

DESIGNING IN MIND: CREATIVITY

Secil Satir¹, Elmira Sener²

Abstract — Creativity as an hypothetical aptness, can be found in each and every person. This inclination exposes a creative idea as a result of a multi dimensional thinking system, and the idea motivates the designer in order to be materialized.

The properties of creative thinking, the understanding of "four p" principles; "product", "process", "personality" and "press" in creativity, are the important creativity concepts that takes place in the continuity of this announcement.

Mentioning the experiments of creativity process in computer environment and their results, points out the differences between the creativity process in mind and in artificial mind. The presence of multi dimensional psychological factors effect the synthesis of thoughts in many aspects, whereas the images obtained from computers are insensitive and are varied in one dimension.

Therefore the fact that designing in mind is special to human and apart of human personality can not to denied.

Index Terms — Creativity, human mind, creativity process, creativity process in computer .

INTRODUCTION

Creativity is an impulse believed to be in every individual, an inner reaction that motivates the individual to think, act or to produce differently from the known.

Derived from the latin verb "creare", in german "kreativiat", the word creativity, is a perfection that brings out an independent idea, an action or a product as a result. However, this talent that can be improved with exact and hard working can be defined as talent for designing. Because to design means to form in mind, to organize and to sketch. It can also be explained as to prepare in mind, to perform, to organize ideas, to fantasize in mind etc. The meaning of the word "human thought" is a process of a multi dimensional thinking and materializing, giving a meaning to life.

CREATIVE THINKING

Creativity, just like design, includes a multi dimensional thinking process and the case of this process to be materialized. However, producing an original creative idea is not sufficient. It's required that this idea to be seen by the others. The materialisation of a creative idea can occur in an act; in the mimics, jests or words of a comedian; in a caricature, a picture, a statue or architecture; in a song, poem or an article; in a design object; in the solution of a daily

problem; in a scientific discovery; in a plan or system analysis; in the process of overcoming an economical difficulty; in creating solutions for a business or engineering problem etc. Briefly it can occur in finding positive solutions for all kinds of difficulties.

As seen, creative thinking covers almost the whole life. And in environments that no difficulty exists, it is significant to individuals who know life and whose creativity improved in order to feed their motivation to search, find and present the beauties of life.

To improve creativity one may not need to know how it forms in ideas, yet the knowledge of how an idea forms in mind may arise desire to feed the memory. For this reason, the knowledge of how and where an idea forms in the brain, how information is stored and how the communication is established in brain cells.

According to the studies of F. Vester, in the physiologic structure of thinking the stimuli that come to the brain are transferred between the cells to be evaluated, and 500 billion synapses work to transfer the stimulus between the brain cells [1]. With the help of these synapses, one can think, learn and remember systematically. The stimuli, also known as the information models that turn into substance as protein balls between the 15 billion brain cells, are continuously in communication with themselves and the new coming stimuli. These information models are always in a cycle of changing from substance to energy and energy to substance. The more the memory is fed, the denser the communication network would be, as long as there is not an obstructive reason.

These researches in creativity, lasting since 1950's, improve much with the studies of Guilford. Correl and Preiser define creative thinking extensively with the properties stated below [2] [3] ;

Properties of creative thinking:

- * fluency
- * flexibility
- * originality
- * problem sensitivity
- * re-structurability
- * materialization
- * activation with every detail

These properties show different concentration in every individual's idea. For some people fluency of the idea is in the first place, while for some others the most important property shifts to flexible thinking or to problem sensitivity.

¹ Secil Satir, Istanbul Technical University, Faculty of Architecture, Department of Industrial Design, Taskisla, 80191, Istanbul, Turkey, satirse@itu.edu.tr

² Elmira Sener, Istanbul Technical University, Faculty of Architecture, Department of Architecture, Taskisla, 80191, Istanbul, Turkey, senerel@itu.edu.tr

Dimensions of Creativity

According to American creativity researches, the "four p" principles defines the dimensions of creativity [3].

The "four p"s are;

- 1 - "product"
- 2 - "process"
- 3 - "person"
- 4 - "press"

Product

It is the materialization of an original idea formed by creative thinking into something that can be seen, touched, heard etc. Creative product leads to an exciting conclusion in scientific and art studies. It may also put forward solutions to the daily problems of private and business life. Above all, creative product is original and unique. Creative product is something that a person is not accustomed to; something surprising, logical, useful, exciting; an existing product that is changed, altered or entirely transformed; it brings out feelings such as joy, enthusiasm and relief.

Process

The formation of creativity in brain is not a mysterious process as many people believe, but a solution of a tiring work, effort and struggle.

Linneweh classified thinking into two groups as "visual thinking" and "intellectual thinking". It is seen that visual thinking can be continuously used in every situation. The transformation, alteration and re-organisation of the problem elements are in the coverage of visual thinking. It is an idea that has a strong perception capability. For that reason the formation of new connections and the increase of sensibility in visual thinking, develop creative talent and imagination, in other words the inner eye. It is an important fact for invention. On the other hand, intellectual thinking is based on logic, succeeding in understanding, comprehension, perception, presentation of what is learned and making use of them. Visual and intellectual thinking must not be separated, keeping in mind that creativity can be found in each and every person and it may build on an intermediate intelligence base. However, it is considered that intellectual thinking develops in intelligent people while visual thinking develops in creative people.

