the artistic ability and creativity (Anderson, De Vito, Dyrli, Kellog, Kochendorfer, and Weigand as cited in Slabbert, 1994). Furthermore, since the development of artistic ability and the development of creative ability are interactive and can even be considered the same, the art-lesson should be organized so that it allows for maximum flexibility and freedom. A heterogenous setting as such has more diverse influences and provides each person with a wider choice of options. In order to support flexible thinking in students, and as teachers explore various teaching and learning styles, the environment must allow for the flexibility which these changes necessitate in the school environment (Commentary, 1998; The Top Ten Design Ideas for Schools of the

21st Century, 1998; Windel International/ Weyel, 1998a). The physical structure must provide for physical comfort and be satisfying, in addition to being responsive to the changing needs of the students and the teachers, as they learn (Harms, 1999; Moore and Lackney, 1994). It can be stated that the “physical organization” of a learning environment is shaped by values and decisions about the creative learning process and similarly defines how students learn (Moos, 1979).

Organizational factors also have influences on the students in the learning environments. Factors such as *size*, or *organization of desks*, are effective on the students’ behavior, achievement, creativity, and overall well-being (Moos, 1979). Size is effective on the type of social environment it creates, in that the formation of community, propriety, awareness, and scholarship are influenced (Segiovanni, 1995). Moreover, students in smaller groups are involved in a wider and changing selection of settings than students in larger ones, and this may have the possibility of being influential on the projects implemented in the art-room. As the size of the art-room gets smaller, it may be more difficult to involve in projects of greater size (Barker and Gump as cited in Moos, 1979). Thus, organizational features such as size can be influential on students’ will to compete with each other (Moos, 1979).

The elements that make up a learning environment are “complex, including such factors as heating, cooling, lighting”, safety, and furniture; and thus, the combinations of these elements should be given utmost attention, with the consideration of the feedback from their users (Freiberg, 1998: 24; Schwartz and Pollishuke, 1991). The correct use of some

of the significant materials used in the space are briefly defined below (Freiberg, 1998: 24):

1. Furniture: Chairs around tables facilitate interaction, whereas desks in rows all facing forward do not.
2. Walls: Walls which are covered with students' work and which show evidence for student collaboration, signs, exhibits, or lists created by students rather than the teacher, information about those who spend time in the classroom are considered as a *learner-centered* design. However, a learning environment with bare walls which are decorated with commercial posters, list of consequences for misbehavior, list of rules created by an adult, chart on which students are ranked, flawless student-work displayed on the walls, are not defined as a supportive environment.
1. Sounds: A space where frequent hum of activity and ideas being exchanged is a good learning environment, whereas frequent periods of silence and/ or teacher's voice the loudest or most often heard, is not.
2. Location of the Teacher: A space where the teacher works with students, so that it takes a moment to find him/her is considered a good environment, whereas a space where the teacher who stands front and center, is not.
3. Teacher's voice: A teacher whose voice is respectful, genuine, and warm is considered as a good one, whereas a controlling, and imperious voice, is not.
4. Students' Reaction to Visitors: Students who are welcoming, and eager to explain or demonstrate what they are doing are considered to be working in a good environment, whereas the ones who are unresponsive or hoping to be distracted from what they are doing, are not.

5. **Class Discussion:** Students who often address one another directly, who put emphasis on thoughtful exploration of complicated issues, who ask questions at least as often as the teacher does, are considered to be in a good environment, whereas the ones who wait to be called on to do anything, put emphasis on facts and right answers, race to be the first in answering the teacher's "Who can tell me?" questions, are not.
6. **Tasks:** Different activities which take place simultaneously are useful in the flourishing of creativity in a learning environment, whereas in classrooms where all students do the same thing creativity is not supported.
7. **Around the School:** Environments with an inviting atmosphere, students' work on walls, bathrooms in good condition, faculty lounge warm and comfortable, office staff who welcome toward visitors and students, students helping in lunchroom, library, and with other school functions are considered as good learning environments. However, environments which are stark and have the institutional feeling, where awards, trophies, and prizes displayed, suggesting emphasis on triumph rather than community are considered as not.

It should not be forgotten at this point that, "creativity blossoms and is somehow released in environments that do not impose certain behavior types on the students" (Cropley as cited in McCann, 1998: 2).

While teaching for creativity, it is important to state that, the learning environment should carry characteristics that optimally engage the brain. The environment has much more influence on brain development than previously thought, and optimal learning takes

place when the brain is appropriately challenged. However, when the learning challenge is too threatening, our brains are discouraged. Non-threatening ways are the best for challenging the brain, and a school environment which provides this factor makes use of art for teaching thinking and for building emotive expressiveness and memory (Bucko, 1998; Cheung and Petrie, 1998; Fogarty, 1998; Pool, 1997; Sloane, 1998). The human brain actually makes stronger connections to the environment when practicing visual arts; and result in better visual thinking, problem-solving, language, and creativity (Simmons cited in Cheung and Petrie, 1998). Inevitably, this is a two-way process, and an effective learning environment supports art and music programs with appropriate school facilities (Lockheed cited in Raw and Marjoribanks, 1991). Although these studies included the environmental factors from the architectural view, they generally concentrated on the social view leaving out factors belonging to the environment which have been built, such as the school environment or the classroom environment.

Most of the learning takes place in the schools, and here students learn about lessons of all kind and practice them. However, students may also learn about things which the teacher had not planned for them to learn. These are the results of the impact the environment has on the student (Haensly and Torrance, 1990; Gilbert and Penshaw, 1996; Ormrod, 1990; Fogarty, 1998; Sloane, 1998). The better we understand the factors that influence learning and the elaborate processes underneath, the better opportunity there will be to enhance whatever factor which will be to the advantage of the children, maximize learning, creativity, and ways of thinking in order to support later achievements (Ormrod, 1990).

Contribution of the student to activities in the art-room is an important factor having influence on creativity. "The more influence a person is able to exert on her/his surroundings, the more committed s/he becomes. One becomes attached to things only when one is able to relate to them, when so much of one's own effort and feeling has gone into them that they become one's own, incorporated into one's own world of experience" (Hertzberger, 1980: 38). When the goal is to enhance creativity in an environment, students should be encouraged to participate in the organization and the design of the learning environment, so that they can feel involved. Involvement promotes self-confidence which lies at the base of creativity (Hanson, 1985).

The creative environment has a particularly important role among these tools and processes that are necessary to be able to define and assess creativity. The learning environment should carry certain physical characteristics to support creativity. Two of the most prominent characteristics that are influential on creativity in the learning environment are, flexibility and grouping which are going to be utilized in the empirical study.

2.4.4.3.1. The Design and Organization of the Art-Room Environment

Art has a significant role in human development and education (Chapman, 1998; Eisner, 1992), and a learning environment in which art is absent, or to which little attention is paid, is unlikely to provide the opportunities necessary for children to be able to use art for their own development (Dean and Gross, 1992; Eisner, 1992; Godfrey, 1992; Hanna, 1992). Creative techniques used in art can help the students become more aware

of their environment, and “more conscious and receptive to their internal lives”, in addition to the improvement of “confidence in risk-taking” when making choices in life (Assumpcao and Rosas as cited in Wechsler, 1993: 117). Moreover, the children’s needs for creative expression, personal expression of experience, and understanding are satisfied through art (Edwards et al., 1991; Michaelis et al., 1975; Zeki, 1999).

Art is momentous, in that, spaces in which one can live in total freedom should be provided (Goldberg, 1992; Gönen and Buluç, 1997). By creating environments that include art-work as well as more scientific forms of learning, schools can allow students to *experience* taught information, and thus, learn to use and remember that information (Aschbacher, 1996; DeBono, 1993; Goldberg, 1992). Additionally, stimulation driven from the ideas of students can contribute to the improvement of the environment, as art is a language which teachers and students can use to communicate ideas and feelings. This can be done by providing freedom in the learning environment (Carey, 1995; Henri as cited in Godfrey, 1992; Rasmussen, 1998).

The art-room should carry certain characteristics that help efficient and creative working inside the space (Bingler, 1998; Moos, 1987). There are several things that can be done to enhance and improve the creative processes inherent in most people (Hanson, 1985). Using the advantages of the environment is one of the significant methods of carrying out this procedure. The most creative person may be forced to become uncreative in an environment that is impossible to live in, and the opposite is also true for a less creative

person (Hanson, 1985). *Flexibility* and *grouping* are two types of organizations in the learning environment that have impact on the creativity of students.

2.4.4.3.1.1. Flexibility in the Art-Room Environment

Education is an open and dynamic system that is successful as long as it is flexible enough to fulfill the requirements of the changing educational system (Ministry of National Education of Turkey, 1997). The flexibility in the education system is reflected upon the design and organization of the learning environments, thus, creating a flexible environment which allow for change as frequent as the users need it (Moore and Lackney, 1994). It is important as it is influential on improving the quality of the learning environment, which in turn can create an environment conducive to instruction, learning, and creativity (Lackney, 1994).

Flexibility refers to the ability of a learning environment to serve several purposes that are changing without altering the structure of the facility, and enables continuous change (Kowalski, 1989; Sternberg, 1995-1996). Flexibility permits variation in organization and activities in an environment without adaptation, and can be defined as small and frequent change. In order to be flexible, the learning environment has to be a space which can be changed frequently and immediately, which can easily serve several functions, which allows for organized growth, and which changes to adapt to program (Kowalski, 1989). A space should carry all these characteristics if it is to be flexible enough to become efficient.

Here, adaptability has to be explained: It is the quality of a building which enables alteration made to its design features, and can be defined as large and seldom change (Organisation for Economic Co-operation and Development, 1973; Organisation for Economic Co-operation and Development, 1975). It is a character enabling a space to allow varying purposes to take place within it, and does not necessitate redesign (Kowalski, 1989). Although the provision of flexibility in a learning environment may need extra thought and may cost more, it is certain that it will prove to be efficient and economical as needs are changed (Guilford, 1968; Isaksen et al., 1993b). Thus, “the greatest emphasis should be given to maximizing flexibility by providing excess of workplaces over the number of occupants, to widen the range of activities which general space can accommodate with mobile furniture and equipment, to widen the range of specialized workplaces in order to widen the range of opportunity, to optimize the proportion of general to committed space and to provide for easy conversion of specialized workplaces into basic workplaces or vice-versa rather than one kind of specialized into another” (Organisation for Economic Co-operation and Development, 1976: 108). These factors necessitate a plan which calls for “a continuum of activity zones punctuated or articulated with committed spaces and which is so dimensioned as to avoid complex lighting, ventilation, and circulation problems” (Organisation for Economic Co-operation and Development, 1976: 108; Moore and Lackney, 1994).

School buildings have to meet users’ needs, and evolve rapidly, and “unless the buildings can be made to accommodate future change, they are liable to early and costly

obsolescence” in addition to becoming outdated buildings which do not satisfy their users’ needs. There are two major types of changes in schools; the first is linked to the “variations and evolution of the population inside the schools and their needs”, and the second is linked to the “evolution of teaching/ learning practices and activities” (Organisation for Economic Co-operation and Development, 1976: 109-110). Both are very important and should be taken into consideration in the design and organization of schools.

Flexibility should be achieved to allow for the many different learning strategies of students, inside the learning environment which provides for the different arrangements, as every brain is uniquely organized (Pool, 1997). Thus, the flexibility inside a learning environment “accommodates changing needs of children” (Domenech, 1999).

An art-room should be flexible, accessible, and useable to provide for a dynamic and exciting setting for learning and experimenting. The flexible character of work and study spaces, and the accessibility of the environment and its facilities, materials and equipment by the students, form the base for a productive setting (Michaelis et al., 1975). Bulletin boards, display areas, equipment, and furniture should be designed and organized taking into consideration both the teachers and the students. Moreover, *health*, *safety*, and *welfare* of the students are the considerations in planning an environment, in addition to the provision of standards to guide children’s use of them or students’ use (Michaelis et al., 1975).

2.4.4.3.1.2. Grouping in the Art-Room Environment

Although physical environments are the least studied potential determinants of movement and activity inside the classroom, it is important to understand the possible effects as environmental characteristics may influence large populations in several ways (Sallis et al., 1997). Grouping emerges as an organizational device, and in a learning environment designed according to grouping, communication is enhanced with the contributions of everyone included in the group (Slavin as cited in Burgess, 1998). There are arguments favoring both working in groups, and individual work. However, the most favored idea is that students should work individually, supporting their work and exchanging ideas with other students in groups from time to time.

Grouping can help students learn by reflection of ideas inside the group (Burgess, 1998; Fatt, 1998; Smith, 1998; Wasserstein, 1995). Studies on groups show that there are negative correlations between size of the learning environment and, group sizes and satisfaction (Achilles, 1996; Thomas and Fink as cited in Walberg, 1969). Smaller work groups result in higher individual satisfaction in that communication, cooperation, and support inside the group are enhanced, undoubtedly by the provision of enough room for both group and individual work inside the learning environment (Walberg, 1969).

The importance of grouping is that individuals generally enjoy working in groups and feel that they have achieved more than they actually have. Although group work is slow, there are advantages that individual work does not provide. Groups may be advantageous once an idea has been initiated, as several ideas emerge from different people which

usually jump start other useful ideas (DeBono, 1993). However, for efficient results, a group which works in cooperation, and an environment which supports the cooperation inside the group, is necessary.

The group should consist of students who can get along well, as the value of the task may diminish -and this may effect the motivation necessary for creativity- for one or more group member, especially if the group is formed according to previously identified strengths of the individuals within it (Burgess, 1998). In addition, group organization in the classroom may have impacts on the choices of friends and relations between the students (Jacklin and Lacey, 1997; Rose, 1990). Thus, if the learning environment is designed according to grouping, the members of the group should be chosen and assessed very carefully.

Depending on the task, the student may or may not want to participate in groups. The student will also work more efficiently in environments where s/he feels her/his ideas and desires are supported (Torrance, 1970). Therefore, the student should be left to her/is own method of work with guidance when needed. This method of work is the learning method or strategy, and refers to the choices and preferences of each individual child in dealing with a task (Entwistle, 1991).

Although grouping is a useful method in several situations, simply telling students to work together may not create cooperation within the group (Johnson and Johnson, 1991). There are several possible reasons why grouping may not work, such as less able students

leaving work to the more able ones, the more able students may do less work just so s/he does not feel like s/he is not doing *all* the work, the more able students may take over the group in ways that would benefit them at the expense of the other members, or the more able students may give away all the answers and leave the other members without the effort to learn. However, positive relationships, support, togetherness, acting as a team, cooperation, are all for the benefit of the students. If the groups are organized regarding the capabilities and the characteristics of the students, there is no reason for group-work to not enhance any learning activity in the learning environment (Johnson and Johnson, 1991).



3. CREATIVITY IN THE ART-ROOM: THE CASES OF ERKEN BAŞARI ELEMENTARY SCHOOL AND BİLKENT UNIVERSITY PREPARATORY SCHOOL

This chapter analyzes the characteristics of the case study, the settings, sample group, research methods, as well as the results and discussion of the results of the study.

3.1. Definition of the Case Study

The significance of associations between student outcomes and the learning environment have long occupied the minds of designers and educators, however, research on the topic is only recent (Cheung and Petrie, 1998; Edwards and Springate, 1995; Fraser, 1991; Freiberg, 1998; Hawkins, 1997; Hebert, 1998; Moore and Lackney, 1994; Taylor, 1993; Walberg, 1991). The present study examines associations between creativity and the learning environment in the art-room.

The research question was to investigate whether the general well-being of students in the art-room with the help of the design and organization of the environment, or not. To test the effects of the learning environment on creativity, two art-rooms were chosen from two different schools with similar curricula, and which had students coming from similar socio-economic backgrounds. These two sixth grade student groups were assessed according to the four components defining creativity – the creative person, product, process, and the environment (see Section 2.4).

3.1.1. The Settings

The research was conducted at two schools, namely, Erken Başarı Elementary School (EB) and Bilkent University Preparatory School (BUPS) of Ankara, Turkey. The art-rooms of these private schools were chosen because of their individual characteristics, that is, the art-room in EB focused on the idea of *flexibility* inside the art-room whereas BUPS focused on the idea of *grouping*. The characteristics of the schools and families were investigated and found to be quite similar, in that they were both private schools with certain individual characteristics, and the families of the children attending these schools were of similar socioeconomic condition.

The curricula of art of these schools were not traditional, in that they learned about the principles and elements of design in their art classes, unlike most schools in Turkey. In both of the schools, art classes were carried out in different spaces than the students' regular classrooms. In most schools, the classroom is the space that is used for art facilities among other lessons, however, in these two schools, a separate space was allocated for the fine arts activities. This is important as a separate space especially designed for art signifies for its users the role and importance of art for a school.

Although the art-room in BUPS is larger than the one in EB, the area of work -excluding the teacher's office, study space, and storage in BUPS- in the two art-rooms are similar. These similarities between the schools were important in their being chosen.

3.1.1.1. Setting I: Erken Başarı Elementary School

The first school that the research was conducted in was EB, situated in the city centrum of Ankara. It is a small private school to which children from high-income families attend.

The art-room in EB is a space that had previously been a porch, but had later been renovated to be an art-room. In order to include the space to the school, glass has been used to cover the roof, and the walls, which makes the space look like a greenhouse. It is a space that overlooks the garden of the school and has two doors – one directly accessible from the garden and the other that is connected to the school building. The space takes in plenty of light as it is surrounded by windows (see Figures 3.1, 3.2, 3.3, 3.4).

The art-room environment is designed according to the idea of *flexibility* (see Section 3.1.1). Although the room is quite small, the size has not limited its use as a very flexible space. There are 11 tables (60x90 cm.) in the art-room, and each table allows a maximum of four students to work. The tables are of a size permitting arrangements for both grouping and individual work. There is no special furniture for the teacher, only a table of the same size as the ones for the students with the exception of a chair instead of a stool. The similar seating conditions for the teacher and students emphasize equality within the space. The children are allowed to move around in the space and this strengthens their relationships with other students.

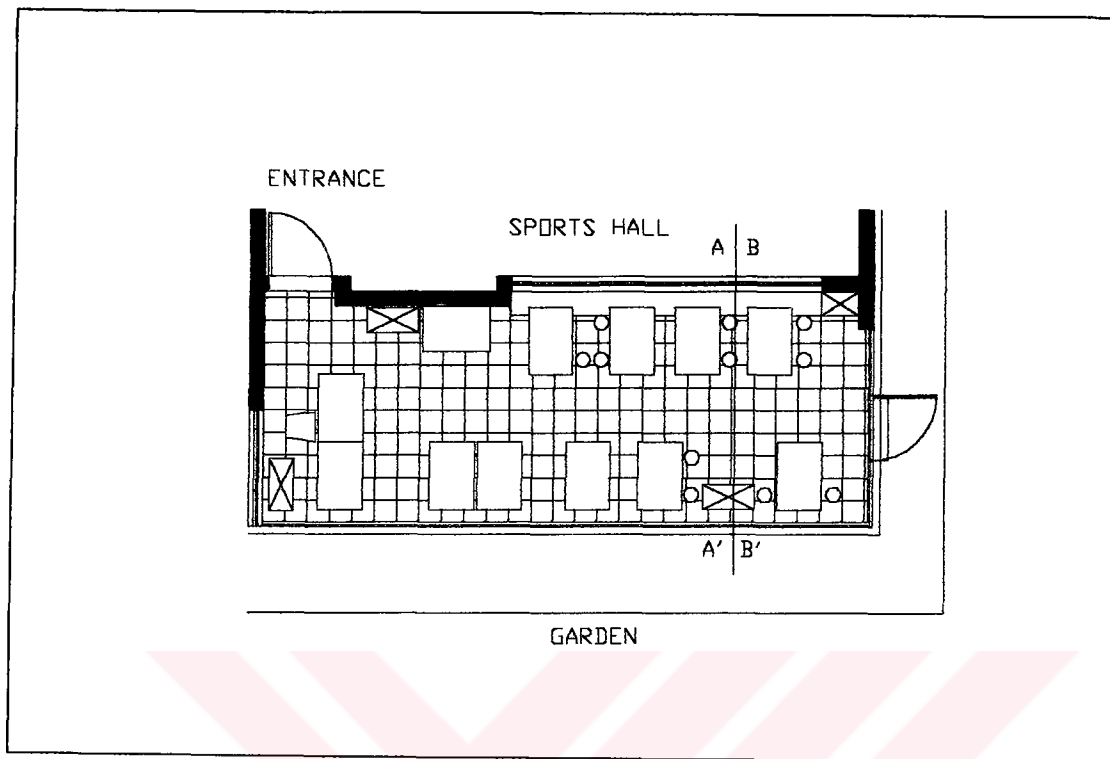


Figure 3.1. Plan of the Art-Room in EB

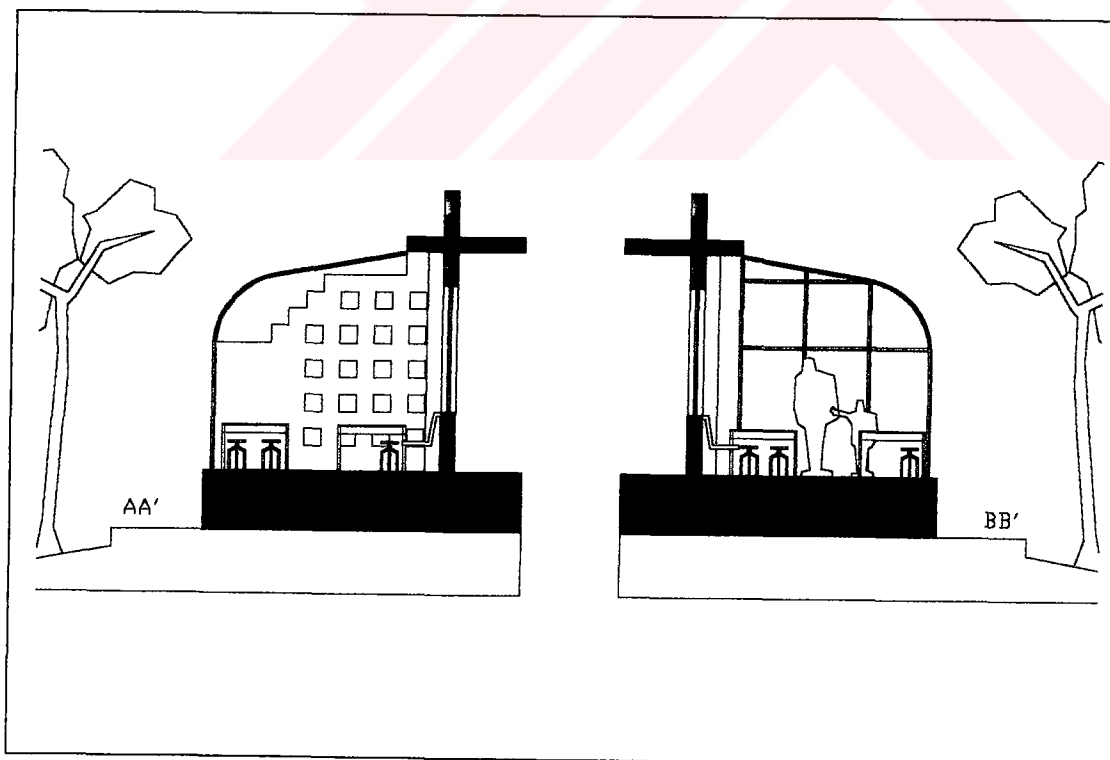


Figure 3.2. Section of the Art-Room in EB



Figure 3.3. View 1 from the Art-Room in EB



Figure 3.4. View 2 from the Art-Room in EB

The storage of material is made in individual movable units, and the display of two-dimensional art-work is made on the windows of the room, and in a central place on bulletin boards, walls, and a few tables at the entrance of the school. The problem of not being able to include fixed shelves, better storage, and displays for art-works with different characteristics arises from the size of the art-room, which has been solved by using some of the space inside the school as an extension to the room.

