FORMS AND PATTERNS OF THE CREATION PROCESS AND THE CREATIVE INDIVIDUALITY

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INTRODUCTION

Defining the concept of *creativity* and presenting a research background for creativity led us to making its general characteristics. It is well known that creativity is manifested in various forms of human activity. For this reason, creativity has always had a specific character. The present paper aims at approaching creativity under differential aspects: emphasizing the specific **forms** of creativity and placing technical and technological creation within these forms, as well as identifying the stages, the types and the structure characteristic of technical and technological creation.

1. TYPES AND FORMS OF CREATIVITY

Some authors believe **that there exist as many forms of creativity as there are distinct occupations, as well as many aspects as the human nature has**. It is easy to guess how the mechanism of structuring the creativity forms works as every creative potential needs to take some specific form to become concrete. Following this idea we should establish the **forms** and the **types of creativity**. A consequent analysis of referential literature which treats forms of creativity has been done.

Most researchers introduce certain criteria of classification in order to identify forms of creativity [1]. We adhere to the criteria suggested by A. Carnauhov and D. Patraşcu and will adopt the following **criteria for creativity form classification**: 1) the subject potential and abilities; 2) the creating aspect; 3) the domain in which creativity manifests; 4) the creative process approach; 5) the performance; 6) to which social category the subject belongs; 7) the biological factor – the age of the subject.

Treating every criteria of classification separately we can identify different forms of creativity. **According to criteria**: **the subject potential and abilities** we may distinguish: *mental creativity, practical / praxiological creativity*; **the creating aspect** – *individual creativity, group creativity*; the **domain in which creativity manifests** – *scientific creativity, technical creativity (technological creativity, technico-technological creativity), artistic creativity*; **the creative process approach** – *spontaneous (inspired) creativity, stimulated (organized) creativity*; the **performance** – *scientific, technical, technological, economic, literary, socio-political, sports, creative - performing, pedagogical (educational), managerial, etc.*; **to which social category the subject belongs** – *pupil creativity, student creativity, teacher creativity, engineer creativity, etc.*; **the biological factor** – *adult creativity, teenager creativity, pre-adolescent creativity, pre-school creativity, ante preschool creativity*.

Identifying these **forms of creativity** we should emphasize that new forms of creativity may be found within the existing forms. For example: 1)within scientific creativity there may be identified creativity in mathematics, physics, chemistry, etc.; 2) in technical creativity – project creativity, constructive, modeling creativity, technological creativity; 3) in artistic creativity – poetic creativity, musical, plastic art, interpersonal creativity, etc.

Differentiation of types of creativity has been made more frequently within investigating scientific, technical and artistic creativity. Simplifying the problem and adhering to the creativity typology proposed by D.W.Mackinnon and Al. Roşca we distinguish three types of creativity. *The pertinence of the creative product and the relationship between the rate of interiorization and of exteriorization within the creative process* serve as criteria of such classification.

According to *the first type*, the creation product is an expression of the creator's interior world (needs, perceptions, motives, evaluations). Within *the second type* of creativity the created product is not in relationship with the creator as a person; the creator acts largely as mediator between needs and goals (the works of the scientific researcher in physics, industry, education, etc.). *The third type* of creativity constitutes a blending of the first and second type of creativity (representation artists, architects, designers, etc.).

These three types of creativity are accepted by me in technical creation because in the process of technical creation certain interior feelings of the individual are being manifested as well as the mediation of the individual with the outer world.

2. DEVELOPING TECHNICAL, TECHNOLOGICAL AND PEDAGOGICAL CREATIVITY

Further on, we shall focus our attention on technical, technological and pedagogical creativity. Here we ascertain that specialty literature treats, almost exclusively, individual technical creativity, whereas there is less literature dedicated to the research which demonstrates collective technical creativity, technological and pedagogical creativity.