The stages of creativity process starts with the perception and analysis of problems by the inner reaction of the individual. It is followed by gathering information. The information stored in individual's memory, try or force to find ways of communication with the intervention of the synapses and they either enter an incubation phase or go in hypothesis formation.

As a result of these stages that can be named "black box" and "transparent box", creative idea comes out as "a sudden thought flare" or "an idea synthesis". For creativity process to be completed, the born idea should be examined,

scrutinized, readied to be materialized and finally materialized.

The problem that needs solution should be constructed first, in order to materialize the creativity process. No matter the sort of existing problem, the construction should be simplified. The simplification means the purifying of the problem from all complexities. The problem may be easier to understand by classifying, may be defined as one by separating from the others, or may be defined again by analyzing the roots keeping the saying "the solution of a problem lies down in its roots" in mind.

Person

It is known that creativity lies on at least an intermediate level of intelligence basis. For this reason creativity exposes the intellectual aspects of the individual. However, creativity is also concerned with the motivation field of the person, because the creative idea that forms in the subconscious and arises as a sudden thought, comes to life depending on the drives, in other words motivation.

Creative person overcomes complexities and conflicts, has self-confidence, resists obstacles and judges independently. He/she has characteristics such as curiosity and ability to provoke imagination. Creative person usually does not suppress his/her personal feelings and is determined on his/her way to the conclusion. He/she is sensitive to the unique and beautiful. Attaches importance to diversities. He/she is suspicious and notices the negative and absent parts of the existent with this suspicion. He/she is interested in mental studies. Differentiates ideas and objects. May have extreme excitement reactions. Knows himself/herself well.

Press

Press may either create or exterminate creativity. Creativity can not exist without a physical or social environment. Above all, attractive, exciting and independent press motivates creative thinking. On the other hand, lack of confidence, constrained behavior and senses, intolerance and various social and cultural obstacles barricade the creativity.

CREATIVITY PROCESSES IN COMPUTERS AND THEIR COMPARISON

In the century we live in, human brain is being studied in many aspects and its structural properties are being modeled in means of artificial intelligence. This improvement exposes the development of electronic machines that can compete with human intelligence. Despite the fact that the user spends less effort, it seems that machines with artificial intelligence will become more capable as their technology develops.

As known, designing in computer environment, presents efficient improvements in finding practical solutions, creating virtual reality, visualizing the design, designing

interfaces and creating artificial intelligence. This field, where the recent technologies are utilized, reaching a synthesis with words and numbers in theoretical dimension and with geometric shapes in visual dimension, may help the creativity studies. New patterns may be exposed by putting forward multiple possibilities from the geometric patterns which are recommended by the computer programmers and appreciated by the users.

“Harold Cohen designed a computer program which can generate drawings without the requirement of human interaction and produce an infinite number of variations within certain rules” [4]. However, such programs are limited with the thinking style of the individuals designing the computer program and they can not include all the users.

While it was easier to draw the planar and sharp contoured geometric structures in the beginning, with the developing technologies, designing with organic lines (alias wave front) and using the advantage of flexibility offers a wide range of design possibilities to the user. The designer uses this infinite opportunities as a tool for his creativity. Utilization of the visual abilities of the designer is important in developing computer programs, providing alternative production methods and presenting an easier use.

The programming which was “process oriented” before, has now turned into “object oriented” programming in realization of synthesis related to end user requests and analysis [4].

The Importance and the Difference of Designing in Mind

Searching alternative forms in design is useful with the use of computers in order to gain time and to produce multiple alternatives. Computer programs may present the form study in ways of step by step mutations. For example, designs of furniture back supports drawn in computer environment or alternative designs of some abstract forms improved by means of mutation, can vary only in their own limits in means of geometric forms. But in this variation, how can sensitive ideas, that effect the design and feed the human senses by taking place in permanent memory, be projected to the program itself ?

In contents of object oriented programs; tool, machine, objects, jewelry, environment, building etc. in all fields of design, except the assisting role of computers in speeding up the process, the first and sudden creative idea of the place or object design is particular to the individual. With the use of advanced computer technologies, exposing the idea using a touch pad and realization of creativity process by transferring organic forms to an electronic interface, is useful in presenting the idea as fast as possible.

On the other hand, the effect of the cultural structure which does not exist in computer programs, the psychological status of the individual and images on creative senses can not be denied. The most important property of creative intelligence, also defined as emotional intelligence,

and its main difference from designing in mind, is the reflection of this emotionality on creative thinking.

CONCLUSION

The age we live in is the information age. Science and technology aim a better, healthier, longer and happier life for us. A happier life is equivalent to the usage of a wider range of creativity. If the designer can design a product that suits his sensibility, using the available programs directly or with the use a few key strokes and still continues to enjoy drawing with his hand, then science and technology would succeed in their task.

While the new disciplines introduced by computers such as “virtual reality”, “interface or interaction design”, “design for visualization” and “artificial intelligence” replace the design disciplines, they also should remain within certain limits leaving the design process to the designers themselves.

If the computers aim to replace the human brain, then the individuals would have to record all their daily incidents, perceptions, senses both in verbal and figurative and schematic ways to their computers. Regarding the informations and perceptions that the human brain finds necessary to forget, solving the problem would be more complex.

Computer technologies can make the work easier, exalting the creative personalities, instead of depriving the person of his joy to design and create.

Given all these information and ideas, creativity can be defined as a source of happiness that gives meaning to life and confidence to deal with the obstacles in every stage of our lives.

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