3.1.1.2. Setting II: Bilkent University Preparatory School

The second school that the research was conducted in was BUPS, a large school on the campus of Bilkent University in Ankara. Being inside the campus and being connected to the University, the parents of children who attend this school are mostly academics. There are also children from high-income families.

The art-room in BUPS is a space that views the playground of the school, and connected to it with a door. The art-room is accessed by a second door that is more frequently used than the other, from inside the school. The space takes in plenty of light with the help of the large windows overlooking the playground.

The art-room in BUPS is much larger compared to EB, and concentrates on the idea of *grouping*. However, although the space is quite large, the space used by the students while working is the area that surrounds the tables. The organization of the space is not flexible as the location of the furniture inside the space is not changed in spite of the largeness of the space (see Figures 3.5, 3.6, 3.7, 3.8). Most of the furniture -except tables-



Figure 3.3. View 1 from the Art-Room in EB



Figure 3.4. View 2 from the Art-Room in EB

tables- inside the space, such as counters, shelves, and storage are fixed. There are six tables (90x180 cm.) that are put together in groups of two to support group work. Group work and conversation are especially supported in the art-room because of one of the aims of the school being teaching English.

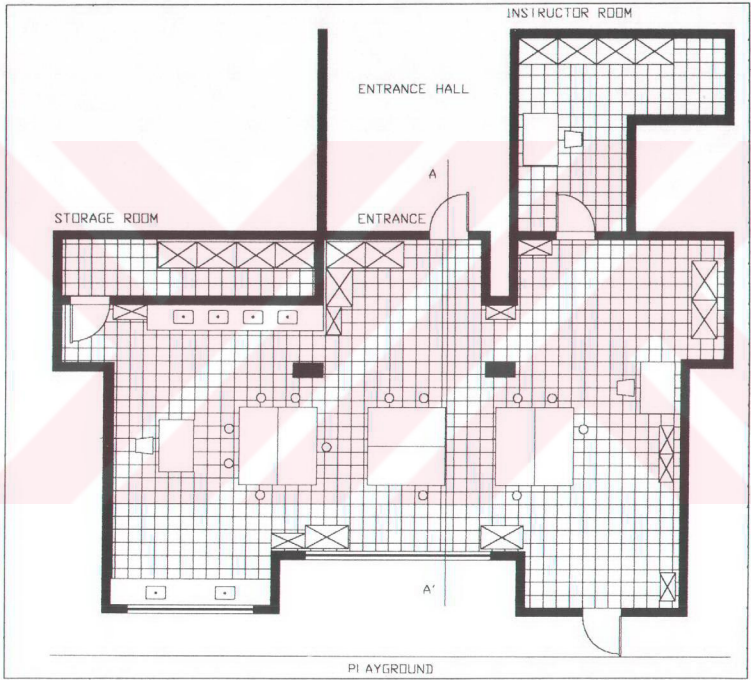


Figure 3.5. Plan of the Art-Room in BUPS

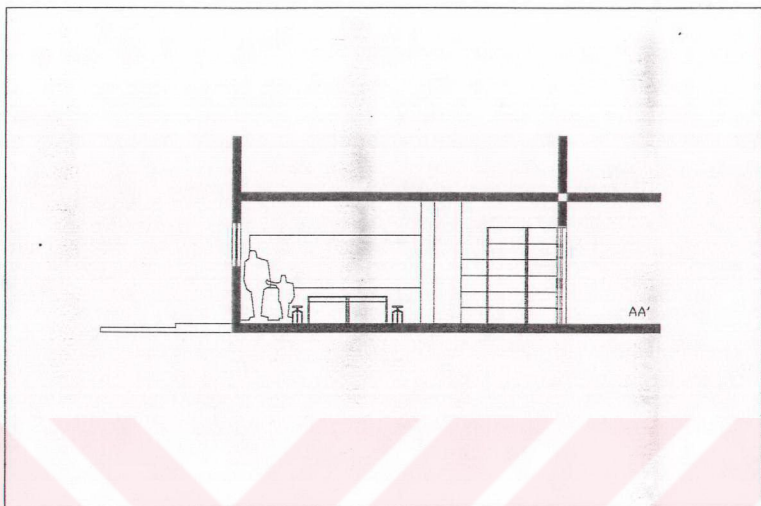


Figure 3.6. Section of the Art-Room in BUPS



Figure 3.7. View 1 from the Art-Room in BUPS



Figure 3.8. View 2 from the Art-Room in BUPs

The spaciousness has advantages such as providing different areas for displays, large storage areas, and counters with sinks to keep the art-room clean. Because this room has the necessary furniture to keep the environment clean, the chances of involving in work that involves getting dirty are higher. This is significant, as the opportunity of experiencing different activities, provides the base for creativity.

3.1.2. The Sample Group

The sample groups were selected by focused sampling as two art-classes of sixth graders. There were 24 students in total with 11 in EB and 13 in BUPs between the ages 10-12. This is a stage in which children are faced with a different, more formal learning environment. There are several differences in the learning environment before and after

the transition from fifth to sixth grade, and thus, the assessment of the creativity outcomes of the students who have just made this transition is very explanatory (Midgely et al., 1991). Although elementary school includes first to eighth grade, sixth grade still marks radical changes in many different ways. A difference as such in the environment makes it easier for the students to compare differences with the previous art-room, and thus, state their observations and feelings in the interviews.

Students at this age daydream more than the other age groups, and can understand abstract issues that are necessary for this activity, to an increasing degree (MacKenzie, 1989). These ages are the peak point of creativity. After this stage, creativity either stays at the same level or begins to diminish (Denel, 1981; Gönen and Buluç, 1997). The ages 11-14 in boys, and 10-13 in girls are the peak periods during which creativity is most likely to be worked on and developed (Dacey, 1989). There have been several discussions about the reasons for this decrease of creativity, as an individual gets older. The most plausible explanation is that, as one gets older and mature, one becomes more aware of the society's rules and several other features about the environment that detracts an individual from the creativity within. Moreover, parents and teachers wish for children to be both quiet and calm, and also creative and original (David, 1982; David and Wright, 1975). However, a child can not be creative under these circumstances, especially with the rules and regulations of the society becoming more rigid as an individual gets older (Gardner, 1985; Gönen and Buluç, 1997). Thus, after a certain age, an individual's mind no longer functions in the flexible, fluent, unstructured character of an earlier age (Gardner, 1982; Hanson, 1985). Additionally, following this age, the children go into a

stage in which they become sensitive to the qualities central to art, such as style, expressiveness, balance, and composition. Although the development of this sensitivity is a useful factor in the appreciation of art, it has the character of inhibiting creativity, as it brings upon certain rules and regulations (Gardner, 1982). Picasso sheds an explanatory insight into the subject, and states that he used to draw like Raphael, but that it took him a whole lifetime to re-learn to draw like a child does (cited in Gardner, 1982).

Sixth grade is an important age at which to observe creativity, as children begin experiencing new ways of seeing, which is reflected in their art-work. A shift of attention towards realism and involvement in information gathering with utmost care is seen in these ages. Moreover, there is a great deal of effort spent on trying to depict reality and trying to integrate emotions (Barnes, 1993). It is also the culmination of creativity and the age at which two and three-dimensional objects can be fully comprehended and thus, the shift from one dimension to the other can be made in art-work. There may be a confusion between planes, for example what should be drawn in elevation and what should be drawn in plan (Barnes, 1993). However, if the necessary explanations are made, the children can understand and reflect their knowledge to practice.

At the age span of sixth grade, the physical and the mental development is the fastest of any age group. This age can also be considered the peak point of capabilities in several tasks, compared to the other age groups. Children at this age have a tremendous ability to acquire new skills in art in short durations of time, and they enjoy doing so (Gardner, 1982). Moreover, the smaller a child is, the less probable it is that the child has been

hindered from creative thinking and activity, and thus, possibility of engaging in creative experiences. Because of several reasons such as the society's demands and rules, or the organization of the family, a child is likely to be influenced by the structured organizations and regulations in the environment, in addition to authoritative teaching. These factors may hinder the development of a child's identity, abilities, opportunities, and thus, the less the child will be willing to engage in any kind of challenging activity in her/his life (Albert, 1990).

In order to emphasize differences, the students and teachers who have just made the transition from fifth to sixth grade were selected as the sample group, because their perceptions in addition to the observer's may reveal more than research on other age groups, and correlations between students' outcomes and the characteristics of the learning environment are higher in samples of students who have made this transition (Fraser and Wubbels, 1995). Teachers were interviewed as they spend a great deal of time with the students observing and assessing them. Moreover, teachers can help to "present a balanced appraisal of the total setting" (David, 1982: 178), and they have the ability to point out facts that the students have forgotten, or have not been able to communicate clearly (Fraser, 1982). In addition to methods of *observation* and *questionnaires* with the students and teachers, *models* of the art-room were made to evaluate the characteristics of the creative individual, behavior traits of an individual in the creative process and the stages of the creative process, characteristics of a creative product, and an environment that stimulates creativity.

In order to find out the reasons and consequences of creativity before the child has been influenced a great deal by the rules and necessities of the society (Gardner, 1996), children have been chosen in the research. Teachers' and students' perceptions are significant in providing a perspective on learning environments, as they spend enough time inside the learning environment to be able to form accurate and durable impressions. Students are the "intended recipients of instruction and other cues in the learning environment", and thus, may be "the best judge of the learning context" (Anderson and Walberg, 1974: 86).

In order to understand and be able to compare the responses of the teachers and students, both were interviewed. Both points of view have to be utilized together in order to form a complete picture, as the perceived characteristics of a learning environment have been stated to have larger impact on the students' outcomes than the observed variables (Fraser and Wubbels, 1995; Johnson, et al., 1996). As students tend to identify with the environments they occupy -such as the art-rooms, which are more flexible and changeable and so can reveal several details- they should be consulted in addition to the teachers in any kind of research on learning environments (Moos, 1979).

3.2. The Research Methods

This section examines the analysis of the research methods used in the assessment of the creativity effects of the environment on children. Observations, questionnaires, and the building of 1/20 models of the art-room by the children were used to assess the creative *person, product, process*, and the *environment* necessary to fully grasp creativity. The

reason that the art-room has been used as a topic for the task was to see how the children would redesign a space that they continuously use, according to their preferences.

The assessment of the task was done according to the following factors:

1. *characteristics of creativity*, which are flexibility, fluency, novelty, originality, elaboration, ability to see deficiencies, ability to redefine, and ability to put forward open-ended solutions.
2. *elements of design*, which are line, shape and form, space, texture, value, color, and light.
3. *unifying principles of design*, which are repetition, variety, rhythm, balance, and emphasis.

The students were given three double sessions of 40 minutes each for the whole course of the activity. In the beginning, two sessions were given for the answering of the “person” and “environment” sections of the questionnaires and the planning phase of the activity, that is, the designing and drawing of the art-room. Two sessions (40 min.) were given for answering the “process” section of the questionnaires, finishing the drawings, and beginning the models. Finally, two sessions (40 min.) were given for finishing the models and answering the “product” section of the questionnaires (see Appendix A.1).

3.2.1. The Questionnaire

Two types of questionnaires were used in the research, the first type for the teachers and the second for the students. Each questionnaire was structured by questions related to the

person, process, product, and the environment. Questionnaires are helpful in obtaining “first-hand information from individuals who have expert knowledge on the topics under study” (Michaelis et al., 1975: 138), thus, teachers were also asked to answer the same questions. The questionnaires were constructed using parallel questions, that is, the same questions were asked to the students about themselves and the art-room environment, and the teachers about themselves, the students, and the art-room environment.

The questions were formed depending on the characteristics of creative individuals, their methods of working during the process, and the characteristics of a product, and environment identified as creative. The questions were then organized from the most general to the most personal in all sections.

The questions in the “person” section included questions on the originality, self-courage, sensitivity, capacity of completion of an activity, and negative characteristics. The questions in the “process” section included questions on originality, self-courage, completion, and need of isolation. The questions in the “product” section included questions on elaboration, originality, flexibility, fluency, usefulness, success, and identification with the product. Finally, the questions in the “environment” section included questions on flexibility in the environment, maintenance, design characteristics, isolation inside the environment, identification with the environment, personalization inside the environment, and ability to concentrate inside the environment.

The answers to the questionnaires were organized in a five-point scale format, from “not at all” to “very much”, and the respondents were asked to mark the most suitable one for them. One question in the “process section” (Question 8); three questions for students (Questions 9, 15, and 17), and one for the teacher (Question 9) in the “product section”; and one question for the students (Question 22), and two for the teacher (Questions 42 and 43) in the “environment section”, were essay questions in which the respondents were asked to clarify certain points (see Appendix A).

3.2.2. The Observation

Observation is the primary means of measuring process quality. It is accepted to give more knowledge on student outcomes than structural indicators such a staff to child ratio, group size, cost and type of care, although these too are influential on the students and their outcomes in the learning environment (Fraser and Fisher, 1983; Harms, 1999).

The observation method was used to evaluate the “person”, “process”, “product”, and the “environment” through the eyes of the observer. The behavior traits of the creative and non-creative individual in general and during the process, the characteristics of the creative and non-creative product, and the necessary characteristics of the environment in order to support and enhance creativity were used in the preparation of a list of binary descriptions. The description pairs of the person were checked before the activity, the process and environment during the activity, and the product after the activity (see Appendix B.1 and B.2).

The observed characteristics were compared to the answers to the questionnaires, as all items were also asked to the students and the teachers about each individual child. This enabled a complete understanding of each item to fulfill the purpose of the research.

3.2.3. The Task

In the selection of the kind of activity that the children would be participating in, a great amount of attention was given to the task being one that would combine the influences of the environment on individuals and the creativity of the child. Thus, a design-related activity was designed for the children to experience. A design-related project is one that primarily leads to three-dimensional work despite the focus on two-dimensional art until this age. Since, up to this date little attention had been given to three-dimensional (such as construction and model-making), design-related work in primary schools (Barnes, 1993), this was an activity that would involve the necessary conditions of this research and become an interesting one for the students and the teachers. Moreover, because much of the art-work done in primary schools has been “limited to flat drawings and paintings”, design-related activities such as model-making are new and exciting for students and also the teachers (Barnes, 1993: 145). This enabled an easy interaction with the sample groups, along with the condition of motivation for creativity to flourish in the children.

Moreover, three-dimensional art was especially chosen as an activity to establish the relationship between the environment and an art-work. Three-dimensional art consists of height and width as in two-dimensional art, with the addition of depth. Experiencing

depth can be very exciting for children. They are fascinated by the relationships of the “hollows and ridges” to each other, “gradations of light and shadow”, the “changing surface textures”, and the dynamic character of the created art-work (Zelanski and Fisher, 1987: 232). Between ages 8 and 13, children can grasp the third dimension quite well, and can make the transfer knowledge from two-dimensional to three-dimensional art (Barnes, 1993; Zelanski and Fisher, 1987). Moreover, three-dimensional art enables the viewer to experience the art-work from different angles, different lighting conditions, and to be walked around. Thus, it is very exciting for children who generally do not experience much more than two-dimensional art-work until about age 11, to actually create a two-dimensional art-work, then convert it into a three-dimensional object (Barnes, 1993).

In order to design the model, drawings, sketches, and plans were used as it is common in the planning stage of a three-dimensional art-work (Zelanski and Fisher, 1987). The students were asked to organize and contribute to the design of their art-room in two-dimensional form, then make a three-dimensional model of it. An existing situation was chosen to analyze the students’ ability to imagine the space as an empty shell in which they could make any architectural alteration, and if and how much they could get away from the existing design of the art-room. Moreover, this task was thought to not only be used for creativity assessment, but to be used as a reference for students’ preferences in working style inside the art-room.

In order to observe certain skills in a project, connections have to be made between one technique and another and one idea and another. Therefore, a start could be made by taking a two-dimensional idea and turning it into three-dimensions (Barnes, 1993). A three-dimensional work occupies two important dimensions for the viewer -space and time- thus, necessitates dense involvement and curiosity (Zelanski and Fisher, 1987). Furthermore, three-dimensional art stimulates the tactile and visual senses, and thus, includes the creator in the art-work and enhances *identification* of the artist with the art-work (Zelanski and Fisher, 1987). Since identification is one of the necessary components of a creative process, three-dimensional art-work has been chosen as a task in this research. Furthermore, the third dimension was necessary to understand the reflections of the on children's art.

The elements of design; and the unifying principles of design, has been used in addition to the necessary qualities that a creative product should have, in the assessment of the task. The process of working, handling of materials, use of media, and critical skills are important in evaluation (Barnes, 1993), and were taken into consideration in the assessment of this project. Furthermore, the relations between what was asked of the children and what they came up with, elaboration on the theme on which they are working on, the emotions evoked by the process of the activity, the children's flexibility in thinking, use of materials, the effort of the students, and the total arrangement of the task, were considered.

As stated earlier, creativity can be enhanced by reaching the widest possible range of “images, sketches, facts, information, feelings, words, and existing ideas” for them to bring to surface previously unrecognized relationships and unrelated ideas (Barnes, 1993: 9). Making these connections is “crucial to creativity” (Barnes, 1993: 9), thus, miscellaneous material has been provided for the children. In order to use the resources successfully, children must be given a thorough understanding of “how materials behave”, and the skills necessary to be creative and expressive (Barnes, 1993: 105). Therefore, the students were given a short demonstration of the supply of materials and also of the design elements and principles. Since, all groups of students were already in knowledge of the design elements and principles, they were only given a short reminder.

As resources and materials are very influential on learning and creativity at the sixth grade level, a variety of materials that could be used in several ways were supplied to the children. During this age, they become increasingly aware of details in their environment, are selective, and have a great capacity to control materials. Furthermore, as the observations and representations of the environment gains importance, symbols that express ideas -which are used frequently until this age- lose their significance.

“Advanced forms of symbolic imagery” are abandoned for “visually realistic” means of representation. Moreover, children explore their environment through drawing and “point out details of shape, color, pattern”, and other design elements (Barnes, 1993: 92).

Because design education and art are integrated activities (Barnes, 1993), drawings were accepted as the two-dimensional part of the task.

Thus, instead of asking the students to use shapes and forms in the two-dimensional planning phase of the task, they were asked to draw a picture of the desired art-room with reference to their current one, and use any type of drawing that best expressed their ideas. The students were expressive in their drawings and depicted their needs and preferences with detail. These drawings were later used to complete any gap that may have occurred from lack of time or ability of expression in the models (see Figures 3.9, 3.10, 3.11, 3.12).