At present, researchers treat technical creativity as both science and arts, identified within the term *inventica*. V. Belous considers **inventica** as science to the extent to which its creative product is related to logicality, and as arts to the extent to which this process remains in the sphere of co-participation between the conscious and the subconscious, between the ability of sequencing convergent and divergent thought, between the algorithmic and the heuristic, between deduction and induction, between analysis and synthesis, between logical-algorithmically techniques and methods and the intuitive ones [2; 3; 4].

The explanation of the process of creation is based on psychoanalytical concepts pointed out by S. Freud, A. Adler and K.G. Jung. Thus, in order to explain the process of creation to students we resort to the fundamental principles issued by S. Freud:

1. *Psychic Determinism*: there exist in psychological acts relations of causality, interdependence, continuity; random psychological acts do not exist

2. *The Unconscious*: it has major importance for the mental activity. It is governed by certain laws; between the conscious and the unconscious there is a barrier which is called censure, acting as a filter.

3. *Motivation*: human behavior is always driven by motivation: any act, expression, action has a logical significance, and is grounded on hidden motivation on the unconscious level.

4. *Evolution of the individuality*: the character is born out of *pregenital pulses*, and develops under social pressure, capable of changing its object.

K.G. Jung's research in determining the individuality structure has acquired special significance in explaining the developing of students' creative abilities within the process of technological creativity.

In K.G. Jung's opinion the individuality structure includes: the psyche; the consciousness of the Self; the personal unconsciousness which includes various complexes; interactions between individuality structures; individuality dynamics and development; psychological types; the place of symbols and dreams in the individuality structure.

The consciousness of the Self, the personal and the collective unconsciousness manifest in an especial way within the creative process. *The consciousness* is that part of the brain which can be known by the individual through its four basic mental functions: thinking, affections, sensitiveness, and intuition. The prevailing of one of the functions will stamp the individual character with some specific qualities: thoughtfulness, sentimentality, sensitiveness, or intuition. *The personal unconsciousness* is that part of the individual which stores from one's birth all personal and conflict experiences, moral problems, the unsettled ones, the ones which seem to have little importance, everything that is sensed, thought, felt, and forgotten. The irrational includes the psychological functions of the major importance for the creative process, such as *intuition, feeling, and occurrence*.

3. SAMPLES OF THE CREATION PROCESS AND OF THE CREATIVE INDIVIDUALITY

In this article we resorted to two types of patterns; **patterns of the creation process** and **patterns of the creative individuality**

Patterns of the creation process. To stimulate and develop students' creative abilities within the process of technological training the research has resorted to the ideas incorporated within a series of patterns of the creation process. Further on we will list specifics of the patterns: *the constructivist stage of the intelligence development, **the three-square** heuristic of the technical creation, the sequencing of the creation process, creativity as a product, hierarchic of the creative plans, functional of creativity, tetrahedron of the creativity, geometric of the volume (intensity) of creativity;* preponderantly under the aspect of our research.

Let us point out the specifics of the **constructivist stage of the intelligence development** pattern. J. Piaget considers that

creative imagination is gradually integrated into intelligence in pace with the children's growing. According to the author [4], during the development process the creative imagination rather grows than diminishes; creativity and intelligence synergistically support one another in order to generate a more productive mental activity. *The ability to evaluate a situation* from multiple perspectives is essential in the creative process. This ability is formed in early childhood through a diversity of activities related to the sensorial-motor exploration of objects. J. Piaget considered similarly significant the docile nature of the creative process: it alters alongside with the child's progress within development stages.

The three-square heuristic pattern of the technical creation. Its author, I. Moraru [5; 6] proposes to call the functional structures which share partnership in realizing creativity, inventions, and discoveries "heurism" (from the Greek heuriskein – to learn, to discover, etc.). Thus, heuristic structure means a grouping of functional parts, related to each other, which have a distinct function in the production of the new. To say it otherwise, ***heurisms*** *are called the structures which work together at realizing creativity and participate in inventions and discoveries.*

All conjugated creative structures will form the psyche (person) as an integral creative system. The part as well as the integral should be conceived multi functionally. A part may work in succession and simultaneously in more creative structures, which, in their turn, work in succession and simultaneously with each other, within the integral creative system – the person. The fundamental psychic processes are considered as functional parts which are structured to form heurism, the latter with proper functions and well defined within the creative intention. The following 6 heurism are defined in accordance with their basic functions:

(1) *The heurism of accumulation and comprehension of information*, achieved by memory, convergent thought, language, interests, etc..;

(2) *The combinatory-associative heurism*, achieved by divergent thought, imagination, intuition, fantasy, memory, the conscious and the unconscious, etc.;

(3) *The stimulating-energetic heurism*, which integrates a synthesis of the passion, the feelings, the motivation, the interest, the will, the courage, the needs, the engagement, the environment, and the pleasure of inventing and making discoveries, etc.;

(4) *The critical, evaluative heurism*, achieved by analytical thinking, logic-deductive, by the critical function of the intelligence and the conscious, etc.;

(5) *The inductive-perceptive heurism and pertaining to objects images*, in which ideative, perceptive and motor components participate;

(6) *The action–practical (technological) heurism* [1, p.36].

The heurism pattern (Figure 1) expresses the configuration of the mentioned structures within a square analogical to the logical square.

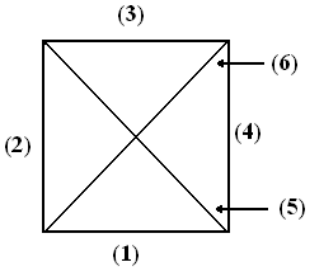

Figure 1. The heurism pattern (after I. Moraru)

The author points out that heurism involved in producing new original ideas are placed on the four sides of the square, whereas the heurism which participate in transforming ideas into things and masterpieces (scientific, technical, artistic, pedagogical, etc.) are placed on the two diagonal lines.

Apparently included within the limits of functional and processional psychological coordinates, the developed form of the pattern (Fig. 2.) the integration of the psychological level into the anthropologic, based on the environment-nature, organism – human being, brain – psyche, creativity – creation, and the ontological centered on concepts of existence, becoming, creation and duality.

The synthesis of the heurism pattern and the pattern of duality series and progressive transformations (Figure 2), in the hypothesis of its

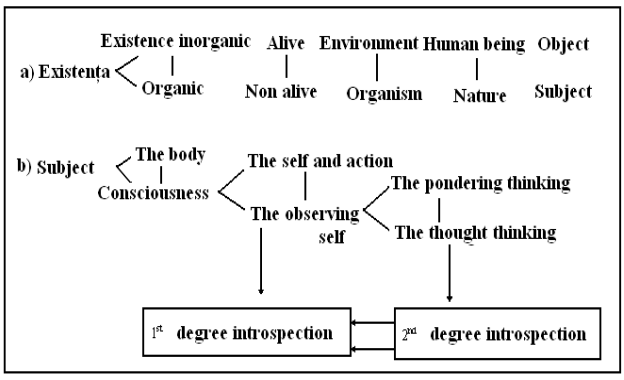

Figure 2. The pattern of duality series and progressive transformations of the existence (after I. Moraru).

applicability, including consciousness as an objective part of existence, contours a heuristic pattern, such as indicated in Figure 2. This pattern insures the cognition and the reconstruction of the creation process, the psychosocial effort of tearing out whatever is called novelty of the nonexistent and its integration into the existent.

Besides the explanatory value which this pattern has in knowing the structure of the creative psycho-behavioral module, the author demonstrates its applicative value in heurism graph. It consists in a succession of creative sequences, which integrates into a creative process [7].