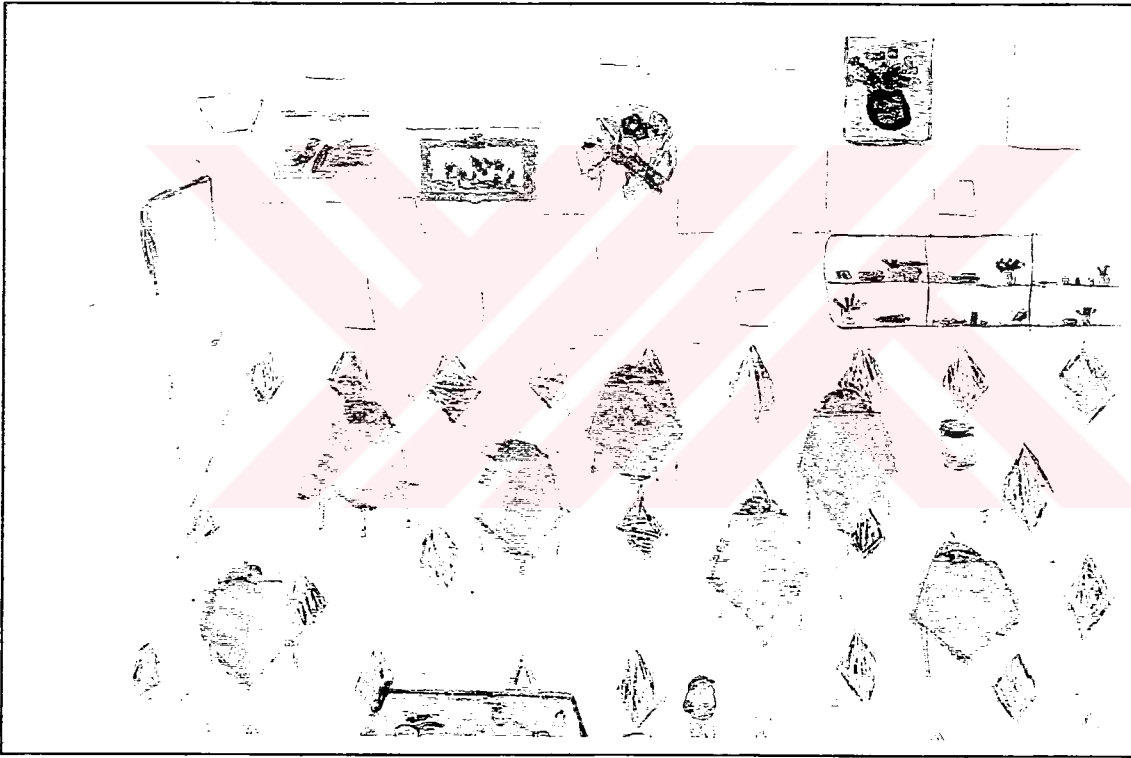


Figure 3.9. Student Drawing from EB Depicting an Individual Seating Organization

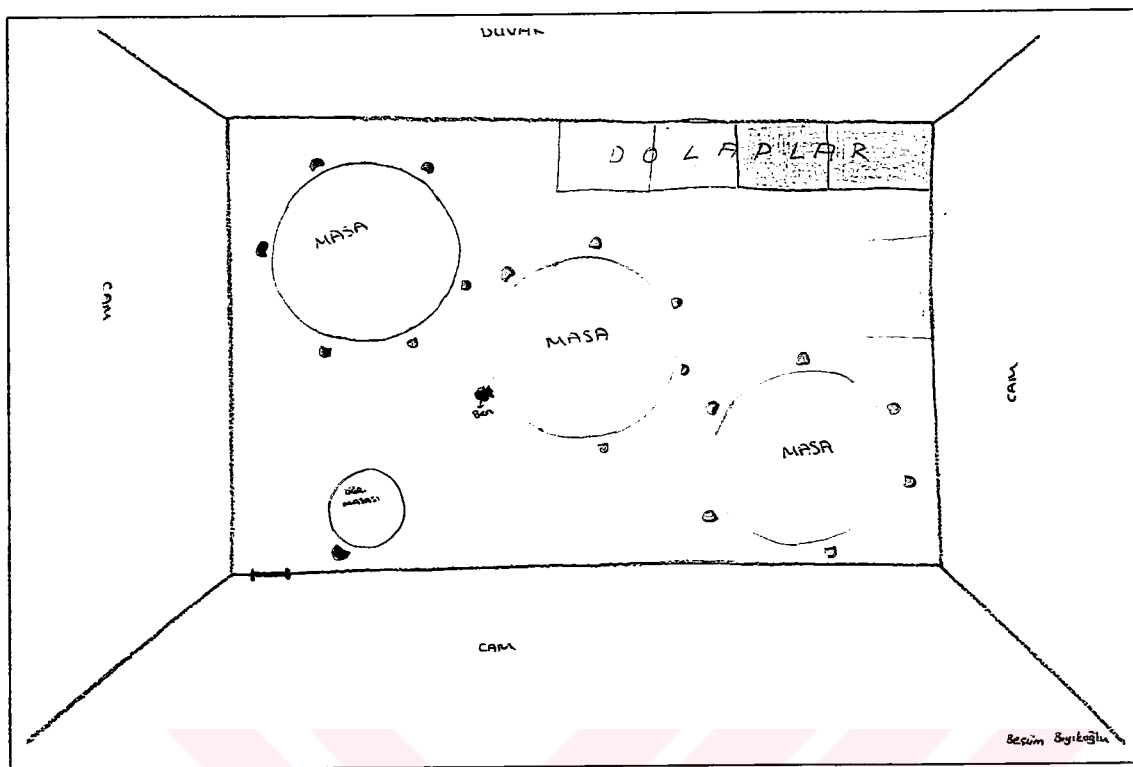


Figure 3.10. Student Drawing from EB Depicting a Grouped Seating Organization

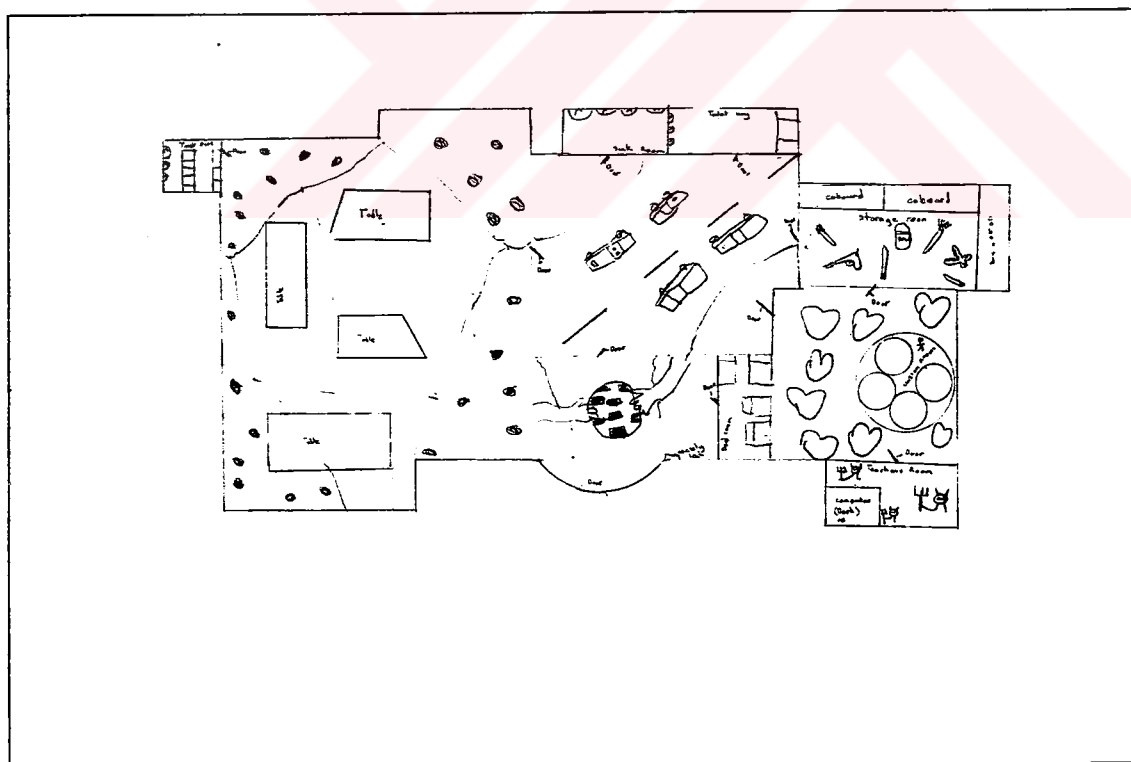


Figure 3.11. Student Drawing from BUPS Depicting Different Seating Organizations

This project depends on the notion that children are more creative in environments they contribute to, and which they are happier in. Their contribution and happiness were modelled in their individual projects, as they also placed themselves in the art-room as a model. Placing themselves in the environment they designed -both in the drawing and the model- enabled the students to better identify with and feel included in their individually designed environments.

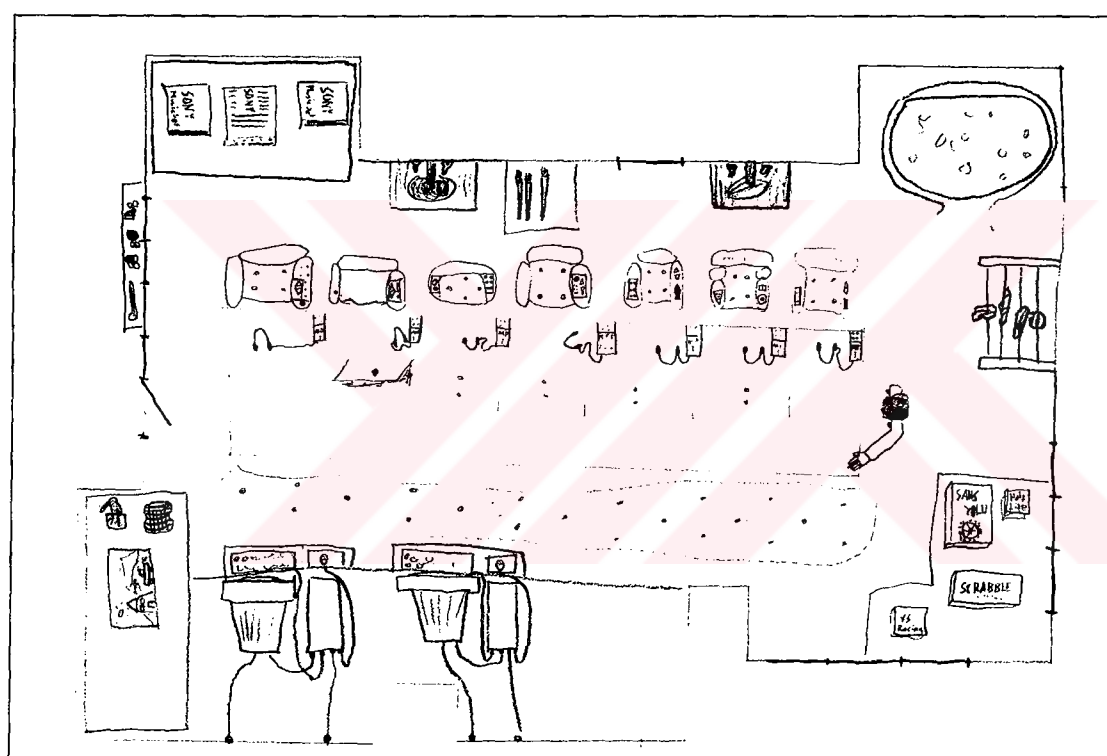


Figure 3.12. Student Drawing from BUPs Depicting a Grouped Seating Organization

The students were allowed a wide range of materials to organize their art-rooms in the way that they wanted the space to be. They were allowed to make any kind of extension or subtraction from the original art-room and could choose to design a corner of the art-room that they preferred, instead of the whole. Every decision made in the process of

design of the children was considered a clue for how the art-room should be designed, and how it can enhance the creativity of the children.

The students had to decide about what materials to use in order to best fit the needs of their projects, and think about how they could modify or improve their plans, which called for a lot of creative thinking on the children's part. They had to understand and establish the balance between "functional and visual elements" to both create a space that was aesthetically pleasing and efficient at the same time. The two-dimensional part had the advantage of both being a base from which the three-dimensional part took off, along with the property of being a clue for the research in completing the lacking parts of the three-dimensional part. That is to say, even if in the three-dimensional part of the activity, the students could not apply all the elaborate details and the finishes, they could still give hints about what they actually wanted to do.

In both the two-dimensional planning phase and the three-dimensional model-making phase, the students were asked to decide on where they would be in the art-room they planned. This enabled a connection between the student and the environment they designed, or identification of the student with the environment. The choice of location and activity the student preferred to involve in, and the size of the depiction of the model of the student served to give insights to the self-concept of the student.

3.3. Results of the Study

A pilot study was planned and carried out two weeks before the research was performed in the actual setting. The questions in the questionnaire were tested for repetitions and clarity with two sixth grade elementary school students and an elementary school art-teacher. In addition, the fundamentals of the observation and the three-dimensional task were discussed with two sixth grade students and three art teachers from different schools.

The combination of the findings of the three methods -observations, questionnaires, and tasks- used throughout the research, enables the understanding of the overall effect of the environment on the creativity of sixth grade students. These three methods were used to double-check each result in order to obtain secure final results.

3.3.1. Comparative Results of the Questionnaires

The questions in both the teachers' and the students' questionnaires were formed depending upon characteristics of the defining elements of creativity- creative *person*, *process*, *product*, and *environment*- and asked to be answered before, during, and after the activity. The "person" and "environment" sections were answered before, the "process" section during, and "product" section after the activity. Asking parallel questions to both the teachers and students enabled the comparison of answers of the students about themselves and the teachers about the students. Moreover, the teachers were asked to state their own opinions on the environment. The mean scores of the

teachers and students related to the person, process, product, and environment are depicted in Table 3.1.

In order to analyze the results of the questionnaires, comparisons between the answers of the teachers and the students were made. In certain characteristics such as, “originality”, “sensitivity”, and “completion” in the person part; “originality” and “completion” in the process part; “usefulness” in the product part; and “isolation” in the environment part, there seemed a greater difference in the answers of the teachers and students compared to the others. Thus, in order to investigate these differences and to examine the remaining of the responses, t-tests were applied. These tests were applied in order to find out the association between the answers of the teachers and students (see Table 3.1 and 3.2, Appendix C). The person, process, and product parts were analyzed taking both schools into consideration, whereas the environment part was analyzed individually for each school.

3.3.1.1. The “Person”

The first defining element of creativity, that is, the “person” constitutes of certain behavioral characteristics which follow as, *originality*, *self-courage*, *sensitivity*, *completion*, *control*, and *negativity* (see Table 3.1 and 3.2). These characteristics are analyzed in order to complete the creative framework.

There is no significant difference between the answers of the teachers and students related to the questions on *originality* ($t = -0.827$, $df = 23$, $p > 0.1$) (see Appendix C.1.1).

The total mean was 3.39 on a scale ranging from 1 to 5. The answers of the students and teachers to *self-courage* were quite close to each other ($t=0.84$, $df=23$, $p>0.1$) with a mean of 3.76 in total (see Appendix C.1.2). *Sensitivity* was another characteristic found to be related, as the answers of the teachers and students were consistent ($t=0.76$, $df=23$, $p>0.1$), with a total mean of 3.75 (see Appendix C.1.3).

There was a significant difference in the answers related to questions on *completion* ($t=2.58$, $df=23$, $p<0.05$) with a mean of 3.12 (see Appendix C.1.4). Thus, individual t-tests were carried out for each school and the responses were found to be quite similar in EB ($t=1.10$, $df=10$, $p>0.1$) with a mean of 3.60 for the teacher and 3.68 for the students (see Appendix C.1.5). However, a significant difference was observed in BUPS ($t=2.45$, $df=12$, $p<0.05$), with a mean of 2.50 for the teacher and 2.86 for the students (see Appendix C.1.6). The answers to questions on *control* were also not significantly different between the teachers and the students ($t=0.74$, $df=23$, $p>0.1$), and had a mean of 3.57 (see Appendix C.1.7). The answers of the students and teachers were significantly different related to *negativity* ($t= -2.19$, $df=23$, $p<0.05$) (see Appendix C.1.8). However, when the t-test was carried out individually for each school a likeness was found between the responses in both EB ($t=-1.30$, $df=10$, $p>0.1$) with a mean of 4.36 for both the teacher and students; and BUPS ($t= -1.72$, $df=12$, $p>0.1$) with a mean of 4.00 for the teacher and 4.02 for the students (see Appendix C.1.9 and C.1.10).

Table 3.1. The Mean Scores of the Teachers and Students Based on the Questionnaires.

		ERKEN BAŞARI ELEMENTARY SCHOOL		BİLKENT UNIVERSITY PREPARATORY SCHOOL	
		Teacher	Student	Teacher	Student
PERSON	Originality	3.27	2.72	3.37	3.98
	Self-courage	3.58	3.72	3.49	4.15
	Sensitivity	3.27	3.90	3.38	4.46
	Completion*	3.60	3.68	2.50	2.86
	Control	4.27	2.90	2.84	4.30
	Negativity*	4.00	4.02	3.57	3.61
PROCESS	Originality	2.90	2.54	2.38	4.07
	Self-courage	3.09	3.34	3.15	3.28
	Completion*	4.00	4.54	3.61	4.15
	Isolation	3.09	3.18	3.30	3.53
PRODUCT	Originality	3.33	3.45	2.89	3.92
	Self-courage	3.68	3.12	3.23	3.56
	Elaboration	4.36	3.31	3.42	3.73
	Flexibility	4.36	2.63	3.23	3.53
	Fluency	3.54	3.36	3.80	3.61
	Identification	3.22	2.76	3.61	3.96
	Usefulness	2.68	3.40	3.34	3.84
ENVIRONMENT	Flexibility	4.15	4.10	3.40	3.34
	Maintenance	4.00	4.02	3.57	3.61
	Design Elements	3.33	3.29	3.33	3.24
	Identification	3.60	3.53	2.66	2.79
	Concentration	4.00	3.90	4.00	4.07
	Isolation	5.00	3.27	3.00	2.92
	Contribution	3.00	3.27	3.00	3.15

(Note: The results depend on the four components of creativity, and are calculated depending on a scale ranging from 1 to 5. The internal validities of the questions were controlled by Alpha Cronbach tests, and the only the validities over 0.8 were taken into consideration). * There is a significant difference between the teachers' and students' responses at $p < 0.05$.

Table 3.2. The Correlations of the Teachers' and Students' Responses in the Two Schools.

		TOTAL CORRELATIONS	
		EB	BUPS
PERSON	Originality	0.67	
	Self-courage	0.84	
	Sensitivity	0.82	
	Completion	0.85	
		0.92	0.66
	Control	-0.41	
	Negativity	-0.11	
		-0.27	-0.01
PROCESS	Originality	0.77	
	Self-courage	0.65	
	Completion	0.46	
		0.29	0.61
	Isolation	0.69	
PRODUCT	Originality	0.77	
	Self-courage	0.61	
	Elaboration	0.73	
	Flexibility	0.62	
	Fluency	0.46	
	Identification	0.67	
	Usefulness	0.43	

(Note: The correlations relate to the questionnaires, according to the person, process, and product components of creativity. All correlations except Person-Negativity and Person-Control were positively correlated. Person-Negativity, Person-Completion, Process-Completion were found to have high positive correlations, but their t-test results were found to be unrelated. The mean comparisons of Person-Completion, Person-Negativity, and Process-Completion were found to be unrelated, thus, individual tests were carried out).

The students' politeness, their annoying or egocentric behavior were tested for consistency and the teachers' responses were found to be confirming the students' thoughts on their own behavior. Negativity was especially important in that it consists of certain negative characteristics that an individual may carry during the creative process.

3.3.1.2. The "Process"

The "process" part consists of *originality*, *self-courage*, *completion*, and *movement* (see Table 3.1 and 3.2). The responses to the questions on *originality* were found to be not significantly different ($t=1.51$, $df=23$, $p>0.1$), with a total mean of 2.97 (see Appendix C.2.1). An association of likeness was also found between the answers to questions on *self-courage*, ($t= -0.49$, $df=23$, $p>0.1$), and the mean of the answers was 3.21 (see Appendix C.2.2). *Completion* is a characteristic that showed an association of difference between the answers ($t=3.00$, $df=23$, $p<0.01$) (see Appendix C.2.3). Thus, t-tests were applied individually for each school, and in EB the answers of the teachers and students were not significantly different ($t=1.74$, $df=10$, $p>0.1$) with a mean of 4.00 for the teacher and 4.54 for the students, whereas in BUPS they remained significantly different ($t=2.50$, $df=12$, $p<0.05$) with a mean of 3.61 for the teacher and 4.15 for the students (see Appendix C.2.4 and Appendix C.2.5). While conversations made with the students, most in this school stated that they enjoyed and working on the project and would not feel comfortable without finishing any project they were working on, and especially this project as they enjoyed it. Finally, *isolation* also brought out a relationship of not significantly different character ($t=0.41$, $df=23$, $p>0.1$), with a mean of 3.27 in total (see Appendix C.2.6). In EB, four of the students stated that they preferred working alone,

and the remaining stated that their preference depended on the project and how they felt. This means that they need flexibility inside the art-room in order to satisfy their changing needs. The four students that stated that they preferred working alone also stated that they sometimes felt restricted inside the art-room and this was dependent mostly on the size of the space. In BUPS, the teacher, as a constant observer had stated quite correctly the working styles and preferences of grouping, flexibility, or isolation of each student. One student stated that he preferred working alone as he can more easily realize his ideas, one student stated that she preferred working in a pair as she could get the necessary support she needed from her friend but at the same time could state her own individual ideas. The rest of the students stated that they liked working both in groups and individually depending on the project, meaning that they wanted the environment to respond to their changing needs and be flexible enough to support it. The teacher, except for the students wanting to work individually, stated that the students liked working both individually and in groups according to their moods and the project, confirming the responses of the students.

3.3.1.3. The “Product”

The “product” part consists of *originality*, *self-courage*, *elaboration*, *flexibility*, *fluency*, *identification*, and *usefulness* (see Table 3.1 and 3.2). The answers to the questions on *originality* were found to be consistent ($t = -0.21$, $df = 23$, $p > 0.1$), with a mean of 3.39 (see Appendix C.3.1). *Self-courage* was also found to be not significantly different ($t = 1.21$, $df = 23$, $p > 0.1$) with a mean of 3.39 (see Appendix C.3.2). The responses to questions on *elaboration* were found to be in association with each other ($t = 0.22$, $df = 23$, $p > 0.1$), and

having a mean of 3.70 (see Appendix C.3.3). The responses to the questions on *flexibility* in the creation of a product were also found to be in association with each other ($t = -0.32$, $df = 23$, $p > 0.1$), with a mean of 3.43 (see Appendix C.3.4). *Fluency* was also found to be not significantly different in the answers given to the questionnaires ($t = 0.64$, $df = 23$, $p > 0.1$), and had a mean of 3.54 (see Appendix C.3.5). Another characteristic that was not significantly independent character was *identification* ($t = 1.09$, $df = 23$, $p > 0.1$), with a total mean of 3.38 (see Appendix C.3.6). Finally, the responses to *usefulness* is also not significantly different ($t = 1.71$, $df = 23$, $p > 0.1$), with a total mean of 3.31 (see Appendix C.3.7).

Most students stated that they created models that they could move freely and enjoy themselves in. Three students in total stated that this would enable them to finish their work more quickly and be more creative. The students in EB created models that mostly consisted of different arrangements of seating allowing a choice of working space. The students in BUPS preferred flexible arrangements, different seating arrangements, and comfortable furniture such as pillows, couches, and individual working areas. What stood out in models of both groups was the design of different working spaces in one space shows the need for the flexibility of the environment allowing for changing needs.

Another feature that was seen in many projects was that the number of seats in different arrangements that were designed were far more than the number of students. This may also mean that the students prefer a wide range of choices inside the art-room in order to satisfy different needs.

3.3.1.4. The “Environment”

The “environment” part is the last but most significant element completing the definition of creativity, and consists of *flexibility, maintenance, design elements, identification, concentration, isolation, and contribution* (see Table 3.1). As the research has been carried out in two different learning environments, the comparisons between the students and teachers were made by applying individual t-tests for each school. This enabled the analysis of the consistency of the responses between the teacher and the students.

The responses to questions on *flexibility* were found to be quite similar to each other in EB ($t = -1.18$, $df = 10$, $p > 0.1$), with a mean of 4.15 for the teacher and 4.10 for the students (see Appendix C.4.1). Similarly, the answers of the students in BUPS were quite consistent with the teacher’s ($t = -1.62$, $df = 12$, $p > 0.1$), with a mean of 3.40 for the teacher and 3.33 for the students (see Appendix C.4.2). The difference in the means shows that the teacher and students of EB feel that their art-room is quite flexible, allowing for changing needs. One reason that the mean of BUPS is lower may be because although the space is quite large and the students can move freely inside the space, the organization of the furniture that have been used is always the same. Thus, there is still a restriction, especially in the working areas. This helps to point out the importance of the organization inside the space. Another reason may be that, in addition to the inflexible organization there are spaces that belong to the teacher alone, with furniture to signify the difference of the teacher’s place inside the art-room. This may be effective on the students’ thoughts about the flexibility inside the art-room.

Maintenance, was a factor that also resulted in similar answers between the teacher and the students in both schools. EB showed a mean of 4.00 for the teacher and 4.02 for the students ($t= 0.34$, $df=10$, $p>0.1$), and BUPS showed a mean of 3.57 for the teacher, and 3.61 for the students ($t=1.07$, $df=12$, $p>0.1$) (see Appendix C.4.3 and Appendix C.4.4). In both schools, students stated that they contributed to the design of the art-room with their art-work that they displayed inside the space, but would like to contribute to the overall design. It was also stated that the reason that they enjoyed this project was because it gave them a chance to do something that they had not done before, namely to design the environment that they lived in.

The responses to questions on *design elements* were also quite close in both schools, in that EB ($t= -0.34$, $df=10$, $p>0.1$) had a mean of 3.33 for the teacher and 3.29 for the students (see Appendix C.4.5). The results of BUPS were similar between the teacher and the students ($t= -0.89$, $df=12$, $p>0.1$), and also similar to EB's results, with a mean of 3.33 for the teacher and 3.24 for the students (see Appendix C.4.6). The teachers and students generally stated that they liked the lighting, quality of the air, and colors inside the art-room. Most students in EB and BUPS stated that they liked the large windows and the large amount of light that their art-rooms took in. They also stated that the environment could have been more colorful, as in their own models. However, the teacher in BUPS stated that the space would be better with neutral colors to provide a pleasant atmosphere, and to act as a background for the art-work of the children.

Identification resulted in similar answers in both EB ($t = -0.43$, $df = 10$, $p > 0.1$), and BUPS ($t = 1.26$, $df = 12$, $p > 0.1$) (see Appendix C.4.7 and Appendix C.4.8). An interesting result is that EB resulted in a much higher mean score compared to BUPS, in that, 3.60 was the mean for the teacher and 3.53 for the students in EB, and 2.66 for the teacher and 2.79 for the students in BUPS. The same kind of relation can be seen in the responses to questions on *concentration* where BUPS scored higher than EB in the means. The mean of the teacher was 4.00, and the students 4.07 in BUPS, whereas, the mean of the teacher in EB was 4.00, and the students 3.90. However, the responses of the students and teachers were similar in both EB ($t = -0.26$, $df = 10$, $p > 0.1$) and BUPS ($t = 0.43$, $df = 12$, $p > 0.1$) (see Appendix C.4.9 and Appendix C.4.10). A significant difference was found between the responses of the teacher and the students to questions on *isolation* in EB ($t = -4.03$, $df = 10$, $p < 0.01$), with a mean of 5.00 for the teacher and 3.27 for the students (see Appendix C.4.11). The students felt that they were in need of more space inside the art-room especially for their individual use. However, the answers were found to be no significantly different in BUPS ($t = -0.69$, $df = 12$, $p > 0.1$), with a mean of 3.00 for the teacher and 2.92 for the students (see Appendix C.4.12). Finally, in *contribution* the responses were close to each other in both EB ($t = 1.39$, $df = 10$, $p > 0.1$), and BUPS ($t = 1.47$, $df = 12$, $p > 0.1$) (see Appendix C.4.13 and Appendix C.4.14). The teacher and students scored a mean of 3.00 and 3.27 in EB, and 3.00 and 3.15 in BUPS, respectively.

The students were asked to describe what the art-room meant or told them. In EB, most of the students liked their art-room. Seven of the students thought that the art-room was inspiring, peaceful, and cool in warm weather, and that it expressed freedom, happiness,

and flexibility. Four of the students, in return, thought that, the art-room could be restricting and boring at times. These students designed projects that seated several students around large tables, focusing on the need of grouping, and that did not have ceilings. This showed that these students were in need of a larger art-room environment with more space around the tables. Only two students in EB felt that the space should be more organized compared to its present design, in addition to being renewed, and stated that the space exerted a certain amount of pressure on them asking for responsibilities such as keeping the space “nice”, “clean” and “organized”. These students designed spaces that satisfied their preference of order, which they identified as “tidy”, “easy to clean”, “detailed”, “organized”, and “artful”.

Two students in EB felt that the art-room was like a normal classroom, thus, felt restricted and wanted to renew it. The large windows were found to be one of the most important features of the art-room for the students according to the responses, in that six of the students believed that the glass windows were inspiring, two thought that they made the art-room peaceful and cool. One student felt that it was not comfortable, and in turn designed an environment that she believed was “dark” and “interesting”.

In BUPS, similar to EB, most of the students liked their art-room. They identified the space as, “fun”, and “comfortable”, and enabled them to be “free” and “happy”. They also liked to be able to speak while working in the art-room. Three students, in return, stated that they sometimes felt restricted because of the inflexible organization. These students designed art-rooms that combined different seating arrangements allowing a

choice of working space and style -individual or group- and soft cushions and comfortable chairs, without any furniture for the teacher. This showed these students' need for being able to work in different styles without a restrictive organization in the art-room. They also reflected individual tastes and hobbies by designing spaces that they could work on the computer, or watch a pool placed in the art-room for relaxation during the process of working. It can be stated that, although these students were allowed to move freely inside the space, talk, and share ideas with the teacher and other students, they felt a certain amount of pressure resulting from the organized layout of the art-room.

When asked about the spaces that they designed, most students in BUPS stated that they would feel much more “relaxed”, “comfortable”, “free”, “confident”, and “creative”, and have much more “fun” in their individual art-rooms. The majority of the projects did not have much color, as the students preferred to spend their energy on working on the planning phase of their art-rooms. This may be because they needed a bigger change in the organization of their art-room, compared to color. Two students preferred to design spaces that had sub-spaces in them to carry out different activities. This may shed light into the need for dividing the space that was quite large into different spaces, and allow a certain amount of variety in the design and organization.

Getting used to the environment is very important in the amount of identification necessary for creativity to flourish. One student in EB, stated that she used to produce bad art-work a while ago, but now that she was comfortable and responsible of the art-room, she made better ones. This could have been true, but could also mean that the

student only *thought* she produced bad art-work in the beginning because she lacked self confidence, but as she got used to the environment she started believing in herself and this inevitably was reflected in her art-work. These options were checked with the teacher's answers on the topic and was concluded that the student's work improved as she got used to, identified with, felt responsible of the environment, and started believing she belonged there. She designed an art-room that she identified as "familiar", "plain", "flexible", and that she "belonged to".

In EB, when asked if the students liked working in a group or alone, the answers were equal in both modes of working. Five students liked working in a group because, they thought it was fun, they could exchange ideas and materials, and they liked their friends. Five students liked working alone as they could concentrate on their work, be alert, not share their materials, use their material in a better way, and have nobody interfere with their work. One student stated that she sometimes liked groups and sometimes being alone as she thought that the working strategy depended on the type of work that had been given. The equality in the answers and the reasons given with reference to previous study in the art-room for choice of working mode showed that this art-room environment allowed for both grouping and being alone, depending on the preference of the student.

In BUPS, most students stated that they liked working both individually and in groups, depending on the project that has been given. Finishing work more quickly, having a good time, sharing ideas, feeling safe, are reasons stated for preferring to work in groups. In return, disputes, having to convince other group members, confusion of ideas,

inequality between members of the group, and having to share the materials are reasons stated for preferring to work individually. Most students liked working in both styles depending on how they feel and the given project. Thus, there is a need for the art-room environment to satisfy different modes of working. It can be stated that, the flexibility of the environment in providing opportunities for choice of working strategy prepares the ground for creativity.

The teachers of both schools stated very similar features that an art-room should carry to support creativity. These features were stated as a space that allows for movement, is calm but exciting, has a wide range of different materials, enough amount of natural light, and is safe. It can be stated that the users of both environments enjoy working in their art-rooms, due to their different characteristics, namely flexibility and grouping. The need for flexibility in the design and organization of the art-room, although there was a flexible management of both spaces, stood out among all responses. Grouping was something that the students did not always prefer, but they also needed the environment to enable it when necessary. A combination of certain characteristics of both spaces would create an environment that supports creativity. The ideas of the students and teachers stated above, shed light on what the users of the art-room environment think about the environment and how it can be improved.

3.3.2. Results of the Observations

Observations were made from the beginning to the end of the implementation of the research. The characteristics of the creative and non-creative *person, process, product,*

and *environment* were organized in pairs, and marked throughout the phases (see Appendix B.1 and B.2). The observation consisted of a checklist of binary observational characteristics. These were checked throughout the application, and the results were then compared with the answers to the parallel questions that aimed to clarify the same points from different views, in the students' and the teachers' questionnaires. Although certain questions may not be directly reflected in gestures and movements of the students, this problem was overcome by the continuous conversations held with the students and teachers during the process. The majority of the students were friendly and talkative, thus, constantly provided information that supported the observed characteristics. Additionally, some of the answers were confirmed with the teacher during the observation. A qualitative procedure was followed in the analysis of the observation, as the choice of working strategy of the students was aimed to be found out and confirmed with the students' and teachers' responses.

3.3.2.1. The "Person"

The "person" part consists of *originality*, *self-courage*, *sensitivity*, *completion*, *control*, *negativity*, *isolation*, and *humor* (see Table 3.3). *Originality* depends on observational characteristics such as, not being conventional, not having a simple way of approaching problems, and the ability to easily produce products. These factors can be observed from the gestures, facial expressions, of the students in addition to the questions they ask and the thoughts of the teacher.

The results of the two schools were quite close to each other, where EB scored 50.00% creative, and BUPS scored 51.28% for the characteristic of originality. *Self-courage* consists of characteristics such as, being extrovert, asking for help, and being adventurous and positive in complex situations. These were observed taking into consideration the feedback provided by the children during their creative process. While some students could not continue their work without asking what material to choose or what a “correct” organization would be for their models, others had the courage to apply their thoughts directly to their projects and respond confidently when asked about their projects. The scores of EB and BUPS were quite close to each other, with 47.52% scoring as creative in EB and 44.35% for BUPS. *Sensitivity* depends on characteristics such as being emotionally sensitive, being sensitive to the things that happen in the environment, and being curious. Students who continuously analyze the environment and ask questions on details of the environment can be identified as sensitive. EB scored considerably higher than BUPS, with 89.09% of the students resulting as creative in the first school, and 43.32% in the second.

Control is defined by characteristics such as being defensive, and being balanced. The students who did not feel the need for defending themselves against questions of their friends, teacher, or observer; and did not shout or bother others in the art-room were evaluated as controlled. The results of the two schools were quite similar in that, EB scored 87.87% while BUPS scored 84.61% for control. *Negativity* consists of negative characteristics that may be found in individuals during the creative process, such as being annoying or being totally ignorant of others in the same learning environment. Although

not many, there were some students who occasionally showed rude behavior towards their friends or the teacher in both schools. This actually shows that these students scored higher in creativity than more polite students, in this category. The results of both schools were quite close to each other, with EB scoring 25.46%, and BUPS scoring 27.69%.

Completion consists of characteristics such as, starting a given project right away, not giving breaks until her/his work is finished, and mingling with the whole class. EB was found to be 75.76% creative for the characteristic completion, and BUPS 43.90%.

Characteristics such as being estranged or being able to work with others form the *isolation* category. This characteristic could easily be observed in the children while they were working. There were students who preferred to work alone in every class, while some preferred to occasionally work alone, and some always working in groups. These students were observed taking into consideration their behavior and cooperation with the other students, while also controlling their responses to the related question in the questionnaire and the explanatory essay question in which they were asked the reason of their choice. There was quite a difference between the scores of the two schools, as EB scored 45.45%, and BUPS scored 12.82% creative in this category. *Humor* is a characteristic due to the individual's spontaneous and creative thinking, and consists of characteristics such as being humorous or childlike. This characteristic could be observed from the students' humorous behavior toward their friends, the teacher, and the observer. In EB 48.48% scored creative in this category, while the same number was 61.53% in BUPS.

Table 3.3. The Comparison of the Observational Characteristics of the Two Schools in Percentages.

	EB		BUPS	
	CREATIVE	NON-CREATIVE	CREATIVE	NON-CREATIVE
PERSON				
ORIGINALITY	50.00%	50.00%	51.28%	48.72%
SELF-COURAGE	47.52%	52.48%	44.35%	55.65%
COMPLETION	75.76%	24.24%	43.90%	56.10%
SENSITIVITY	89.09%	10.91%	43.32%	56.68%
CONTROL	87.87%	12.13%	84.61%	15.39%
NEGATIVITY	25.46%	74.54%	27.69%	72.31%
ISOLATION	45.45%	54.55%	12.82%	87.18%
HUMOR	48.48%	51.52%	61.53%	38.47%
PROCESS				
ORIGINALITY	74.54%	25.46%	54.61%	45.39%
SELF-COURAGE	68.83%	31.17%	75.52%	24.48%
COMPLETION	75.76%	24.24%	56.16%	43.84%
NEGATIVITY	23.07%	76.93%	20.00%	80.00%
IDENTIFICATION	81.81%	18.19%	73.07%	26.93%
MOVEMENT	50.94%	49.06%	46.16%	53.84%
PRODUCT				
ORIGINALITY	61.81%	38.19%	90.76%	9.24%
IDENTIFICATION	22.22%	77.78%	76.92%	23.08%
USEFULNESS	100.00%	0.00%	100.00%	0.00%
ENVIRONMENT				
FLEXIBILITY	85.00%	15.00%	87.50%	12.50%
MAINTENANCE	68.45%	31.55%	65.45%	34.55%
DESIGN ELEMENTS	70.00%	30.00%	70.00%	30.00%

(Note: Two decimals have been furthered in each percentage. The internal validities of the observational features were controlled by Alpha Cronbach tests, and the only the validities over 0.8 were taken into consideration.)

3.3.2.2. The “Process”

The “process” part consists of *originality*, *self-courage*, *completion*, *negativity*, *identification*, and *movement* (see Table 3.3). *Originality* is a category consisting of characteristics such as, imitating friends, or creating new materials or tools. EB scored considerably higher than BUPS, with 74.54% compared to 54.61%. This may be a result of the students in BUPS continuously in groups, thus, being affected from each other’s work. *Self-courage* consists of characteristics such as being independent of others in decisions, or freely and easily transferring thoughts onto the project. The students who occasionally asked questions on the structure of the project were accepted as more creative compared to the students who constantly asked the teacher and the observer about what to do, in this category. BUPS scored higher than EB, as these students were more independent about the decisions they made and responded courageously when asked about their projects, with scores of 75.52% and 68.83%. *Completion* identifies behavior such as, being completely involved in the project, or looking around for ideas. The students who did not choose to give breaks to finish the activity, and even could not stop working when the bell rang were the ones identified as more creative for this category. EB scored 75.76% while BUPS scored 56.16% in completion. Characteristics such as being rebellious during the process, sloppy, or capricious define *negativity*. Students who were indifferent to rules inside the art-room or the teachers’ warnings while working, or who did not care about the mess s/he made around her/him were accepted as more creative for this category. This percentage was nevertheless quite low in both schools because of certain rules that the children had to obey in the art-room. EB scored 23.07% and BUPS quite similarly scored 20.00%. *Identification* involves being

connected to the work being done, and reflecting this with gestures while working. Without being aware of themselves, the students mimicked bodily movements of the model of themselves in their projects, and looked inside the art-room they built from different angles to feel what it would have been like to be in that room. Other students built their own models because they were told to and did not spend time trying to decide where to place the model inside the art-room. EB scored 81.81% while BUPS scored 73.07% in this category. Being flexible in bodily movements define the *movement* category. Children who were not working in a rigid posture, and who changed places in order to get material or cut a large piece of cardboard, for example were accepted as more creative in this category. The results in the schools were quite similar, with EB scoring 50.94% and BUPS scoring 46.16%.

3.3.2.3. The “Product”

The “product” part consists of *originality*, *identification*, and *usefulness* (see Table 3.3). The idea of making of a three-dimensional model of the art-room relies on the dependence of creativity on the “product”. Asking the students to design and organize their art-rooms on a model was one of the best ways to establish the connection between the art-room environment, the product, and the students. The students in both schools enjoyed this phase immensely, and did not want to stop designing when the duration of the activity ended.

Students who created products that were new, or novel define the category of *originality*. The projects that did not imitate the existing art-room, or other projects were accepted as

creative for this category. BUPS scored considerably higher than EB, with 90.76% compared to 61.81%. The reason that the score is lower in EB is because of some students who used the existing elements in the art-room such as, the brick wall, shelves, and the large glass windows. It can be stated that it was more difficult for the students in this school to visualize the art-room space empty. However, when these students were asked why they used the same elements directly or slightly modifying them, they stated that they liked them and therefore wanted to include them in their projects. These explanations of the students give insights into what kinds of design elements were preferred in the particular art-room environment. *Identification* consists of characteristics of the product such as, being reflective of individual preferences or a certain individual way of how the particular project may be furthered. These characteristics were observed from how the students placed the models of themselves inside their projects, and the questions they were asked about why they designed certain elements such as a single bed or couch for themselves. The students in BUPS generally chose to design an aloof corner or couch, or a specific area closed by walls, for themselves in the same space with the general working area. This may be an indication of the need for having the choice of being able to work in different patterns, an especially being able to occasionally work alone – shortly flexibility. BUPS scored considerably higher in this category with the special places the children designed for themselves, compared to the equalitarian organizations in EB, with 76.92% and 22.22%. Characteristics of the project such as being appropriate and functional, define the category of *usefulness*. All students in both schools scored 100.00% creative for this category as all had designed projects that met the needs of the project, either full of fantasy or down to earth.

3.3.2.4. The “Environment”

The “environment” part consists of *flexibility*, *maintenance*, and *design elements*, and defines an environment that can best support creativity due to its organizational and design characteristics (see Table 3.3). In all three of the categories the two schools had very similar results. *Flexibility* involves certain characteristics of the environment such as, the space being a special place for art classes alone, or having limitations. EB scored 85.00% and BUPS 87.50%. *Maintenance* consists of characteristics such as, keeping the art-room clean or contributing to the design. The results were quite similar, with 68.45% in EB and 65.45% in BUPS. The slight difference results from the ease of using the materials in EB compared to BUPS. Not having to ask for permission while getting material from the storage brings a certain amount of flexibility to the environment. Finally, *design elements* consist of characteristics such as, being a place with proper lighting or ventilation, or being a cue-rich environment. Both schools scored 70.00% creative in this category, as the ventilation and lighting in EB, and the ventilation and colors in BUPS were accepted as characteristics that especially needed improvement.

3.3.3. The Results of the Task

The *assessment* part was carried out after the implementation of the research had been finished. In this part, each individual product is evaluated on a five-point scale, according to the *characteristics of a creative product*, *design elements* and *design principles* (see Table 3.4). The previously made drawings were also taken into consideration in the evaluation of the models, as they completed the individual art-rooms by providing details that could not be observed from just the model itself. Moreover, the teachers’ thoughts

were taken on each student's project and evaluated accordingly. In addition to assessing the creativity of the products, the design elements, and the design principles, what was aimed to be found out in this activity was to gather information on what the students think about their art-rooms, and how they would have changed it if they had a chance to. Furthermore, the students' preferences and ideas about flexibility and grouping was aimed to be found out. Thus, the projects were evaluated according to these factors, and the evaluation was especially receptive to any other information that the projects might reflect (see Figures 3.13, 3.14, 3.15, 3.16).

The *creativity assessment* part consists of flexibility, fluency, novelty, originality, elaboration, ability to see deficiencies, ability to redefine, and open-ended solutions. Although the results are alike, BUPS scored higher than EB in total, with 3.73 compared to 3.51, due especially to characteristics related to flexibility, ability to redefine, and open-ended solutions. Similarly, in the assessments of the teachers, BUPS rated higher than EB, with 3.74 to 3.49 (see Table 3.4, 3.5, and 3.6).

In the observational analysis of the environment, it was found that EB had 18 creative, and 3 non-creative characteristics in the art-room. Similarly, BUPS had 16 creative and 5 non-creative characteristics. The non-creative characteristics were ones that brought certain strictures to the art-room environment, thus, lowered the amount of flexibility (see Appendix B.2). The results of the assessment of the creativity of the products, the students made in these environments, were also found to be not significantly different between the observer and the teacher in both EB ($t=1.07$, $df=10$, $p>0.1$) and BUPS

($t=0.77$, $df=12$, $p>0.1$) (see Tables 3.5 and 3.6; see Appendix B.3, B.4.1. and B.4.2). This similarity may be a result of different characteristics standing out in both organizations. Therefore, it may be stated that certain characteristics of a flexible organization such as, ability to choose to working style; and others from a grouped organization such as, interaction between the students, have impact on the students' creativity according to this situation.

The students who rated the highest in creativity –according to the mean of the assessment of the observer and teacher- in this section that connects the creative product and the environment, showed similarity in behavioral characteristics and preference of an environment to support creativity. The student in EB who scored the highest liked working in both styles according to the need, was flexible in her gestures, and stated that there should be more space in the art-room so that she can put her belongings. The student who scored the lowest was a very bright student who liked obeying rules and liked doing what she was told. She preferred grouped organizations to flexible ones because she felt more secure in a group.

Table 3.4. The Results of the Creativity Assessments, Assessments of the Design Elements, and Design Principles, According to the Observer and Teacher.

	OBSERVER		TEACHER	
	EB	BUPS	EB	BUPS
CREATIVITY				
FLEXIBILITY	3.27	3.53	3.33	3.57
FLUENCY	3.45	3.61	3.44	3.65
NOVELTY	3.54	4.23	3.36	4.18
ORIGINALITY	3.40	3.61	3.36	3.68
ELABORATION	3.54	3.38	3.50	3.32
ABILITY TO SEE DEFICIENCIES	4.18	4.20	4.22	4.25
ABILITY TO REDEFINE	3.18	3.53	3.20	3.50
OPEN-ENDED SOLUTIONS	3.54	3.76	3.57	3.80
DESIGN ELEMENTS				
LINE	3.74	3.69	3.72	3.65
SHAPE, FORM	4.09	4.00	4.05	3.98
SPACE	3.32	3.50	3.36	3.53
TEXTURE	3.45	3.46	3.48	3.50
VALUE	3.54	3.57	3.50	3.60
COLOR	3.54	3.46	3.50	3.46
LIGHT	2.90	2.15	2.85	2.15
DESIGN PRINCIPLES				
REPETITION	3.50	3.45	3.45	3.40
VARIETY	3.20	3.23	3.18	3.18
RHYTHM	3.45	3.50	3.50	3.55
BALANCE	3.80	3.85	3.90	3.80
EMPHASIS	3.60	3.85	3.65	3.87

Table 3.5. The Comparison of the Mean of Product Creativity of Each Individual Student in EB According to the Observer and Teacher On a Scale Ranging from 1 to 5.

EB SUBJECT NUMBER	OBSERVER	TEACHER
1	2.63	2.54
2	2.36	2.54
3	3.00	2.90
4	2.81	2.45
5	2.63	2.90
6	2.63	2.09
7	2.63	2.27
8	2.63	2.81
9	2.36	2.27
10	2.18	2.54
11	3.09	2.45

Table 3.6. The Comparison of the Mean of Product Creativity of Each Individual Student in BUPS According to the Observer and Teacher on a Scale Ranging from 1 to 5.

BUPS SUBJECT NUMBER	OBSERVER	TEACHER
1	2.38	2.23
2	2.84	2.53
3	2.15	2.07
4	2.61	2.23
5	2.69	2.53
6	2.00	2.15
7	1.76	2.07
8	2.23	2.15
9	2.30	2.23
10	2.15	2.15
11	2.30	2.38
12	1.84	2.00
13	2.61	2.61

The student in BUPS who scored the highest was also comfortable with working in both styles, and his preferences changed according to the need. At times he was silent, and at others he joked with friends, and was flexible in his gestures. He stated in his questionnaire and depicted in his project that, that there should be places where one can work alone when there is a need. The student who scored the lowest did not leave her table while working, and also stated that she felt secure working in groups with her friends.

These results depict the need for flexibility in an environment in order to support creativity, and that size is important for children to freely use all limits of their learning environment. The students who scored lower, preferred working in groups in order to feel more confident about themselves and their work. A learning environment allowing both working styles, and one that can be altered from time to time is one that seems the best for supporting creative activity.

The *design elements* part involves the usage of the line, shape and form, space, texture, value, color, and light. EB's scores were higher mostly due to color, light, and line with 3.51 in EB and 3.40 in BUPS in total. In the teachers' assessments, again EB scored slightly higher than BUPS, with 3.49 to 3.41 (see Table 3.4).