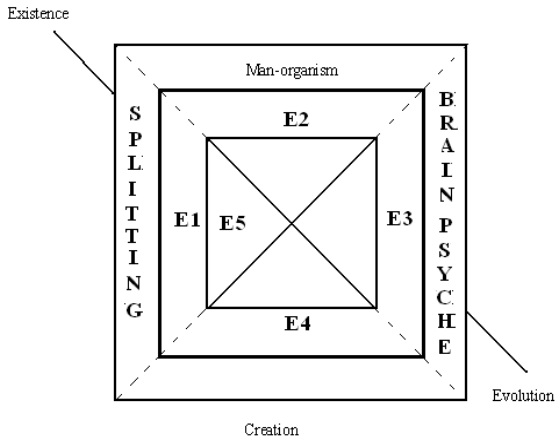

Figure 3. The heuristic pattern (after I. Moraru).

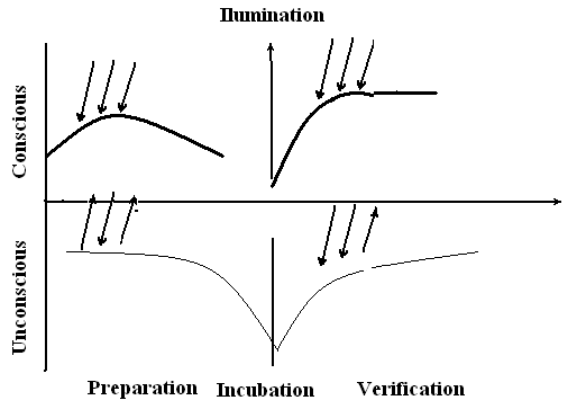

Figure 4. The sequencing pattern of the creative process (after V. Dulgheru, L. Cantemir, M. Carcea)

It insures a graphic arrangement of sequences of a discovery or invention, in their succession, based on biographical, autobiographical or documentary information (analysis of activity products, evidence, notes, etc.), facilitates comparative analysis, securing rigors and efficiency. We use the method in analyzing the history of a discovery as an exercising activity.

I. Moraru's pattern is disputable due to interference of certain plans and individuality variables; yet, it is advantageous in its attempt to integrate the "*couples*" which intervene in the complex process of creation. This pattern reflects only the contribution of the creative subject in achieving the technical creation (Figure 3).

The sequencing pattern of the creative process. The first phasing of the creative process belongs to J.Wallas [8] and differentiates four phases: preparation, incubation, illumination/inspiration, evaluation. *Preparation* is a phase which preponderantly takes place at the level of conscious structures and lies in successive definitions and redefinitions of the problem, as well as in organized and consequent data collecting which may lead to finding a solution.

Incubation, the most controversial phase of creation, takes place preponderantly at the level of the unconscious structures, where spontaneous, unconscious processing of problem data take place, as well as of information which was collected consciously in order to solve it in terms of a certain criteria.

Illumination represents the moment of growing aware of a relation, more or less expected, between the problem data and a certain informational structure, which results from conscious and unconscious data processing, simultaneous and consecutive.

Evaluation consists in conscious examining of the ways of equilibrating the informational corpus *problem* with the informational corpus *solution* in one or more concrete situations.

The intuitive pattern of the creative process phases is graphically presented in Figure 4.

On the horizontal line is represented the time variable from the moment of realizing the problem situation – to the identification of the solution – ***t1***; duration of the integral process of creation will be ***dt***, with variable values from the case, from the order of seconds to that of years. In most situations, the creation process has not a unique direction; the illumination moment may offer just an alternative to the solution, which in its evaluation phase may lead to new preparations and incubations. On the vertical line are represented the active psychic levels in different phases. The continuous arrows suggest in this pattern the informational input, and the interrupted ones – the psychological energy input which supports the process.

Alongside with the creativity patterns based on the process, specialty literature proposes patterns of creativity as a product.

The pattern of creativity as a product. At a high level of abstraction, the creation product is expressed by performance under the aspect of the main characteristics of creation, and namely its social novelty and value. Among the most accepted definitions of creativity stands the one developed by Ghiselin, which states that a creative performance is a *first modeling of a universe of meanings, expressive of the way in which the individual understands the world and himself* [9].

According to the author, the appreciation criterion of the creative product is the measurement which he succeeds to use to restructure the whole universe of meanings.