Figure 3.13. Student Model from EB Depicting an Individual Seating Organization

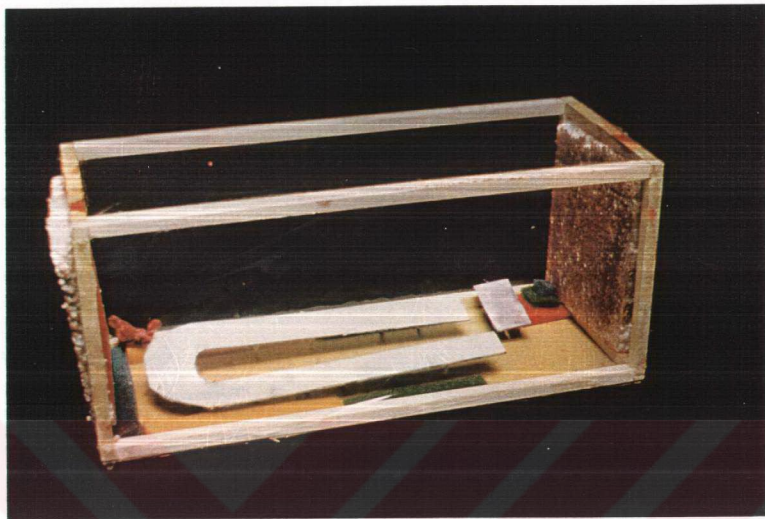


Figure 3.14. Student Model from EB Depicting a Grouped Seating Organization

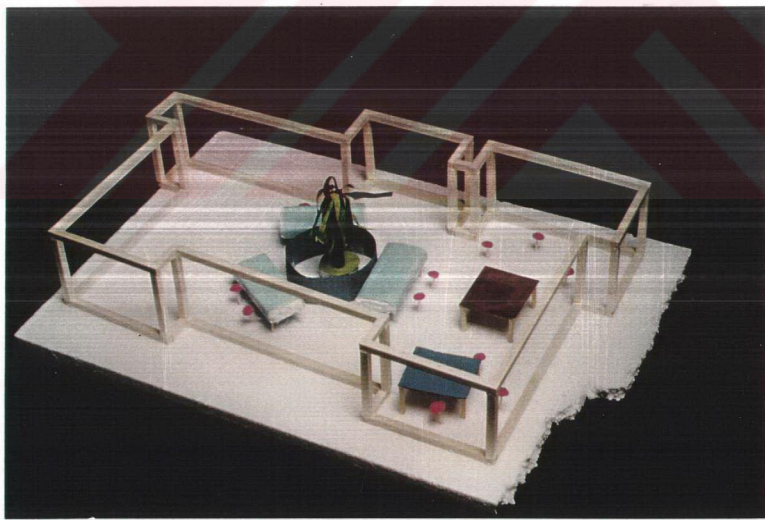


Figure 3.15. Student Model from BUPs Depicting Different Seating Organizations

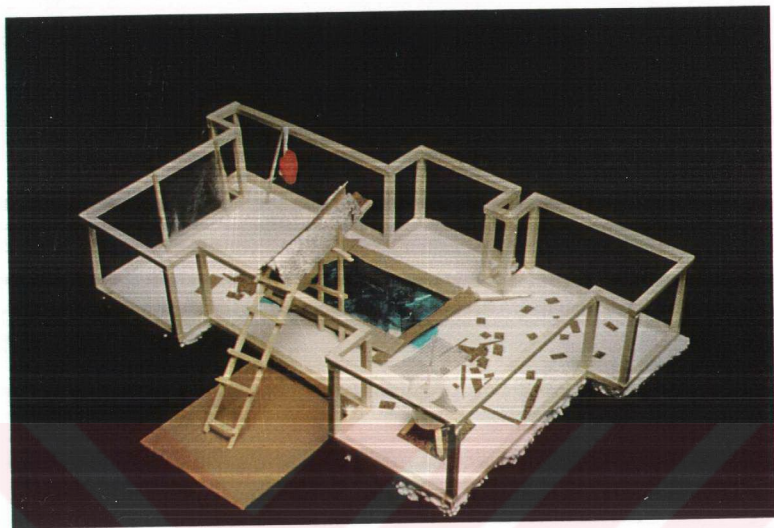


Figure 3.16. Student Model from BUPS Depicting a Grouped Seating Organization

The *design principles* part assesses the usage of repetition, variety, rhythm, balance, and emphasis. The scores showed a slight difference here, with 3.51 in EB and 3.57 in BUPS in total. Although the results are quite similar, BUPS scored higher in variety, balance, rhythm, and emphasis; EB scored higher in repetition. It can be stated that the need for a dominating characteristic, and perhaps different seating arrangements that are spread out evenly, but not repetitive in both art-rooms is reflected in the features balance and emphasis, and stood out among other characteristics in both of the schools. In the assessments of the teachers, BUPS scored slightly higher than EB, with 3.56 compared to 3.53, in total (see Table 3.4).

The assessment of the projects by the observer was important in order to avoid a one-sided assessment of the projects. The results were quite consistent between the observer and the teachers, and give insight into the needs of the students in the art-room.

3.4. Discussion of the Results

This investigation tested the following propositions: the first proposition is that the designed environment has significant effects on people, and behavior and outcomes may be enhanced by the environment. This proposition was tested and the responses to the questions on the environment's effects on projects, individual behavior, and relations with the teacher and other students, were mostly answered in a way to confirm this proposition. The total mean of the responses by the students, given to the questions asking the rate -on a scale ranging from 1 to 5- at which the art-room environment has on:

1. relationships with the *teachers* is 3.71 (Question 26 in the environment section),
2. relationships with other *students* is 3.80 (Question 25 in the environment section), and
3. the *projects* is 4.12 (Question 29 in the environment section), on a scale ranging from 1 to 5.

The total mean of the responses by the teachers, given to the questions asking the rate -on a scale ranging from 1 to 5- at which the art-room environment has on:

1. relationships with the *students* is 3.80 (Question 31 in the environment section),
2. relationships between *students* is 4.45 (Question 32 in the environment section), and

3. the *projects* is 4.12 (Question 36 in the environment section), on a scale ranging from 1 to 5. It can be stated that these scores are high, and depict that the students and teachers believe the art-room has influences on behavior and outcomes, as proposed. Moreover, these responses were supported with the essay questions on what the art-room meant to the students.

It had also been stated that, the environment permits or inhibits interaction between users due to size and organization. The art-room in EB was quite small and the students gave useful information about the barriers that resulted from the size. For example, 6 students stated that they wanted a place of their own that they could keep their things and organize the way they want. The mean of the responses to the question asking if they had a place of their own was 2.18, which shows that the students are in need of a place as such.

The means of the students' responses to the question on whether the organization of the art-room changed from time to time were, 4.64 in EB and 1.54 in BUPS (see Appendix A.1, Question 8). This means that there was a much more rigid organization in BUPS, and the students stated the need for flexibility in their questionnaires and depicted in their projects. Two students had also stated that the hierarchical organization with the teacher's areas exert a certain amount of pressure on them, and effects their behavior. They explained that they were not allowed to easily use the areas that belonged to the teacher, and that this was somewhat restrictive. The teacher had also stated that she did not want the students to come very close to her desk as she was afraid of -especially the

smaller students- knocking off her belongings from her desk, or spilling water or paint on her papers.

It had also been stated that, the size of the art-room environment would be influential on the kind of activity to be done, that is, it was believed at the beginning of the study that, in a small space, students may not be able to implement large projects (Barker and Gump as cited in Moos, 1979). However, this was found to be not true as in both art-rooms the students worked efficiently and without discomfort. The smallness of the size of EB had not affected the students' working, although they had dealt with all kinds of space-taking materials such as styrofoam, cardboard, and long sticks. This may be due to the flexibility inside the space, as the students could work in style they wanted to; one day they combined tables, and the next they placed them against the wall according to the previously defined work of the day.

The second proposition was that, grouping and flexibility inside a learning environment are influential on students' creativity. Both characteristics were derived from a previously made literature survey as two environmental factors that are significantly effective on the creativity of individuals. The purpose was to understand which characteristic was more influential and in what ways. It was found that flexibility was the characteristic that was more influential, and as it allowed for different organizations for different and changing needs. That is, an environment that is organized according to the idea of flexibility allows for grouping, but the opposite is not possible. However, although it may seem that grouping is just many of the organizational patterns that a flexible environment may

offer, they are separate, where grouping is rigid and allows only patterns of groups, and flexibility allows for several different individual and grouped working styles.

With regard to the third proposition, which had stated that the organization of the art-room is influential on the message given to the students, it was found from the explanation to the essay questions, that the students do not feel they contribute to the design of the art-room much, but want to, because only then do they feel they belong to the space, and more responsible of it (see Question 15 in the “product” section, and Questions 5 and 22 in the “environment” section). The students in EB stated that they want more display and storage area to be able to show each piece of work they created to others. This idea involves identification, responsibility, and need of more value given to the art-work, although this factor is mostly due to size. The students in BUPS, on the other hand, wanted more color in the environment provided by the display of their work, and did not want their responsibility in the art-room to be only dependent on cleaning-up. The students of both schools stated quite clearly that they wanted to “take over” the art-room with their own designs and contributions. As the student starts to deeply identify with and feel responsible of the art-room, s/he is more likely to obtain from the environment the message of her/his work being valued, and this provides self-courage which sets the ground for creativity.

The findings of this research suggest several possibilities for future research. This research study supports the significance of the design and organization of the environment and more specifically, the art-room, on creativity. For further research, a

sample group of greater size could be chosen, for example, more than one school for both types of organizations; grouping and flexibility. In addition, different sample groups, such as, schools that carry out art classes in their normal classrooms, and the effects of that type of organization could be investigated.



4. CONCLUSION

This study was begun with the idea that creativity is a possession that is in reality quite ordinary, but is significant to any understanding of education, and thus, should be supported. This study aimed to combine creativity and the environment, and to investigate how the design and organization of the learning environment in which learning and creative activities take place, influence the creativity of the students. The physical characteristics of learning environments were investigated, and it was found that especially two organizational patterns had influence on creativity: *flexibility* and *grouping*. As creativity can be more readily observed in art classes, the art-room was chosen as the learning environment in which the effects would be investigated. Two sixth grade art-rooms -one designed according to the idea of flexibility (EB), and the other grouping (BUPS)- were chosen as this age group is accepted to be at the peak point of creativity.

The study examined art-room environments, and influences of these spaces on the students. The investigation dwells upon the “creativity factor” and how the design and organization of the art-room affects the creativity in students. As the relation between the environment and creativity is not a feature that can be measured as a first degree association, the four characteristics that define creativity –the *person*, *process*, *product*, and the *environment*- were used as a framework for the study.

Questionnaires for the students and teachers to assess the four characteristics of creativity, observations to double-check the results of the questionnaires, and a three-dimensional activity to assess the students' ability in using the elements and principles of design, and creativity were used. As the aim of creativity is production, and as creativity can be best observed from a product, a task was asked to be solved by the students. In order to establish the link between the art-room environment and creativity, a model of the art-room, that was allowed to be designed in any way that the students wanted, was asked to be made. These methods were used to assess, and double-check the features that were controlled by one of the methods.

Among previously discussed results that should be satisfied in the art-room, were features related to the learning environment, such as, being a place where improvement in education and the quality of the environment are integrated. It should tell the students to investigate, experiment, explore their environment, and play, as these are the stimulants of creativity, and raise the quality of the space, functionally and aesthetically (Colven, 1990). Equipment and spaces for the students should be provided to encourage students to engage in exploratory activities (Winslow, 1990), and opportunities for a wide range of activities should be provided in the learning environment, in order to fit changing needs.

In the learning environment, educators should think of motivating the students and establishing an understanding of learning for its own sake. Classes which are most remembered are the ones in which the individual has learned with confidence, comfort,

and fun. The influences of the environment are reflected upon our lives, and thus, the task of designing the environment must be handled with utmost care and responsibility.

Interior designers can contribute to the development of children very effectively, and therefore, research in the areas of learning environments and the influences of these environments on children must be further elaborated.

The results of the study approved that the physical characteristics of the art-room environment were effective on the creativity of the students, in addition to the general well-being. In this study, different advantages were found for both grouping and flexibility that are two organizational characteristics inside the learning environment supporting creativity. Grouping helps to bring together students and provides interaction between the students and exchange of ideas, and this sets the ground for creativity. On the other hand, flexibility enables choice in different working styles, individual or in groups, according to changing moods and needs of the children, projects, and curriculum. When the environment provides for different needs of the users of the learning environment, the students feel free to explore and interact with the environment, feel that they are valued, feel that they are allowed to do different things that they need not be ashamed of, and thus, feel more confident about themselves. These factors establish the ground for creativity to flourish on.

This research that has been carried out in two sixth grade art-rooms, and states that different characteristics of learning environments that have been designed according to the organizational patterns of grouping and flexibility have influences on creativity. The

combination of certain characteristics that are existent in both types of organizations have been explained throughout the study. An environment that satisfies these characteristics will provide a learning environment that works fully to enhance creativity. The important thing is to provide this ground without restrictions and let the students develop their abilities by trial and error, and without fear. As the fear of restrictions, and making mistakes starts to diminish, the children will feel free to explore, learn and remember, and allow into their minds the wild ideas that will last and help them in all stages of their lives.



BIBLIOGRAPHY

- Abbs, Peter. 1989. *A is for Aesthetic: Essays on Creative and Aesthetic Education*. Philadelphia: The Falmer Press.
- Abeson, Alan and Julie Blacklow, eds. 1971. *Environmental Design: New Relevance for Special Education*. Arlington, VA: The Council for Exceptional Children.
- Academic Computing Consulting, Stanford University. "Flexible Class Lab." (1998). Online. Available: <http://rits.stanford.edu/rooms/flexlab/>. 13 May 1998.
- Achilles, Charles M. 1996. "Students Achieve More in Smaller Classes." *Educational Leadership*. 53.5: 76-77.
- Adamson, Roger D. 1998. *Classroom Lighting and Pupil Achievement*. PhD. Dissertation. University of Missouri 1991. Ann Arbor, MI: UMI.
- Aiken, Lewis R. 1994. *Psychological Testing and Assessment*. 8th ed. Needham Heights, MA: Allyn and Bacon.
- Albert, Robert S. 1990. "Identity, Experiences, and Career Choice Among the Exceptionally Gifted and Eminent." *Theories of Creativity*. Eds. Mark A. Runco and Robert S. Albert. London: Sage Publications. 13-34.
- Alter, Judith B. 1991. "Experiencing Creating and Creativity in the Classroom." *Journal of Creative Behavior*. 25.2: 162-168.
- Amabile, Theresa M. 1990. "Within You, Without You: The Social Psychology of Creativity, and Beyond." *Theories of Creativity*. Eds. Mark A. Runco and Robert S. Albert. London: Sage Publications. 61-91.
- . 1996. *Creativity in Context*. Boulder, CO: Westview Press, Inc.
- American Montessori Society. "Frequently Asked Questions." (1998a). Online. Available: <http://www.careguide.net/ams/faq.html>. 7 December 1998.
- . "The Montessori Method." (1998b). Online. Available: <http://www.careguide.net/ams/method.html>. 14 April 1999.
- Anderson, Gary J. and Herbert J. Walberg. 1974. "Learning Environments." *Evaluating Educational Performance: A Sourcebook of Methods, Instruments, and Examples*. Berkeley, CA: McCutchan Publishing Company.

- Antonietti, Alessandro. 1997. "Unlocking Creativity." *Educational Leadership*. 54. 6: 73.
- Antoniades, Anthony C. 1992. *Architecture and Allied Design: An Environmental Design Perspective*. Dubuque, IA: Kendall/ Hunt Publishing Company.
- Arends, Richard I. 1991. *Learning to Teach*. NY: McGraw-Hill, Inc.
- Aschbacher, Pamela. 1996. "A FLARE for the Arts." *Educational Leadership*. 53. 8: 40-43.
- Baer, John. 1993a. *Creativity and Divergent Thinking: A Task Specific Approach*. Hillsdale, NJ: Lawrence Erlbaum Associates Inc., Publishers.
- . 1993b. "Why You Shouldn't Trust Creativity Test." *Educational Leadership*. 51.4: 80-84.
- Bailin, Sharon. 1994. *Achieving Extraordinary Ends: An Essay on Creativity*. Norwood, NJ: Ablex Publishing Corporation.
- Baird, John C. and Anthony D. Lutkus. 1982. "From Spatial Perception to Architectural Construction." *Mind Child Architecture*. Hanover, NH: University Press of New England. 3-20.
- Barnes, Rob. 1993. *Art, Design and Topic Work 8-13*. NY: Routledge.
- Barton, Melvin and David Mishkin. 1984. "Ratings of Experimental Play and Learning Settings for Emotionally Disturbed and Mentally Retarded Children." *Institutional Settings: An Environmental Design Approach*. Ed. Joanna Tamer. NY: Human Sciences Press, Inc. 141-171.
- Basadur, Min. 1993. "Impacts and Outcomes of Creativity in Organizational Settings." *Nurturing and Developing Creativity: The Emergence of a Discipline*. Eds. Scott G. Isaksen, Mary C. Murdock, Roger L. Firestien, and Donald J. Treffinger. Norwood, NJ: Ablex Publishing Corporation. 278-314.
- Basadur, Min, Simon Taggar, and Pam Pringle. 1999. "Improving the Measurement of Divergent Thinking Attitudes in Organizations." *The Journal of Creative Behavior*. 33. 2: 75-111.
- Besemer, Susan P. and Karen O'Quin. "Assessing Creative Products: Progress and Potentials." 1993. *Nurturing and Developing Creativity: The Emergence of a Discipline*. Eds. Scott G. Isaksen, Mary C. Murdock, Roger L. Firestien, and Donald J. Treffinger. Norwood, NJ: Ablex Publishing Corporation. 331-350.
- Bingler, Steven. 1998. "Building a Learning Community." *Techniques: Making Education and Career Connections*. 73.2: 12-16.

- Boden, Margaret A., ed. 1996. "What is Creativity?" *Dimensions of Creativity*. Cambridge, MA: The MIT Press.
- Bucko, Richard. "Toward a Brain Compatible Elementary School." *Classroom Leadership Online*. 2.3 (1998):1-4. Online. Available: <http://www.ascd.org/pubs/cl/1nov98.html>. 2 October 1999.
- Burgess, Sylvia. 1998. "Effects of Group Composition on Individual Learning/ Performance in Design and Technology: A Case Study Approach." *The Journal of Design and Technology Education*. 3.3: 201-208.
- Cafoglu, Zuhul. 1992. "Sınıf Yönetimi." *Eğitim Dergisi*. 1. 2: 152-160.
- Carey, Nancy. 1995. *Arts Education in Public and Elementary Schools: Statistical Analysis Report*. Rockville, MD: Westat Inc.
- Chapman, Russ. 1998. "The Arts Improve Student Performance." *The Education Digest*. 63. 8: 59-60.
- Cheung, Tak and Garth F. Petrie. "The Brain Learns Better in Well-Designed School Environments." *Classroom Leadership Online*. 2.3 (1998): 1-3. Online. Available: <http://www.ascd.org/pubs/cl/2nov98.html>. 10 September 1999.
- Colven, Ronald, ed. 1990. Programme on Educational Building. *The Quality of the Physical Environment of the School and the Quality of Education*. Paris: Organisation for Economic Co-operation and Development.
- "Commentary." 1998. *American School and University*. 70.12: 18-19.
- Cramond, Bonnie. 1994. "We Can Trust Creativity Tests." *Educational Leadership*. 52.2: 70-72.
- Curtis, Paul and Roger Smith. 1975. "A Child's Exploration of Space." *Learning Environments*. Eds. Thomas G. David and Benjamin D. Wright. Chicago: The University of Chicago Press. 145-153.
- Dacey, John S. 1989. *Fundamentals of Creative Thinking*. NY: Lexington Books; An Imprint of Macmillan, Inc.
- David, Thomas G. and Benjamin D. Wright, eds. 1975. *Learning Environments*. Chicago: The University of Chicago Press.
- David, Thomas G. 1982. "Functional Dimensions of Classroom Environments." 1982. *Mind Child Architecture*. Hanover, NH: University Press of New England. 174-194.

- Dean, Jodi and Ila Lane Gross. 1992. "Teaching Basic Skills Through Art and Music." *Phi Delta Kappan*. 73.8: 613-618.
- DeBono, Edward. 1993. *Serious Creativity: Using the Power of Lateral Thinking to Create New Ideas*. London: Harper Collins Publishers.
- DeMitchell, Todd and Georgia M. Kerns. 1997. "Where To Educate Rachel Holland: Does Least Restrictive Environment Mean No Restrictions?" *The Clearing House*. 70.3: 161-166.
- Denel, Bilgi. 1981. *Temel Tasarım ve Yaratıcılık*. Ankara: O.D.T.Ü. Mimarlık Fakültesi Basım İşliği.
- DeYoung, Alan John. 1977. "Classroom Climate and Class Success: A Case Study at the University Level." *The Journal of Educational Research*. 70.5: 252-257.
- Domenech, Daniel A. 1999. "Flexibly Grouped Primary Grades Teach Reading and Math." *The Education Digest*. 64.8: 15-17.
- Ediger, Marlow. 1998. "Measuring How Much Students Have Learned." *Education*. 118.3: 406-416.
- Edwards, Carolyn Pope, Doris J. Shallcross, and Julie Maloney. 1991. "Enhancing Creativity in a Graduate Class on Creativity: Entering the Time and Space of the Young Child." *Journal of Creative Behavior*. 25.4: 304-310.
- Edwards, Carolyn Pope and Kay Wright Springate. December, 1995. "Encouraging Creativity in Early Childhood Classrooms." ERIC Clearinghouse on Elementary and Early Childhood Education, Urbana, IL.
- Eisner, Elliot W. 1992. "The Misunderstood Role of the Arts in Human Development." *Phi Delta Kappan*. 73.8: 591-595.
- Entwistle, N. J. 1991. "Approaches to Learning and Perceptions of the Learning Environment." *Higher Education*. 22: 201-204.
- Erwin, T. Dary. 1991. *Assessing Student Learning and Development: A Guide to Principles, Goals, and Methods*. San Francisco, CA: Jossey-Bass Publishers. 1991.
- Eysenck, Hans J. 1996. "The Measurement of Creativity." Ed. Margaret A. Boden. *Dimensions of Creativity*. Cambridge, MA: The MIT Press.
- Fatt, James Poon Teng. 1998. "Innovative Teaching At Its Best." *Education*. 118.4:616-625.

- Feldhusen, John F. 1995. "Creativity: A Knowledge Base, Metacognitive Skills, and Personality Factors." *Journal of Creative Behavior*. 29.4: 255-268.
- Fernald, Lloyd W. Jr., and Pam Nickolenko. 1993. "The Creative Process: Its Use and Extent of Formalization by Corporations." *Journal of Creative Behavior*. 27.3: 214-220.
- Firestien, Roger L. 1993. "The Power of the Product." *Nurturing and Developing Creativity: The Emergence of a Discipline*. Eds. Scott G. Isaksen, Mary C. Murdock, Roger L. Firestien, and Donald J. Treffinger. Norwood, NJ: Ablex Publishing Corporation. 270-275.
- Fischer, Gerhard. 1993. "Creativity Enhancing Design Environments." *Modeling Creativity and Knowledge-Based Design*. Eds. John S. Gero and Mary Lou Maher. NJ: Lawrence Erlbaum Associates. 235-257.
- Fogarty, Robin. 1998. "The Intelligence Friendly Classroom: It Just Makes Sense." *Phi Delta Kappan*. 79.9: 655-658.
- Folds, Vicki. "Minute to Minute Learning." *Care Guide*. (1998). Online. Available: <http://www.careguide.net/careguide.cgi/columns/ccolumn.html?&state=foldsjuly98>. 7 October 1999.
- Fraser, Barry J. 1982. "Development of Short Forms of Several Classroom Environment Scales." *Journal of Educational Measurement*. 19.3: 221-227.
- Fraser, B. J. and D. L. Fisher. 1983. "Student Achievement as a Function of Person-Environment Fit: A Regression Surface Analysis." *Journal of Educational Psychology*. 53: 89-99.
- Fraser, Barry J. 1991. "Two Decades of Classroom Environment Research." *Educational Environments: Evaluation, Antecedents, and Consequences*. NY: Pergamon Press. 3-28.
- Fraser, Barry J. and Theo Wubbels. 1995. "Classroom Learning Environments." *Improving Science Education*. Eds. Barry J. Fraser and Herbert J. Walberg. 117-144.
- Freiberg, H. Jerome. 1998. "Measuring School Climate: Let Me Count the Ways." *Educational Leadership*. 56.1: 22-26.
- Gardner, Howard. 1982. *Art, Mind, Brain: A Cognitive Approach to Creativity*. New York: Basic Books, Inc., Publishers.
- . 1985. *Frames of Mind: The Theory of Multiple Intelligences*. NY: Basic Books Inc.

- . 1996. "The Creators' Patterns." *Dimensions of Creativity*. Ed. Margaret A. Boden. Cambridge, MA: The MIT Press. 143-158.
- George, Jack. 1995. "A Loft-Y Idea for Learning." *Educational Leadership*. 53.3: 56-57.
- Gilbert, Faye W. and Penelope J. Penschaw. 1996. "A Preliminary Assessment of the Effectiveness of Creativity Training in Marketing." *Journal of Marketing Education*. 18.3: 46.
- Godfrey, Robert. 1992. "Civilization, Education, and the Visual Arts: A Personal Manifesto." *Phi Delta Kappan*. 73.8: 596-600.
- Goldberg, Merryl R. 1992. "Expressing and Assessing Understanding Through the Arts." *Phi Delta Kappan*. 73.8: 619-623.
- Gönen, Mübeccel and Necla Buluç. 1997. *Yaratıcılık ve Özellikleri*. Ankara: Atatürk Teknik, Anadolu Meslek, ve Meslek Lisesi.
- Guilford, Paul J. 1957. *Way Beyond the IQ*. Buffalo, NY: Bearly.
- . 1968. *Intelligence, Creativity, and Their Educational Implications*. San Diego, CA: Robert R. Knapp Publications.
- . 1972. "Creativity: Yesterday, Today, and Tomorrow". *Learning Environments: Readings in Educational Psychology*. Eds. William J. Gragey, Patricia A. Cheesebro, and James J. Johnson. NY: Holt, Reinhart, Winston. 118-128.
- . 1976. "Creativity: Its Measurement and Development". *Assessing Creative Growth: The Tests and Measured Changes*. Eds. A. Biondi and S. J. Parnes. Buffalo, NY: Bearly.
- Gullo, Dominic F. 1984. *Understanding Assessment and Evaluation in Early Childhood Education*. NY: Teachers College Press.
- Gundry, Lisa K. and Jill R. Kickul. 1996. "Flights of Imagination: Fostering Creativity Through Experiential Learning." *Simulation and Gaming*. 27.3: 334.
- Haensly, Patricia A. and E. Paul Torrance. 1990. "Assessment of Creativity in Children and Adolescents." *Handbook of Psychological and Educational Assessment of Children: Intelligence and Achievement*. Ed. Cecil R. Reynolds and Randy W. Kamphaus. NY: The Guilford Press.
- Hanna, Judith Lynne. 1992. "Connections: Arts, Academics, and Productive Citizens." *Phi Delta Kappan*. 73.8: 601-607.

- Hanson, Henry L. 1985. *Managing Creative Assets*. Edina, MN: Chiefton Publishing.
- Harms, Thelma. "The Early Childhood Environment Rating Scales." Online. Available: <http://www.fpg.unc.edu/~ecers/index.htm>. 17 August 1999.
- Hawkins, Harold L. 1997. "Good Classroom Design Improves Learning." *School Planning and Management*. 36.4: 10-12.
- Hays, Joan. 1989. "Creative Activity as a Scholarly Equivalent." *Thought and Action*. 5.2: 103-112.
- Hebert, Elizabeth A. 1998. "Design Matters: How School Design Affects Children." *Educational Leadership*. 56.1: 69-71.
- Heller, Robert W. 1968. "Informal Organization and Perceptions of the Organizational Climate of Schools." *The Journal of Educational Research*. 61.9: 405-411.
- Hertzberger, Herman. 1980. "Shaping The Environment." *Architecture for People: Explorations in a New Humane Environment*. Ed. Byron Mikellides. NY: Holt, Rinehart, and Winston.
- Holbein, Marie F. Doan. 1998. "Will Standards Improve Student Achievement?" *Education*. 118.4: 559-563.
- Hopkins, Mike. 1993. "Rethinking Class Design: Innovative Learning Environments Foster Innovative Teaching." *Instructor*. 103.1: 44-49.
- Isaksen, Scott G., Mary C. Murdock, Roger L. Firestien, and Donald J. Treffinger, eds. 1993a. *Nurturing and Developing Creativity: The Emergence of a Discipline*. Norwood, NJ: Ablex Publishing Corporation. 1-7.
- Isaksen, Scott G., Gerard J. Puccio, and Donald J. Treffinger. 1993b. "An Ecological Approach to Creativity Research: Profiling for Creative Problem Solving." *Journal of Creative Behavior*. 27. 3: 149-170.
- Jacklin, Angela and Colin Lacey. 1997. "Gender Integration in the Infant Classroom." *British Educational Research Journal*. 23. 5: 623-640.
- Johnson, David W. and Roger T. Johnson. 1991. "Cooperative Learning and Classroom and School Climate." *Educational Environments: Evaluation, Antecedents, and Consequences*. NY: Pergamon Press.
- Johnson, William L., Annabel M. Johnson, and Kurt Zimmerman. 1996. "Assessing School Climate Priorities: A Texas Study." *The Clearing House*. 70.2: 64-66.

- Jones, Les. 1993. "Barriers to Creativity and Their Relationship to Individual, Group, and Organizational Behavior." *Nurturing and Developing Creativity: The Emergence of a Discipline*. Eds. Scott G. Isaksen, Mary C. Murdock, Roger L. Firestien, and Donald J. Treffinger. Norwood, NJ: Ablex Publishing Corporation. 133-154.
- Joyce, Malcolm, Keith Franklin, and Penny Neale. 1998. "What Stimulates the Creative Process?" *The Journal of Design and Technology Education*. 3.2: 113-116.
- Kawenski, Mary. 1991. "Encouraging Creativity in Design." *Journal of Creative Behavior*. 25.3: 263-266.
- Kohn, Alfie. 1996. "What To Look For In A Classroom." *Educational Leadership*. 54.1: 54-55.
- Kowalski, Theodore J. 1989. *Planning and Managing School Facilities*. NY: Prager Publishers.
- Lackney, Jefferey A. 1994. *Educational Facilities: The Impact and Role of the Physical Environment of the School on Teaching, Learning, and Educational Outcomes*. Milwaukee, Wisconsin: Publications in Architecture and Urban Planning, Center for Architecture and Urban Planning Research.
- Livingstone, Linda P. and Debra L. Nelson. 1994. "Person-Environment Fit and Creativity: An Examination of Supply-Value and Demand-Ability Versions of Fit." *Journal of Management*. 23. 2: 119-147.
- Lowenfeld, Viktor. 1975. *Creative and Mental Growth*. 3rd ed. NY: Macmillan.
- MacKenzie, Donald G. 1989. *Planning Educational Facilities*. Lanham, MD: University Press of America.
- May, Rollo. 1980. *The Courage to Create*. NY: W. W. Norton and Company, Inc.
- Marjoribanks, Kevin. 1991. "Families, Schools, and Students' Educational Outcomes." *Educational Environments: Evaluation, Antecedents, and Consequences*. NY: Pergamon Press.
- McCann, Maria. "The Creativity/ IQ Interface: Old Answers and Some New Questions." Online. Available: <http://www.Tased.edu.au/tasonline/tag/aaegt7/mccann.htm>. 23 June 1998.
- McQuillan, Patrick J. and Donna E. Muncey. 1998. "Considerations in Implementing School-Within-a-School Restructuring." *The High School Magazine*. 6.2: 20-25.

- McLaughlin, Sally. 1993. "Emergent Value in Creative Product: Some Implications for Creative Processes." *Modeling Creativity and Knowledge-Based Design*. Eds. John S. Gero and Mary Lou Maher. NJ: Lawrence Erlbaum Associates. 43-90.
- Meagher, Judy. 1990. "Classroom Design That Works Every Time! Set Up Your Classroom To Create An Effective Learning Environment." *Instructor*. 106.1: 70-74.
- Meisels, Samuel J. 1996-1997. "Using Work Sampling in Authentic Assessments." *Educational Leadership*. 54.4:60-65.
- Michaelis, John U, Ruth H. Grossman, and Lloyd F. Scott. 1975. *New Designs for Elementary Curriculum and Instruction*. 2nd ed. NY: Mc Graw-Hill Book Company.
- Midgely, Carol, Jacquelynne S. Eccles, and Harriet Feldlaufer. 1991. "Classroom Environment and the Transition to Junior High School." *Educational Environments: Evaluation, Antecedents, and Consequences*. NY: Pergamon Press.
- Ministry of National Education of Turkey. 1997. *Basic Education Pilot Project/ Project Management Team*. General Directorate of Primary Education. Ankara.
- Moore, Gary T. 1994. *Early Childhood Physical Environment Observation Schedules and Rating Scales*. 2nd ed. Wisconsin, Milwaukee: Publications in Architecture and Urban Planning, Center for Architecture and Urban Planning Research.
- Moore, Gary T. and Jeffery A. Lackney. 1994. *Educational Facilities for the Twenty-First Century: Research Analysis and Design Patterns*. Wisconsin, Milwaukee: Publications in Architecture and Urban Planning, Center for Architecture and Urban Planning Research.
- Moos, Rudolph H. 1979. *Evaluating Educational Environments*. San Francisco, CA: Josey-Bass, Inc., Publishers.
- . 1984. "Context and Coping: Toward a Unifying Conceptual Framework." *Journal of Community Psychology*. 12: 5-25.
- . 1987. "Person-Environment Congruence in Work, School, and Health Care Settings." *Journal of Vocational Behavior*. 31: 231-247.
- Nageotte, Jim, ed. 1998. *Advances in Cross-Cultural Assessment*. Thousand Oaks, CA: SAGE Publications, Inc.

- Nielsen, H. Dean and Diana H. Kirk. 1974. "Classroom Climates." *Evaluating Educational Performance: A Sourcebook of Methods, Instruments, and Examples*. Berkeley, CA: McCutchan Publishing Company. 79-92.
- Noschis, Kaj. 1982. "The Child in the Laboratory: Not Just Conforming to Prompts." *Mind Child Architecture*. Hanover, NH: University Press of New England. 139-158.
- Oosterhof, Albert. 1994. *Classroom Applications of Educational Measurement*. 2nd ed. NY: Merrill, An Imprint of Macmillan Publishing Company.
- Organisation for Economic Co-operation and Development, Programme on Educational Building 1. 1973. *School Building To-day and To-morrow*. Paris: Organisation for Economic Co-operation and Development Publishing.
- Organisation for Economic Co-operation and Development. 1975. *Programme on Educational School Building and Educational Change*. Paris: Organisation for Economic Cooperation and Development.
- Organisation for Economic Co-operation and Development, Programme on Educational Building. 1976. *Providing for Future Change: Adaptability and Flexibility in School Building*. Paris: Organisation for Economic Cooperation and Development.
- Ormrod, Jeanne Ellis. 1990. *Human Learning: Theories, Principles, and Educational Applications*. NY: Merrill Publishing Company.
- Pantano, Phil. "Flexible Spaces That Work: Renovating Today for Tomorrow's Needs". *School Planning and Management*. Online. Available: <http://www.spmmag.com/articles/1999-01-Jan/Flexible-Spaces.html>. 6 January 1999.
- Pool, Carolyn R. 1997. "Maximizing Learning: A Conversation With Renate Nummela Caine." *Educational Leadership*. 54.6:11-15.
- Propst, Robert. 1975. "Human Needs and Working Places." *Learning Environments*. Eds. Thomas G. David and Benjamin D. Wright. Chicago: The University of Chicago Press. 83-90.
- Proshansky, Etta and Maxine Wolfe. 1974. "The Physical Setting and Open Education." *School Review*. 82.5: 619-23.
- Puckett, Margaret B. and Janet K. Black. 1994. *Authentic Assessment of the Young Child: Celebrating Development and Learning*. NY: Merrill, An Imprint of Macmillan College Publishing Company.

- Rasmussen, Karen. "Arts Education – A Cornerstone of Basic Education." *Classroom Leadership Online*. Spring 1998. Online. Available: <http://www.ascd.org/pubs/cu/spring98cu.html>. 15 March 1999.
- Raw, James S. and Kevin Marjoribanks. 1991. "Family and School Correlates of Adolescents' Creativity, Morality, and Self-Concept." *Educational Studies*. 17. 2: 183-190.
- Raudenbush, Stephen W. 1990. "New Evidence in the Search for Effective Primary Schools." *American Journal of Education*. 98.2: 175-183.
- Ritson, John E. and James A. Smith. 1975. *Creative Teaching of Art in the Elementary School*. Boston: Allyn and Bacon.
- Rose, Mary. 1990. "So Much To Do, So Little Time: Preparations for Setting Up a Classroom" *Instructor*. 108. 1: 58-61.
- Runco, Mark A. 1991. "The Evaluative, Valuative, and Divergent Thinking of Children." *The Journal of Creative Behavior*. 25.4: 311-319.
- . 1994. "Creativity and its Discontents." *Creativity and Affect*. Eds. Melvin P. Shaw and Mark A. Runco. Norwood, NJ: Ablex Publishing Corporation. 102-126.
- Russ, Sandra W. 1993. *Affect and Creativity: The Role of Affect and Play in the Creative Process*. Hillsdale, NJ: Lawrence Erlbaum Association, Publishers.
- Sallis, James F., Marilyn F. Johnson, Karen J. Calfas, Susan Caparosa, and Jeanne F. Nichols. 1997. "Assessing Perceived Physical Environmental Variables That May Influence Physical Activity." *Research Quarterly for Exercise and Sport*. 68.4: 345-352.
- Sapp, David D. 1999. "Creative Problem-Solving in Art: A Model for Idea Inception and Image Development." *Journal of Creative Behavior*. 29.3:173-185.
- Sautter, Craig R. 1994. "An Arts Education Reform Strategy". *Phi Delta Kappan*. 75. 6: 432-437.
- Segal, Julius and Zelda Segal. 1990. "Kindle the Creative Spark.." *Parents' Magazine*. 65.2: 77-81.
- . 1994. "The Creative Child." *Parents' Magazine*. 64.2: 178-179.
- Segiovanni, Thomas J. 1995. "Small Schools, Great Expectations." *Educational Leadership*. 53.3: 48-52.

- Short, Paula M. and John T. Greer. 1994. "Empowering Students: Variables Impacting the Effort." *Education*. 114. 4: 503-516.
- Shwartz, S. and M. Pollishuke. 1991. *Creating the Child-Centered Classrooms*. Katonah, Richard C. Owen Publishing, Inc.
- Slabbert, Johannes A. 1994. "Creativity in Education Revisited: Reflection in Aid of Progression." *Journal of Creative Behavior*. 28.1: 60-69.
- Sloane, Marie W. 1998. "Engaging Primary Students: Learning Resource Centers." *Childhood Education*. 75.2: 76-83.
- Smith, Mary Ann. 1998. "Learning to Reflect." *The Clearing House*. 72.1: 24-27.
- Snyder, Lorraine. 1984. "Archetypal Place and The Needs of the Aging." *Institutional Settings: An Environmental Design Approach*. Ed. Joanna Tamer. NY: Human Sciences Press, Inc. 53-65.
- Spivack, Mayer. 1975. "Designing for Exceptional Children." *Learning Environments*. Eds. Thomas G. David and Benjamin D. Wright. Chicago: The University of Chicago Press. 121-139.
- Sternberg, Robert J. 1990. *Metaphors of Mind: Conceptions of the Nature of Intelligence*. NY: Cambridge University Press.
- . 1995-1996. "Investing in Creativity: Many Happy Returns". *Educational Leadership*. 53. 4: 80-84.
- Sternberg, Robert J. and T. I. Lubart. 1995. *Defying the Crowd: Cultivating Creativity in a Culture of Conformity*. NY: Free Press.
- Stone, Nancy J. and Anthony J. English. 1998. "Task Type, Posters, and Workspace Color on Mood, Satisfaction, and Performance." *Journal of Environmental Psychology*. 18.2: 175-185.
- Strong, Richard, Harver F. Silver, and Amy Silver. 1995. "What Do Students Want and What Really Motivates Them?" *Educational Leadership*. 53.1: 8-13.
- Taylor, Anne. 1993. "How Schools are Redesigning Their Space." *Educational Leadership*. 51.1: 36-42.
- "The Top Ten Design Ideas for Schools of the 21st Century." 1998. *American School and University*. 70.5: 11-29.

- Torff, Bruce. 1997. "Assessing Multiple Intelligences." *Multiple Intelligences and Assessment: A Collection of Articles*. Arlington Heights, IL: SkyLight Training and Publishing, Inc. vi-x.
- Torrance, E. Paul. 1970. *Encouraging Creativity in the Classroom*. Dubuque, IA: Wm. C. Brown Company Publishers.
- Treffinger, Donald J. 1993. "Stimulating Creativity: Issues and Future Directions." *Nurturing and Developing Creativity: The Emergence of a Discipline*. Eds. Scott G. Isaksen, Mary C. Murdock, Roger L. Firestien, and Donald J. Treffinger. Norwood, NJ: Ablex Publishing Corporation. 8-30.
- Trogler, George E. 1972. *Beginning Experiences in Architecture*. NY: Van Nostrand Reinhold Company.
- Walberg, Herbert J., Juanita Sorenson, and Thomas Fischbach. 1972. "Ecological Correlates of Ambience in the Learning Environment." *American Educational Research Journal*. 9.1: 139-148.
- Walberg, Herbert J. 1969. "Class Size and the Social Environment of Learning." *Human Relations*. 22. 5: 465-475.
- . 1991. "Educational Productivity and Talent Development." *Educational Environments: Evaluation, Antecedents, and Consequences*. NY: Pergamon Press. 93-112.
- Walberg, Herbert J. and Rebecca C. Greenberg. 1997. "Using the Learning Environment Inventory." *Educational Leadership*. 54.8: 45-46.
- Walsh, Bruce W. and Nancy E. Betz. 1995. *Tests and Assessment*. 3rd ed. Englewood Cliffs, NJ: Prentice Hall, Inc.
- Ward, Thomas B., Ronald A. Finke, and Steven M. Smith. 1995. *Creativity and the Mind: Discovering the Genius Within*. NY: Plenum Press.
- Wasserstein, Paulette. 1995. "What Middle Schoolers Say About Their Schoolwork." *Educational Leadership*. 53.1: 41-43.
- Wechsler, Solange. 1993. "Issues on Stimulating Creativity in the Schools: A South American Perspective." *Nurturing and Developing Creativity: The Emergence of a Discipline*. Eds. Scott G. Isaksen, Mary C. Murdock, Roger L. Firestien, and Donald J. Treffinger. Norwood, NJ: Ablex Publishing Corporation. 100-132.
- Weinstein, Claire Ellen. 1996. "Learning How to Learn: An Essential Skill for the 21st Century." *Educational Record*. 77.4: 49-52.

“What Makes Outstanding Projects.” 1996. *American School and University*. 69.3: 14-15.

Windel International/ Weyel, Division of ICA Corp. “Classroom Design Principles That Improve Teaching and Learning.” (1998a). Online. Available: <http://classrooms.com/principles.html>. 7 December 1998.

---. “Guidelines and Specifications.” (1998c). Online. Available: <http://classrooms.com/guidelines.html>. 8 April 1999.

---. “Tips for Better Classrooms.” (1998c): 1-4. Online. Available: <http://tips-classrooms.html>. 13 Mar. 1999.

Winslow, Margaret Cottom. 1990. *Environmental Design: The Best of Architecture and Technology*. NY: PBC International, Inc.

Wubbels, Theo, Jack Levy, and Mieke Brekelmans. 1997. “Paying Attention to Relationships.” *Educational Leadership*. 54. 7: 82-86.

Yıldırım, Ali. 1996. “Promoting Skills in the Classroom: Teachers’ Attitudes and Their Implications.” *Çukurova Üniversitesi Eğitim Fakültesi Dergisi*. 2. 14: 63-69.

Yıldırım, Cemal. 1973. *Eğitimde Ölçme ve Değerlendirme*. İstanbul: Milli Eğitim Basımevi.

Yong, Leonard M. S. 1994. “Managing Creative People.” *Journal of Creative Behavior*. 28.1: 16-20.

Zeki, Semir. 1999. “Art and the Brain.” *Journal of Consciousness Studies*. 6.6-7: 76-96.

Zelanski, Paul and Mary Pat Fisher. 1987. *Shaping Space*. NY: Holt, Rinehart and Winston, Inc.