The hierarchy pattern of creative plans. Analysis of definitions and approaching creativity vertically claim examining the idea that *all persons are potential creators to some extent* [10] and the idea that there exist several levels of structuring creativity. These ideas allowed Irving A. Taylor to develop [10], a pattern which may be considered operational enough to evaluate creative products of different levels of complexity. I. A. Taylor describes five different creativity plans, in hierarchal succession:

- *expressive creativity plan* characterizes the universe of childhood, where behavior is what really matters, not the ability of the obtained product. This plan finds expression in specific products: drawings, games, fantasy stories, spontaneous and free improvisations;
- *productive creativity plan*, which relates to acquiring some incentives for certain domains (of communication and expression);
- *inventive creativity plan*, which means the capacity to achieve new links among already known elements. This plan is attained in inventions and discoveries based on flexibility and receptivity towards the environment;
- *innovative creativity plan*, characteristic of few people, lies in finding some new solutions with a theoretical and practical resonance;
- *emergency creativity plan*, the highest level of creativity, specific of genii who, through their contributions, have revolutionized an entire domain of science, techniques or arts [10].

The functional pattern of creativity. Implementation of instructional programs of creativity, based on classical patterns of creativity (the factorial pattern and the processional one) lead to stating that these generate significantly different effects, namely, training abilities leads to raising potential creativity, without externalizing an increase of performance under the aspect of the manifested creativity, and the process training favors the appearance of some concrete products of creation – projects, patent projects, didactic projects developed by students – not attested by a significant increase of potential creativity.

The presented pattern is qualified as functional, on the one hand, as it offers priority to the role it has in the structure of the practical didactic activities of developing professional creativity (in the technical, technological and pedagogical domains), on the other hand, due to the meaning attributed to creativity. Let us stipulate that we approach the problem of creativity from a systemic perspective which permits acceptance of the following premises:

- creativity represents the specific difference which defines *the human psychic system* reported to those infrahuman, constructive (creative) adjustment being established in terms of its maximum generality (the aim of the system);
- creativity is achieved through interaction of cognitive and affective processes at the specific intellectual and human level, respectively, of feelings and passion which we consider conscious, integrated emotions, in time with profound psychic structures;
- creativity improves in conscious creative activity due to the capacity of optional self-regulation of the human psychic system through feedback.

Within the functional pattern, creativity is due to the interaction of the psychological processes, to the evolution of the cognitive and affective process component. At this point creativity is considered a permanent phenomenon, evolutional and descriptive, oriented towards finalizing the creation product. The phases developing between the two restructures of the incipient structure can be described using the classical phases of creativity: looking for information (preparation) → assimilation of restriction (incubation) → integrating restriction those anterior (illumination) → selecting and reorganizing the pertinent informational zone (verification of solution).

The functional pattern permits to formulate the following conditions to finalize the creative activity into a creation product:

- *the cognitive restrictions should be deliberately interpreted as an increase in cognition* in both confirming the formulated hypothesis, indicating the opportunity of advancing in the selected direction, and in infirming the hypothesis, in closing research direction, in which investments have been made;
- *the feeling which comes along with the positive experience of creation should be understood* in order to accelerate the transformation

of discreet, situational emotions into continuous emotions and passions;

- *equivalent and interdependent treatment of cognitive and affective components*, in their specific humane manifestation by imagination-thought and feeling-passion forms. The affective component gives the energy necessary for new acquisition of knowledge, and the cognitive one orients the person towards pertinent informational zones, both dealing with individualized data processing.

The functional pattern integrates aspects of creativity product and process and suggests the subjective conditions of the interaction person-situation favorable for the creative act.