APPENDICES



APPENDIX A



Appendix A.1. The Students' Questionnaire

Name:
Sex:

Date:

STUDENTS' QUESTIONNAIRE

PERSON (BEFORE STARTING THE ACTIVITY, AFTER THE EXPLANATIONS):

- | | not at all | a fair
amount | very
much |
|---|------------|------------------|--------------|
| 1. Do you know what you want to do right now? (person, self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 2. Do you have different ideas in your mind right now about what you want to do in this activity? (person, originality - fluency) | 1__ | 2__ | 3__ 4__ 5__ |
| 3. Do you think you will be able to create an original art-work? (person, originality - self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 4. Are you feeling good right now? (person, sensitivity) | 1__ | 2__ | 3__ 4__ 5__ |
| 5. Is this an exciting project for you? (person, originality, self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 6. Is it important what your teacher says about your work? (person, self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 7. Do you have a good impression of your work in general? (person, self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 8. Do you generally have problems in concentrating on your work? (person, completion) | 1__ | 2__ | 3__ 4__ 5__ |
| 9. Are you going to give a break or rest after a while? (person, completion) | 1__ | 2__ | 3__ 4__ 5__ |
| 10. Do you think you will be able to finish the activity? (person, completion) | 1__ | 2__ | 3__ 4__ 5__ |
| 11. Are you worried about completing the activity? (person, self-courage - completion) | 1__ | 2__ | 3__ 4__ 5__ |
| 12. Do you like experiencing activities such as this one? (person, self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 13. Are you relaxed, calm? (person, control) | 1__ | 2__ | 3__ 4__ 5__ |
| 14. Do you think you are polite? (person, negativity) | 1__ | 2__ | 3__ 4__ 5__ |

PROCESS (DURING THE ACTIVITY):

- | | not at all | a fair amount | very much |
|---|------------|---------------|-------------|
| 1. Did you have a hard time starting your project? (process, self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 2. Are you having a good time working on your project? (process, completion) | 1__ | 2__ | 3__ 4__ 5__ |
| 3. Do you have any inspiration sources? (process, self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 4. Are the materials sufficient? (process, self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 5. Do you think you will have to think up of a new material? (process, originality) | 1__ | 2__ | 3__ 4__ 5__ |
| 6. Do you think you are making good use of the material at hand? (process, originality, self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 7. Do you prefer working alone or in a group? (person, isolation) | alone | both | group |
| 8. Why? | 1__ | 2__ | 3__ 4__ 5__ |

PRODUCT (AFTER THE ACTIVITY):

- | | | | | | |
|---|------------|-----|------------|-----|-------------|
| 1. Do you have a good impression of what you have made? (product, self-courage) | 1__ | 2__ | 3__ | 4__ | 5__ |
| 2. Did you elaborate on the details of your work? (assessment, elaboration) | 1__ | 2__ | 3__ | 4__ | 5__ |
| 3. How original, interesting do you think your work is? (product, originality) | 1__ | 2__ | 3__ | 4__ | 5__ |
| 4. Do you think there can be other solutions to this activity? (assessment, flexibility) | 1__ | 2__ | 3__ | 4__ | 5__ |
| 5. If yes, how many? (assessment, fluency) | 1__
1-3 | 2__ | 3__
3-5 | 4__ | 5__
5-10 |
| 6. Is there anything in this project that reflects your feelings or thoughts? (product, identification) | 1__ | 2__ | 3__ | 4__ | 5__ |

not at all a fair very
amount much

7. Did you depict anything belonging to you,
your friends, or teacher in this project?
(product, identification)

1__ 2__ 3__ 4__ 5__

8. Do you think this is the most appropriate
solution? (product, usefulness)

1__ 2__ 3__ 4__ 5__

9. Why?

10. Is this a solution which is novel for
you? (product, originality)

1__ 2__ 3__ 4__ 5__

11. Do you think this is a useful solution?
(product, usefulness, self-courage)

1__ 2__ 3__ 4__ 5__

12. Do you think it is successful?
(product, usefulness, self-courage)

1__ 2__ 3__ 4__ 5__

13. Could you have furthered your project
in different ways? (product, fluency)

1__ 2__ 3__ 4__ 5__

14. Could you have elaborated on your project?
(product, elaboration)

1__ 2__ 3__ 4__ 5__

15. What does the environment you designed
say to you? (product, message)

16. Do you think you could have been more creative
in the environment you designed? (product, message)

1__ 2__ 3__ 4__ 5__

17. Why?

ENVIRONMENT (BEFORE THE ACTIVITY):

1. Is your art-room a special
place for you? (environment, identification)

1__ 2__ 3__ 4__ 5__

2. Is your art-room pleasant
to look at? (environment, identification)

1__ 2__ 3__ 4__ 5__

3. Is your art-room a formal space?
(environment, flexibility)

1__ 2__ 3__ 4__ 5__

	not at all	a fair amount	very much	
4. Is your art-room a traditional space? (environment, flexibility)	1__	2__	3__	4__ 5__
5. Do you feel like your art-room belongs to you? (environment, identification)	1__	2__	3__	4__ 5__
6. Do you enjoy working in your art-room? (environment, maintenance)	1__	2__	3__	4__ 5__
7. Can you concentrate on what you are doing in your art-room? (environment, concentration)	1__	2__	3__	4__ 5__
8. Is the class organization comfortable? (environment, flexibility)	1__	2__	3__	4__ 5__
9. Can it be improved? (environment, flexibility)	1__	2__	3__	4__ 5__
10. Can you move freely in this space? (environment, flexibility)	1__	2__	3__	4__ 5__
11. Do you have enough space to work without others crowding you? (environment, flexibility)	1__	2__	3__	4__ 5__
12. Does your art-room have places where you can be alone if you want to? (environment, isolation)	1__	2__	3__	4__ 5__
13. Do you have a place of your own where you can keep your things in your art-room? (environment, identification)	1__	2__	3__	4__ 5__
14. If yes, can you fix it up the way you want? (environment, flexibility)	1__	2__	3__	4__ 5__
15. Are there lots of comfortable places in your art-room? (environment, flexibility)	1__	2__	3__	4__ 5__
16. Is your art-room always clearly organized? (environment, flexibility)	1__	2__	3__	4__ 5__
17. Can you sit wherever you want in your art-room? (environment, flexibility)	1__	2__	3__	4__ 5__
18. Do you spend your time in the art-room in one place? (environment, flexibility)	1__	2__	3__	4__ 5__
19. Do you get to add things to your art-room to make it better? (environment, contribution)	1__	2__	3__	4__ 5__
20. Can you move the equipment inside this space freely? (environment, flexibility)	1__	2__	3__	4__ 5__

	not at all	a fair amount	very much
21. Can you use the material in your art-room freely? (environment, flexibility)	1__	2__	3__ 4__ 5__
22. Do you have any responsibilities in your art-room? (environment, maintenance)	1__	2__	3__ 4__ 5__
23. Do you change the organization of your art-room from time to time? (environment, flexibility)	1__	2__	3__ 4__ 5__
24. If no, could you have changed it the way you wanted to? (environment, flexibility)	1__	2__	3__ 4__ 5__
25. Does the organization of the art-room effect your relations with other students? (environment, flexibility)	1__	2__	3__ 4__ 5__
26. Does the organization of the art-room effect your relations with the teacher? (environment, flexibility)	1__	2__	3__ 4__ 5__
27. Can you freely ask questions in this space? (environment, flexibility)	1__	2__	3__ 4__ 5__
28. Can you freely talk about your emotions in this space? (environment, flexibility)	1__	2__	3__ 4__ 5__
29. Are your projects effected by your art-room in any way? (environment, flexibility)	1__	2__	3__ 4__ 5__
30. Do you have a good impression about the lighting? (environment, design elements)	1__	2__	3__ 4__ 5__
31. Do you have a good impression about the quality of the air? (environment, design elements)	1__	2__	3__ 4__ 5__
32. Do you have a good impression about the colors? (environment, design elements)	1__	2__	3__ 4__ 5__
33. Did you ever feel inflexible in your art-room? (environment, flexibility)	1__	2__	3__ 4__ 5__
34. Do you contribute to the design of your art-room? (environment, maintenance)	1__	2__	3__ 4__ 5__
35. What does your art-room say to you? (environment, message)			

Appendix A.2. The Teachers' Questionnaire

Name:
Sex:

Date:

TEACHERS' QUESTIONNAIRE

PERSON (BEFORE STARTING THE ACTIVITY, AFTER THE EXPLANATIONS):

- | | not at all | a fair
amount | very
much |
|---|------------|------------------|--------------|
| 1. Do you think s/he knows what s/he wants to do right now? (person, sensitivity) | 1__ | 2__ | 3__ 4__ 5__ |
| 2. Do you think s/he has different ideas in her/ his mind about what s/he wants to do in this activity? (person, originality) | 1__ | 2__ | 3__ 4__ 5__ |
| 3. Do you think s/he will be able to create an original art-work? (person, originality-self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 4. Do you think s/he is feeling good right now? (person, sensitivity) | 1__ | 2__ | 3__ 4__ 5__ |
| 5. Do you think this is an exciting project for her/ him? (person, originality, self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 6. Does s/he worry about what you think about her/ his work? (person, self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 7. Do you think s/he has good ideas about her/ his work? (person, self-courage) | 1__ | 2__ | 3__ 4__ 5__ |
| 8. Does s/he give breaks while working? (person, completion) | 1__ | 2__ | 3__ 4__ 5__ |
| 9. Does s/he finish the activities you assign them? (person, completion) | 1__ | 2__ | 3__ 4__ 5__ |
| 10. Does s/he worry about the activities you assign them in the beginning?(person, completion) | 1__ | 2__ | 3__ 4__ 5__ |
| 11. Does s/he have problems in concentrating on her/his work? (person, completion) | 1__ | 2__ | 3__ 4__ 5__ |
| 12. Do you think s/he likes experiencing activities such as this one? (person, self-courage) | 1__ | 2__ | 3__ 4__ 5__ |

not at all a fair very
amount much

13. Is s/he relaxed, calm while solving activities? (person, control)

1__ 2__ 3__ 4__ 5__

14. Do you think s/he is polite? (person, negativity)

1__ 2__ 3__ 4__ 5__

PROCESS (DURING THE ACTIVITY):

1. Did s/he have a hard time starting the project? (process, self-courage)

1__ 2__ 3__ 4__ 5__

2. Is s/he having a good time working on the project? (process, completion)

1__ 2__ 3__ 4__ 5__

3. Do you think s/he has any inspiration sources? (process, self-courage)

1__ 2__ 3__ 4__ 5__

4. Are the materials sufficient for her/him? (process, self-courage)

1__ 2__ 3__ 4__ 5__

5. Do you think s/he will have to think up of a new material? (process, originality)

1__ 2__ 3__ 4__ 5__

6. Do you think s/he is making good use of the material at hand? (process, originality)

1__ 2__ 3__ 4__ 5__

7. Does s/he prefer working alone or in a group? (person, isolation)

alone both group
1__ 2__ 3__ 4__ 5__

8. Why?

PRODUCT (AFTER THE ACTIVITY):

1. Do you think s/he has good feelings about what s/he has made? (person, self-courage)

1__ 2__ 3__ 4__ 5__

2. Do you think s/he has elaborated on her/ his work? (product, elaboration)

1__ 2__ 3__ 4__ 5__

3. Could s/he have furthered the project in different ways? (product, fluency)

1__ 2__ 3__ 4__ 5__

4. Could s/he have elaborated on the project? (product, elaboration)

1__ 2__ 3__ 4__ 5__

	not at all	a fair amount	very much
5. How original, interesting do you think s/he sees her/ his work? (product, originality)	1__	2__	3__ 4__ 5__
6. How original, interesting is her/ his work? (product, originality)	1__	2__	3__ 4__ 5__
7. Could s/he have proposed other solutions to the activity? (product, flexibility)	1__	2__	3__ 4__ 5__
8. If yes, how many? (product, fluency)	1__ 1-3	2__	3__ 4__ 5__ 3-5 5-10
9. Is there anything in this project that reflects her/ his feelings or thoughts? (product, identification)	1__	2__	3__ 4__ 5__
10. Do you think s/he has depicted anything belonging to her/ him, her/ her friends, or you in this project? (product, identification)	1__	2__	3__ 4__ 5__
11. Do you think s/he has thought of the most appropriate solution? (product, usefulness)	1__	2__	3__ 4__ 5__
12. Why?			
13. Is this a solution which is novel for you? (product, originality)	1__	2__	3__ 4__ 5__
14. Do you think this is a useful solution? (product, usefulness, self-courage)	1__	2__	3__ 4__ 5__
15. Do you think her/his project is successful? (product, all creativity assessment characteristics)	1__	2__	3__ 4__ 5__
16. Do you think s/he thinks her/his project is successful? (product, all creativity assessment characteristics)	1__	2__	3__ 4__ 5__

ENVIRONMENT (BEFORE THE ACTIVITY):

1. Is your art-room a special place for you? (environment, identification)	1__	2__	3__	4__	5__
2. Is your art-room pleasant to look at? (environment, identification)	1__	2__	3__	4__	5__
3. Is your art-room a formal space? (environment, flexibility)	1__	2__	3__	4__	5__

	not at all	a fair amount	very much	
4. Is your art-room a traditional space? (environment, flexibility)	1__	2__	3__	4__ 5__
5. Do you feel like your art-room belongs to you? (environment, identification)	1__	2__	3__	4__ 5__
6. Do you enjoy working in your art-room? (environment, maintenance)	1__	2__	3__	4__ 5__
7. Do the students enjoy working in your art-room? (environment, maintenance)	1__	2__	3__	4__ 5__
8. Can you concentrate on what you are doing in your art-room? (environment, concentration)	1__	2__	3__	4__ 5__
9. Is the class organization comfortable? (environment, flexibility)	1__	2__	3__	4__ 5__
10. Can it be improved? (environment, flexibility)	1__	2__	3__	4__ 5__
11. Is the class organization comfortable for the students? (environment, flexibility)	1__	2__	3__	4__ 5__
12. Can it be improved for the students? (environment, flexibility)	1__	2__	3__	4__ 5__
13. Can you move freely in this space? (environment, flexibility)	1__	2__	3__	4__ 5__
14. Can the students move freely in this space? (environment, flexibility)	1__	2__	3__	4__ 5__
15. Do you have enough space to work without others crowding you? (environment, flexibility)	1__	2__	3__	4__ 5__
16. Does your art-room have places where you can be alone if you want to? (environment, isolation)	1__	2__	3__	4__ 5__
17. Do you have a place of your own where you can keep your things in your art-room? (environment, identification - personalization)	1__	2__	3__	4__ 5__
18. If yes, can you fix it up the way you want? (environment, flexibility)	1__	2__	3__	4__ 5__
19. Are there lots of comfortable places in your art-room? (environment, flexibility)	1__	2__	3__	4__ 5__
20. Is your art-room always clearly organized? (environment, flexibility)	1__	2__	3__	4__ 5__

	not at all	a fair amount	very much	
21. Can you sit wherever you want in your art-room? (environment, flexibility)	1__	2__	3__	4__ 5__
22. Do you spend your time in the art-room in one place? (environment, flexibility)	1__	2__	3__	4__ 5__
23. Do you get to add things to your art-room to make it better? (environment, contribution)	1__	2__	3__	4__ 5__
24. Can you move the equipment inside this space freely? (environment, flexibility)	1__	2__	3__	4__ 5__
25. Can the students move the equipment inside this space freely? (environment, flexibility)	1__	2__	3__	4__ 5__
26. Can you use the material in your art-room freely? (environment, flexibility)	1__	2__	3__	4__ 5__
27. Can the students use the material in your art-room freely? (environment, flexibility)	1__	2__	3__	4__ 5__
28. Do the students have any responsibilities in your art-room? (environment, maintenance)	1__	2__	3__	4__ 5__
29. Do you change the organization of your art-room from time to time? (environment, flexibility)	1__	2__	3__	4__ 5__
30. If no, could you have changed it the way you wanted? (environment, flexibility)	1__	2__	3__	4__ 5__
31. Does the organization of the art-room effect your relations with the students? (environment, flexibility)	1__	2__	3__	4__ 5__
32. Does the organization of the art-room effect the relations between the students? (environment, flexibility)	1__	2__	3__	4__ 5__
33. Can the students freely ask questions in this space? (environment, flexibility)	1__	2__	3__	4__ 5__
34. Can the students freely talk about their emotions in this space? (environment, flexibility)	1__	2__	3__	4__ 5__
35. Are the projects you assign effected by your art-room in any way? (environment, flexibility)	1__	2__	3__	4__ 5__
36. Are the solutions to projects assigned, effected by your art-room in any way? (environment, flexibility)	1__	2__	3__	4__ 5__

not at all	a fair amount	very much
------------	------------------	--------------

37. Do you have a good impression about the lighting? (environment, design elements)

1__ 2__ 3__ 4__ 5__

38. Do you have a good impression about the air quality? (environment, design elements)

1__ 2__ 3__ 4__ 5__

39. Do you have a good impression about the colors? (environment, design elements)

1__ 2__ 3__ 4__ 5__

40. Did you ever feel inflexible in your art-room? (environment, flexibility)

1__ 2__ 3__ 4__ 5__

41. Do the students contribute to the design of your art-room? (environment, maintenance)

1__ 2__ 3__ 4__ 5__

42. In what kind of environment could the children be more creative? (environment, design elements)

43. Why?

ASSESSMENT (AFTER THE OBSERVATION, QUESTIONNAIRE, AND ACTIVITY):

1. CREATIVITY ASSESSMENT

	not at all	a fair amount	very much
1. Flexibility (The student has stretched her/his imagination beyond conventional thought)	1__	2__	3__ 4__ 5__
2. Fluency (The student has created several solutions to a problem)	1__	2__	3__ 4__ 5__
3. Novelty (The student has brought about and used new concepts in her/his project)	1__	2__	3__ 4__ 5__
4. Originality (The student has created an art-work that is different from the other students)	1__	2__	3__ 4__ 5__
5. Elaboration (The student has thought about and used several details in the project)	1__	2__	3__ 4__ 5__
6. Ability to see deficiencies (The student has seen and completed in a creative way the parts of the project that have not been given)	1__	2__	3__ 4__ 5__
7. Ability to redefine (The student has redefined the materials, elements of the project)	1__	2__	3__ 4__ 5__
8. Open-ended solutions (The student has created a project that can be furthered in many different ways)	1__	2__	3__ 4__ 5__

2. ASSESSMENT OF DESIGN ELEMENTS

	poor	average	excellent
1. Line (2D+3D)	1__	2__	3__ 4__ 5__
2. Shape and Form (2D+3D)	1__	2__	3__ 4__ 5__
3. Space (2D+3D)	1__	2__	3__ 4__ 5__
4. Texture (2D+3D)	1__	2__	3__ 4__ 5__
5. Value (2D+3D)	1__	2__	3__ 4__ 5__

	poor	average			excellent
6. Color (2D+3D)	1__	2__	3__	4__	5__
7. Light (3D)	1__	2__	3__	4__	5__
3. ASSESSMENT OF UNIFYING PRINCIPLES					
1. Repetition	1__	2__	3__	4__	5__
2. Variety	1__	2__	3__	4__	5__
3. Rhythm	1__	2__	3__	4__	5__
4. Balance	1__	2__	3__	4__	5__
5. Emphasis	1__	2__	3__	4__	5__



APPENDIX B



Appendix B.1. The Observation of the Students

Name:
Sex:

Date:
School:

**CHARACTERISTICS OF THE CREATIVE AND NON-CREATIVE *PERSON*,
PROCESS, *PRODUCT*, AND *ENVIRONMENT* TO BE USED DURING THE
OBSERVATION IN THE ART-ROOM, AND THE FEATURES TO BE
CONSIDERED DURING THE *ANALYSIS* OF THE TASK**

1. CREATIVE PERSON (Discussed with the teacher)

CREATIVE – NON-CREATIVE

1. ORIGINALITY:

- ☐ Unconventional – conventional ☐
- ☐ Having wild, silly, unusual ideas - having down to earth, usual ideas ☐
- ☐ Radical - not radical ☐
- ☐ Scrambled mind – organized, common thinking ☐
- ☐ Complex – simple ☐
- ☐ Has the ability to fashion products – can not easily fashion products ☐

2. COMPLETION

- ☐ Goes to work quickly - spends time before getting to work ☐
- ☐ Will work until the completion of work - may leave work unfinished ☐
- ☐ Energetic, enthusiastic about work - not energetic, enthusiastic about work ☐
- ☐ Does not mingle with others - mingles with the whole class ☐

3. SELF - COURAGE

- ☐ Non conforming – conforming ☐
- ☐ Self sufficient - not self sufficient ☐
- ☐ Self accepting - self refusing ☐
- ☐ Egocentric – not egocentric ☐
- ☐ Egotistic – not egotistic ☐

- ☐ Secure – insecure ☐
- ☐ Emotionally mature - emotionally immature ☐
- ☐ Able to cope with abuse - can not cope with abuse ☐
- ☐ Self-centered - not self-centered ☐
- ☐ Does not ask for help - asks for help ☐
- ☐ Internally oriented – externally oriented ☐
- ☐ Willing to take risks - not willing to take risks ☐
- ☐ Adventurous - not adventurous ☐
- ☐ Takes a hopeful outlook when presented with complex tasks – panics when presented with complex tasks ☐
- ☐ Is able to change without being bound to habits – is reluctant in leaving habits ☐

4. SENSITIVITY

- ☐ Socially sensitive - socially ignorant ☐
- ☐ Emotionally sensitive - emotionally ignorant ☐
- ☐ Perceptive – not perceptive ☐
- ☐ Curious – not curious ☐
- ☐ Intuitive – not intuitive ☐

5. NEGATIVITY

- ☐ Inconsiderate of others - considerate of others ☐
- ☐ Oppositional – accepting
- ☐ Annoying – calm ☐
- ☐ Offensive – polite ☐
- ☐ Is not one of the best students – is one of the best students ☐

6. ISOLATION

- ☐ Isolated - not isolated ☐
- ☐ Withdrawn – extrovert ☐
- ☐ Low in sociability - high in sociability ☐
- ☐ Estranged - not estranged ☐
- ☐ Independent of judgement - dependent on judgement ☐
- ☐ Uncooperative – cooperative ☐

7. CONTROL

- ☐ Non defensive – defensive ☐
- ☐ Stable – unstable ☐
- ☐ Controlled - not controlled ☐

8. HUMOR

- ☐ Humorous - not humorous ☐
- ☐ Enjoy being child-like, playful – are less playful ☐
- ☐ Enjoy toying with, and making use of the environment – are more ignorant of the details of the environment ☐

2. CREATIVE PROCESS

CREATIVE – NON-CREATIVE

1. ORIGINALITY

- ☐ Enjoys challenge of finding different ways of solving problems – prefers conventional solutions ☐
- ☐ Adopts new perspectives – does not search for new perspectives ☐
- ☐ Makes good use of material at hand - does not make good use of material at hand ☐
- ☐ Invents new tools and media - does not think of inventing new tools and media ☐
- ☐ Not subject to group standards and control - subject to group standards and control ☐
- ☐ Does not follow models and examples - follows models and examples ☐
- ☐ Perfects a skill by copying - does not need to perfect skills ☐
- ☐ Needs to be different – does not need to be different ☐
- ☐ Easily defines problems – can not easily define problems ☐
- ☐ Thinks outside normal boundaries – has common, conventional way of thinking ☐

2. COMPLETION

- ☐ Engaged in task and motivated – distracted, not motivated ☐
- ☐ Involves completely in the task, becomes ignorant of the environment – is not involved in the task ☐
- ☐ Feels attachment toward the environment s/he works in – does not feel attachment, may be ignorant of the environment he works in ☐
- ☐ Diminishing interest in other people and what they may be doing – interested in other people and what they may be doing ☐
- ☐ Does not look around for inspiration – looks around for ideas ☐

- ☐ Works without interruption until finalization – may be distracted ☐

3. SELF-COURAGE

- ☐ Responds constructively to new situations - adapts, adjusts to existing situations ☐
- ☐ Can easily transfer life experiences to symbolic or pictorial representations – can not easily transfer life experiences to symbolic or pictorial representations ☐
- ☐ Needs to meet challenge – does not search for challenge ☐
- ☐ Attempts difficult tasks – does not attempt difficult tasks ☐
- ☐ Independent in choices – dependent in choices ☐
- ☐ Courageous in convictions – not courageous in convictions ☐
- ☐ Open to experience – reluctant about experience ☐

4. SENSITIVITY

- ☐ Reacts to experience more fully in thought and feeling - does not react to experience fully ☐
- ☐ Asks questions on seemingly insignificant parts of the experience - does not ask many questions ☐
- ☐ Shows increasing awareness while working – does not show increasing awareness ☐
- ☐ Needs flexibility in the environment – does not need flexibility in the environment ☐

5. NEGATIVITY

- ☐ Frequently punished, not approved by teachers – calm, liked by teachers ☐
- ☐ Indifferent to conventions and courtesies – cares about conventions and courtesies ☐
- ☐ Challenges rules and authority – obeys rules and authority ☐
- ☐ Rebellious, uncooperative – cooperative ☐
- ☐ Capricious, careless, disorderly – careful, orderly ☐
- ☐ Absentminded, forgetful – careful about duties ☐
- ☐ Argumentative, cynical, sarcastic – accepting, obeying ☐
- ☐ Sloppy with details – careful with details ☐
- ☐ Temperamental while dealing with a task – calm while dealing with a task ☐
- ☐ Overactive physically and mentally – calm physically and mentally ☐

6. IDENTIFICATION

- ☐ Identifies with task – does not identify with task ☐
- ☐ Directly and/ or indirectly includes her/himself in work – does not include her/himself in the project ☐

7. MOVEMENT

- ☐ At ease – nervous ☐
- ☐ Flexible – inflexible ☐
- ☐ Comfortable body gestures – rigid body gestures ☐
- ☐ Shows kinaesthetic experiences – does not show kinaesthetic experiences ☐
- ☐ Likes movement while dealing with task – does not like movement while dealing with task ☐

3. CREATIVE PRODUCT

CREATIVE – NON-CREATIVE

1. ORIGINALITY

- ☐ New – old ☐
- ☐ Unique – common ☐
- ☐ Original – unoriginal ☐
- ☐ Has come into being – has existed before ☐
- ☐ Novel – not novel ☐

2. IDENTIFICATION

- ☐ Reflective of the student's emotions – does not reflect student's emotions ☐
- ☐ Reflective of how ideas are carried to the future – does not reflect how ideas are carried to the future ☐

3. USEFULNESS

- ☐ Has a workable solution – does not have a workable solution ☐
- ☐ Appropriate – inappropriate ☐
- ☐ Useful – not useful ☐
- ☐ Valid discovery – not a valid discovery ☐
- ☐ Is an accomplishment – is not considered an accomplishment ☐

Appendix B.2. The Observation of the Environment

3. CREATIVE ENVIRONMENT (An Environment to Enhance Creativity)

CREATIVE – NON-CREATIVE

1. FLEXIBILITY

- ☐ A separate space in which the arts classes are carried out in – a space where arts classes and other classes are carried out in ☐
- ☐ A flexible space which allows for movement, grouping, and individual work during the act of creativity – a space that does not allow for movement ☐
- ☐ An arrangement of desks which does not exert pressure on the students – an arrangement that is strict and hierarchical ☐
- ☐ A space which allows for changes in time, as the curriculum changes, or as teachers and students want change – a space which is the same no matter what changes occur ☐
- ☐ A permissive environment – a restrictive environment ☐
- ☐ A space which is an environment without strictures – a space which is an environment with strictures ☐
- ☐ An environment in which the student feels free to express emotions, ask questions, explore, investigate, and feels safe – an environment in which the student does not feel free to express her/himself ☐
- ☐ A space which encourages social relationships – a space which discourages social relationships ☐
- ☐ An environment which is relatively informal, and that facilitates creativity more effectively than traditional and restrictive learning environments – an environment which is formal ☐
- ☐ A space that resembles a children's museum in which students are repeatedly and implicitly invited to interact with the environment – a space that the children are discouraged from interacting with the environment ☐

2. MAINTENANCE

- ☐ A space which the students like to come to and enjoy working in, made possible by the allowance of the students to participate in the designing activity – a space which the students do not enjoy coming to, and where they are not allowed to participate in the designing activity ☐
- ☐ A space where the equipment and materials are available to the students – a space where the equipment and materials are not available to the students ☐
- ☐ A space where certain responsibilities are given to the students in the maintenance of the art-room – a space where the students are not given any responsibilities in the maintenance of the art-room ☐
- ☐ An interesting space which attracts the attention of children – a boring space which does not attract the attention of the students ☐

- ☐ An environment which accomplishes the goal of maximizing congruence and promotes personal maturation – an environment which minimizes congruence and discourages personal maturation ☐
- ☐ A space where the student can involve her/himself by showing a personal reaction of her/his own – a space where the student can not involve her/himself by showing a personal reaction of her/his own ☐

3. DESIGN ELEMENTS

- ☐ A cue-rich environment – an environment deprived of cues ☐
- ☐ A space which uses natural and artificial light the best way possible – a space that cannot make use of the natural and artificial lighting ☐
- ☐ A space which has proper ventilation – a space that is not ventilated properly ☐
- ☐ A space which has colors which the users enjoy – a space which does not have colors which the users enjoy ☐
- ☐ A complete space which works in harmony when all elements of design are combined – a space which is not harmonious ☐

Appendix B.3. Assessments

5. ASSESSMENT (Discussed with the teacher)

1. CREATIVITY ASSESSMENT

poor average excellent

1. Flexibility 1__ 2__ 3__ 4__ 5__

-The student has stretched her/his imagination beyond conventional thought.

2. Fluency 1__ 2__ 3__ 4__ 5__

-The student has created several solutions to a problem

3. Novelty 1__ 2__ 3__ 4__ 5__

-The student has brought about and used new concepts in her/his project.

4. Originality 1__ 2__ 3__ 4__ 5__

-The student has created an art-work that is different from the other students.

5. Elaboration 1__ 2__ 3__ 4__ 5__

-The student has thought about and used several details in the project.

6. Ability to see deficiencies 1__ 2__ 3__ 4__ 5__

-The student has seen and completed in a creative way the parts of the project that have not been given.

7. Ability to redefine 1__ 2__ 3__ 4__ 5__

-The student has redefined the materials, elements of the project.

8. Open-ended solutions 1__ 2__ 3__ 4__ 5__

-The student has created a project that can be furthered in many different ways.

2. ASSESSMENT OF DESIGN ELEMENTS

1. Line (2D+3D) 1__ 2__ 3__ 4__ 5__

2. Shape and Form (2D+3D) 1__ 2__ 3__ 4__ 5__

3. Space (2D+3D) 1__ 2__ 3__ 4__ 5__

poor average excellent

- | | | | | | |
|--------------------|-----|-----|-----|-----|-----|
| 4. Texture (2D+3D) | 1__ | 2__ | 3__ | 4__ | 5__ |
| 5. Value (2D+3D) | 1__ | 2__ | 3__ | 4__ | 5__ |
| 6. Color (2D+3D) | 1__ | 2__ | 3__ | 4__ | 5__ |
| 7. Light (3D) | 1__ | 2__ | 3__ | 4__ | 5__ |

3. ASSESSMENT OF UNIFYING PRINCIPLES

- | | | | | | |
|---------------|-----|-----|-----|-----|-----|
| 1. Repetition | 1__ | 2__ | 3__ | 4__ | 5__ |
| 2. Variety | 1__ | 2__ | 3__ | 4__ | 5__ |
| 3. Rhythm | 1__ | 2__ | 3__ | 4__ | 5__ |
| 4. Balance | 1__ | 2__ | 3__ | 4__ | 5__ |
| 5. Emphasis | 1__ | 2__ | 3__ | 4__ | 5__ |

APPENDIX C



Appendix C.1.1. The T-Test Results of Person - "Originality"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on person-originality	3,3333	24	1,0072	,2056
	teacher on person-originality	3,4583	24	,7211	,1472

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on person-originality - teacher on person-originality	-,1250	,7409	,1512	-,4378	,1878	-,827

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on person-originality - teacher on person-originality	23	,417

Appendix C.1.2. The T-Test Results of Person - "Self-courage"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on person-self courage	3,7871	24	,4365	8,909E-02
	teacher on person-self courage	3,7417	24	,4916	,1003

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on person-self courage - teacher on person-self courage	4,542E-02	,2641	5,390E-02	-6,6E-02	,1569	,843

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on person-self courage - teacher on person-self courage	23	,408

Appendix C.1.3. The T-Test Results of Person - "Sensitivity"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on person-sensitivity	3,6667	24	,7020	,1433
	teacher on person-sensitivity	3,6042	24	,5513	,1125

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on person-sensitivity - teacher on person-sensitivity	6,250E-02	,3987	8,139E-02	-,1059	,2309	,768

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on person-sensitivity - teacher on person-sensitivity	23	,450

Appendix C.1.4. The T-Test Results of Person-"Completion"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on person-completion	3,2396	24	,7204	,1470
	teacher on person-completion	3,0100	24	,8386	,1712

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on person-completion - teacher on person-completion	,2296	,4349	8,877E-02	4,596E-02	,4132	2,586

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on person-completion - teacher on person-completion	23	,017

Appendix C.1.5. The T-Test Results of Person - "Completion" for EB

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on person-completion (EB)	3,6818	11	,6133	,1849
	teacher on person-completion (EB)	3,6045	11	,5937	,1790

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on person-completion (EB) - teacher on person-completion (EB)	7,727E-02	,2321	6,999E-02	-7,9E-02	,2332	1,104

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on person-completion (EB) - teacher on person-completion (EB)	10	,295

Appendix C.1.6. The T-Test Results of Person - "Completion" for BUPS

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on person-completion (BUPS)	2,8654	13	,5917	,1641
	teacher on person-completion (BUPS)	2,5069	13	,6753	,1873

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on person-completion (BUPS) - teacher on person-completion (BUPS)	,3585	,5275	,1463	3,967E-02	,6773	2,450

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on person-completion (BUPS) - teacher on person-completion (BUPS)	12	,031

Appendix C.1.7. The T-Test Results of Person - "Control"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on person-control	3,8750	24	,9470	,1933
	teacher on person-control	3,6250	24	1,0135	,2069

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on person-control - teacher on person-control	,2500	1,6485	,3365	-,4461	,9461	,743

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on person-control - teacher on person-control	23	,465

Appendix C.1.8. The T-Test Results of Person - "Negativity"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on person-negativity	4,2917	24	,6903	,1409
	teacher on person-negativity	4,7083	24	,5500	,1123

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on person-negativity - teacher on person-negativity	-,4167	,9286	,1896	-,8088	-2,5E-02	-2,198

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on person-negativity - teacher on person-negativity	23	,038

Appendix C.1.9. The T-Test Results of Person - "Negativity" for EB

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on person-negativity (EB)	4,2727	11	,6467	,1950
	teacher on person-negativity (EB)	4,6364	11	,5045	,1521

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on person-negativity (EB) - teacher on person-negativity (EB)	-,3636	,9244	,2787	-,9847	,2574	-1,305

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on person-negativity (EB) - teacher on person-negativity (EB)	10	,221

Appendix C.1.10. The T-Test Results of Person - "Negativity" for BUPS

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on person-negativity (BUPS)	4,3077	13	,7511	,2083
	teacher on person-negativity (BUPS)	4,7692	13	,5991	,1662

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on person-negativity (BUPS) - teacher on person-negativity (BUPS)	-,4615	,9674	,2683	-1,0461	,1231	-1,720

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on person-negativity (BUPS) - teacher on person-negativity (BUPS)	12	,111

Appendix C.2.1. The T-Test Results of Process - "Originality"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on process-originality	3,0833	24	,8805	,1797
	teacher on process-originality	2,8958	24	,9086	,1855

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on process-originality - teacher on process-originality	,1875	,6046	,1234	-6,8E-02	,4428	1,519

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on process-originality - teacher on process-originality	23	,142

Appendix C.2.2. The T-Test Results of Process - "Self-courage"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on process-selfcourage	3,2604	24	,5341	,1090
	teacher on process-selfcourage	3,3046	24	,5108	,1043

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on process-selfcourage - teacher on process-selfcourage	-4,4E-02	,4351	8,881E-02	-,2279	,1396	-,497

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on process-selfcourage - teacher on process-selfcourage	23	,624

Appendix C.2.3. The T-Test Results of Process - "Completion"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on process-completion	4,3333	24	,8681	,1772
	teacher on process-completion	3,7917	24	,8330	,1700

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on process-completion - teacher on process-completion	,5417	,8836	,1804	,1685	,9148	3,003

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on process-completion - teacher on process-completion	23	,006

Appendix C.2.4. The T-Test Results of Process - "Completion" for EB

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on process-completion (EB)	4,5455	11	,6876	,2073
	teacher on process-completion (EB)	4,0000	11	1,0000	,3015

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on process-completion (EB) - teacher on process-completion (EB)	,5455	1,0357	,3123	-,1504	1,2413	1,747

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on process-completion (EB) - teacher on process-completion (EB)	10	,111

Appendix C.2.5. The T-Test Results of Process - "Completion" for BUPS

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on process-completion (BUPS)	4,1538	13	,9871	,2738
	teacher on process-completion (BUPS)	3,6154	13	,6504	,1804

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on process-completion (BUPS) - teacher on process-completion (BUPS)	,5385	,7763	,2153	6,938E-02	1,0075	2,501

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on process-completion (BUPS) - teacher on process-completion (BUPS)	12	,028

Appendix C.2.6. The T-Test Results of Process - "Isolation"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on process-isolation	3,5417	24	1,3507	,2757
	teacher on process-isolation	3,4583	24	1,0206	,2083

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on process-isolation - teacher on process-isolation	8,333E-02	,9743	,1989	-,3281	,4947	,419

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on process-isolation - teacher on process-isolation	23	,679

Appendix C.3.1. The T-Test Results of Product - "Originality"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on product-originality	3,3750	24	,5758	,1175
	teacher on product-originality	3,3921	24	,5747	,1173

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on product-originality - teacher on product-originality	-1,7E-02	,3822	7,801E-02	-,1785	,1443	-,219

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on product-originality - teacher on product-originality	23	,829

Appendix C.3.2. The T-Test Results of Product - "Self-courage"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on product-self courage	3,6758	24	,7757	,1583
	teacher on product-self courage	3,5208	24	,6164	,1258

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on product-self courage - teacher on product-self courage	,1550	,6240	,1274	-,1085	,4185	1,217

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on product-self courage - teacher on product-self courage	23	,236

Appendix C.3.3. The T-Test Results of Product - "Elaboration"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on product-elaboration	3,8750	24	,5566	,1136
	teacher on product-elaboration	3,8542	24	,6672	,1362

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on product-elaboration - teacher on product-elaboration	2,083E-02	,4539	9,266E-02	-,1709	,2125	,225

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on product-elaboration - teacher on product-elaboration	23	,824

Appendix C.3.4. The T-Test Results of Product - "Flexibility"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on product-flexibility	3,7083	24	,5500	,1123
	teacher on product-flexibility	3,7500	24	,7940	,1621

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on product-flexibility - teacher on product-flexibility	-4,2E-02	,6241	,1274	-,3052	,2219	-,327

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on product-flexibility - teacher on product-flexibility	23	,747

Appendix C.3.5. The T-Test results of Product - "Fluency"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on product-fluency	3,7083	24	,5299	,1082
	teacher on product-fluency	3,6458	24	,3120	6,370E-02

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on product-fluency - teacher on product-fluency	6,250E-02	,4735	9,665E-02	-,1374	,2624	,647

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on product-fluency - teacher on product-fluency	23	,524

Appendix C.3.6. The T-Test Results of Product - "Identification"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on product-identification	3,7708	24	,6252	,1276
	teacher on product-identification	3,6667	24	,4584	9,357E-02

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on product-identification - teacher on product-identification	,1042	,4658	9,507E-02	-9,3E-02	,3008	1,096

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on product-identification - teacher on product-identification	23	,285

Appendix C.3.7. the T-Test Results of Product - "Usefulness"

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on product-useful	3,5833	24	,8681	,1772
	teacher on product-useful	3,2917	24	,6743	,1376

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on product-useful - teacher on product-useful	,2917	,8330	,1700	-6,0E-02	,6434	1,715

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on product-useful - teacher on product-useful	23	,100

Appendix C.4.1. The T-Test Results of Environment - "Flexibility" for EB

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-flexibility (EB)	4,1045	11	,1274	3,841E-02
	teacher on environment-flexibility (EB)	4,1500	11	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-flexibility (EB) - teacher on environment-flexibility (EB)	-4,5E-02	,1274	3,841E-02	-,1310	4,012E-02	-1,183

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-flexibility (EB) - teacher on environment-flexibility (EB)	10	,264

Appendix C.4.2. The T-Test Results of Environment - "Flexibility" for BUPS

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-flexibility	3,3331	13	,1485	4,119E-02
	teacher on environment-flexibility	3,4000	13	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-flexibility - teacher on environment-flexibility	-6,7E-02	,1485	4,119E-02	-,1567	2,282E-02	-1,625

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-flexibility - teacher on environment-flexibility	12	,130

Appendix C.4.3. The T-Test Results of Environment - "Maintenance" for EB

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-maintenance (EB)	4,0291	11	,2768	8,346E-02
	teacher on environment-maintenance (EB)	4,0000	11	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-maintenance (EB) - teacher on environment-maintenance (EB)	2,909E-02	,2768	8,346E-02	-,1569	,2151	,349

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-maintenance (EB) - teacher on environment-maintenance (EB)	10	,735

Appendix C.4.4. The T-Test Results of Environment - "Maintenance" for BUPS

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-maintenance (BUPS)	3,6123	13	,1413	3,919E-02
	teacher on environment-maintenance (BUPS)	3,5700	13	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-maintenance (BUPS) - teacher on environment-maintenance (BUPS)	4,231E-02	,1413	3,919E-02	-4,3E-02	,1277	1,079

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-maintenance (BUPS) - teacher on environment-maintenance (BUPS)	12	,302

Appendix C.4.5. The T-Test Results of Environment - "Design Elements" for EB

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-design elements (EB)	3,2909	11	,3727	,1124
	teacher on environment-design elements (EB)	3,3300	11	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-design elements (EB) - teacher on environment-design elements (EB)	-3,9E-02	,3727	,1124	-,2895	,2113	-,348

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-design elements (EB) - teacher on environment-design elements (EB)	10	,735

Appendix C.4.6. The T-Test Results of Environment - "Design Elements" for EB

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-design elements (BUPS)	3,2462	13	,3382	9,379E-02
	teacher on environment-design elements (BUPS)	3,3300	13	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-design elements (BUPS) - teacher on environment-design elements (BUPS)	-8,4E-02	,3382	9,379E-02	-,2882	,1205	-,894

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-design elements (BUPS) - teacher on environment-design elements (BUPS)	12	,389

Appendix C.4.7. The T-Test Results of Environment - "Identification" for EB

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-identification (EB)	3,5318	11	,5207	,1570
	teacher on environment-identification (EB)	3,6000	11	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-identification (EB) - teacher on environment-identification (EB)	-6,8E-02	,5207	,1570	-,4180	,2816	-,434

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-identification (EB) - teacher on environment-identification (EB)	10	,673

Appendix C.4.8. The T-Test Results of Environment - "Identification" for BUPS

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-identification (BUPS)	2,7908	13	,3737	,1036
	teacher on environment-identification (BUPS)	2,6600	13	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-identification (BUPS) - teacher on environment-identification (BUPS)	,1308	,3737	,1036	-9,5E-02	,3566	1,262

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-identification (BUPS) - teacher on environment-identification (BUPS)	12	,231

Appendix C.4.9. The T-Test Results of Environment - "Concentration" for EB

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-concentration (EB)	3,9091	11	1,1362	,3426
	teacher on environment-concentration (EB)	4,0000	11	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-concentration (EB) - teacher on environment-concentration (EB)	-9,1E-02	1,1362	,3426	-,8542	,6724	-,265

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-concentration (EB) - teacher on environment-concentration (EB)	10	,796

Appendix C.4.10. The T-Test Results of Environment - "Concentration" for BUPS

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-concentration (BUPS)	4,0769	13	,6405	,1776
	teacher on environment-concentration (BUPS)	4,0000	13	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-concentration (BUPS) - teacher on environment-concentration (BUPS)	7,692E-02	,6405	,1776	-,3101	,4640	,433

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-concentration (BUPS) - teacher on environment-concentration (BUPS)	12	,673

Appendix C.4.11. The T-Test Results of Environment - "Isolation" for EB

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-isolation (EB)	3,2727	11	1,4206	,4283
	teacher on environment-isolation (EB)	5,0000	11	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-isolation (EB) - teacher on environment-isolation (EB)	-1,7273	1,4206	,4283	-2,6817	-,7729	-4,033

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-isolation (EB) - teacher on environment-isolation (EB)	10	,002

Appendix C.4.12. The T-Test Results of Environment - "Isolation" for BUPS

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-isolation (BUPS)	2,9231	13	,4003	,1110
	teacher on environment-isolation (BUPS)	3,0000	13	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-isolation (BUPS) - teacher on environment-isolation (BUPS)	-7,7E-02	,4003	,1110	-,3188	,1650	-,693

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-isolation (BUPS) - teacher on environment-isolation (BUPS)	12	,502

Appendix C.4.13. The T-Test Results of Environment - "Contribution" for EB

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-contribution (EB)	3,2727	11	,6467	,1950
	teacher on environment-contribution (EB)	3,0000	11	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-contribution (EB) - teacher on environment-contribution (EB)	,2727	,6467	,1950	-,1617	,7072	1,399

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-contribution (EB) - teacher on environment-contribution (EB)	10	,192

Appendix C.4.14. The T-Test Results of Environment - "Contribution" for BUPS

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	student on environment-contribution (BUPS)	3,1538	13	,3755	,1042
	teacher on environment-contribution (BUPS)	3,0000	13	,0000	,0000

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	student on environment-contribution (BUPS) - teacher on environment-contribution (BUPS)	,1538	,3755	,1042	-7,3E-02	,3808	1,477

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	student on environment-contribution (BUPS) - teacher on environment-contribution (BUPS)	12	,165

Appendix C.5.1. The T-Test Results of Creativity-Assessment in EB

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	observer's creativity assessment (EB)	2,6318	11	,2700	8,142E-02
	teacher's creativity assessment (EB)	2,5236	11	,2634	7,941E-02

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	observer's creativity assessment (EB) - teacher's creativity assessment (EB)	,1082	,3354	,1011	-,1172	,3335	1,070

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	observer's creativity assessment (EB) - teacher's creativity assessment (EB)	10	,310

C.5.2. The T-Test results of Creativity-Assessment in BUPS

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	observer's creativity assessment (BUPS)	2,2969	13	,3273	9,077E-02
	teacher's creativity assessment (BUPS)	2,2562	13	,1961	5,438E-02

Paired Samples Test

		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	observer's creativity assessment (BUPS) - teacher's creativity assessment (BUPS)	4,077E-02	,1905	5,282E-02	-7,4E-02	,1559	,772

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	observer's creativity assessment (BUPS) - teacher's creativity assessment (BUPS)	12	,455