The tetrahedron pattern of creativity – developed by V.Feier – includes the *creating subject, the creative product, the creative activity, the creative environment*. In the geometrical figure the V. Feier pattern represents a tetrahedron, in which the four surfaces confining the body (the creative system) are constituted of: *the creative product* (ΔABC); *the creative subject* (ΔABD); *the creative activity* (ΔACD); *the creative environment* (ΔBCD) - (Figure 5)

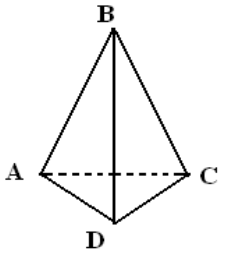

Figure 5. The creativity tetrahedron (V. Feier).

The creativity tetrahedron possesses properties, which prompted recommendations that serve as guidelines in the practice of developing students' creative abilities in the process of technological training:

* All four surfaces are necessary to make the tetrahedron work, that is, develop creativity, and each of them should have its area smaller than the sum of the other three;
* Each triangle interrelates with the other three, forming the corresponding edges;
* Only one point of view is not enough "to see" the whole body;
* To increase the quadrate of a triangle it is necessary to alter the configuration of the other triangles.

In order to disclose the strategy and the tactics of students' creative abilities in the process of technological training, we will analyze the geometrical pattern of the creativity volume (intensity) - developed by V. Enătescu [1, p.71-76] from a psycho informational perspective, presented in the creativity pyramid (Figure 6).

From the creativity pyramid pattern we may see that the new objectively-introduced factors are related to: 1) technico-organizational conditions: the technical level; the level attributed to the research; 2) the researcher individuality: the individuality indices; the age; the scientific position.

All these factors are necessary, but they do not reflect creativity integrally. They only serve as

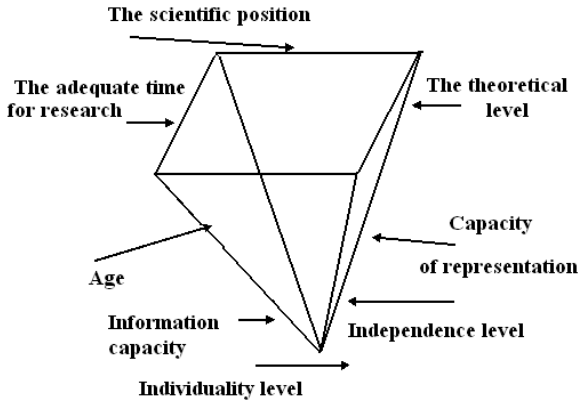

Figure 6. The creativity pyramid (V. Enătescu).

an impetus for understanding the dialectics of the creation process, on which the process of formation students' creative abilities in the process of technological training is organized.

Different from the patterns of the creative process, pointed out previously, the specialty literature describes patterns of the creative individuality, which we are going to refer to further on.

Patterns of the creative individuality. This article aimed at our taking decisions regarding the intelligence pattern, the factorial pattern and the descriptive pattern of the creative individuality.

The intelligence pattern – a fundamental ability of the creator. Responding to the aims of the article, it is necessary to identify the peculiarities of the creative people, alongside with the peculiarities of teachers engineers. Starting from G. Sperman's idea that two categories of factors can be distinguished within the human abilities context, a general factor – which participates in performing all activities, and numerous special factors – which correspond only to concrete conditions of one form of activity (engineering, pedagogy, artistic, managerial, etc.), it is considered that creative people possess intelligence and specific thinking. Yet, a man's thinking depends on the activity he was practicing. It has been established that the artist's thinking character is different from that of a technocrat, based on the predominance of this or that form of thinking (Figure 7, a). The artists' dominant form of thinking carries a mythological or magic character, they are marked by powerful

feelings of guilt, are independent of their parents and introverts; whereas the technocrats are dominated by scientific thinking. In case of teachers engineers, both forms of thinking are characteristic with them (Figure 7, b), because in their activity both scientific thinking and mythological and magical thinking (from the point of view of pedagogy as arts) manifest, they are also endowed with alchemic and religious-ethic thinking.

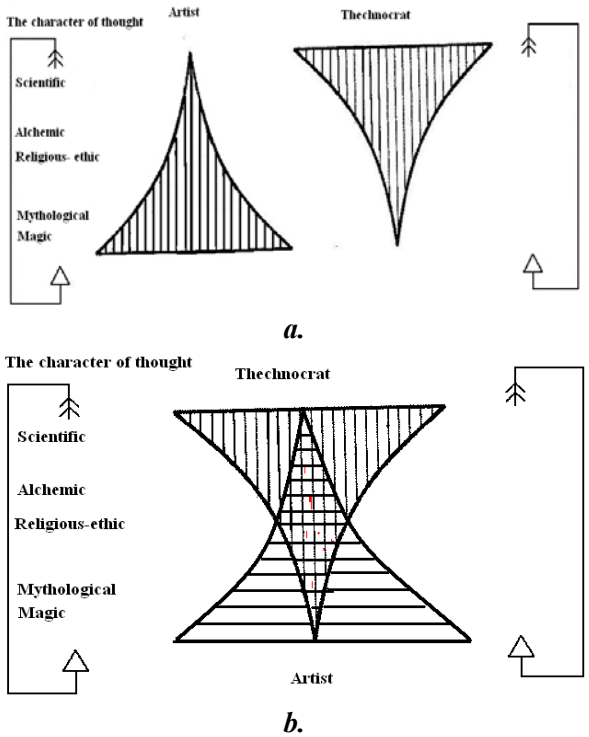

Figure 7. The nature of thought of artists, technocrats and engineers teachers.

The stated ascertainment allow us to argue the fundamental ability of the human creator – the intelligence (a term derived from Latin, the Romanian equivalent of *cleverness*), with reference to engineers, teachers of technological education

Intelligence is a complex phenomenon and therefore its defining is difficult. Definitions made so far have not yet met a unanimous acceptance. However, ***intelligence*** can be defined as *a general cognitive function*, *based on abstraction, pattern construction and problem solving*. In our research ***intelligence*** is treated as the *general ability to solve problems optimally, that is the ability to meet all obligations that require some adjustment capability, and a spirit of observation and logical deduction*, etc.

Basic functions of the intelligence are: *abstract thinking, mathematical skills, verbal expression, ability to diagnose and resolve, memory and creativity*. Thurstone established the following ***factors of intelligence***: *reasoning (deductive and inductive), memorizing, capacity, perceptual quickness, spatial operation, understanding of words and verbal fluency*. Intelligence can be assessed. Empirically it can be evaluated by: learning efficiency, ease and depth of understanding, difficulty and novelty of the issues which the subject is able to solve. The best-known parameter for determining the level of creativity is intelligence quotient IQ (measured in points), which differs from person to person. Research shows that the vast majority of people (except those who have a pronounced degree of debility) possess creative skills (Figure 7).

Statistical surveys have shown that IQ – ranges in average between the extremes of 60 and 140 with the majority placed between 90 and 110 and that its value increases until the age of 25-30 years. Statistically, the distribution of IQ for a given population has values that are represented by Gauss's curve (Figure 8).

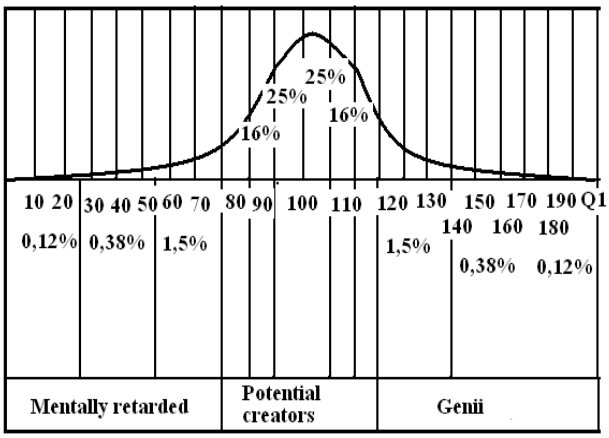

Figure 8. IQ curve (or Gauss's curve) at various categories of people.

One of the great issues of intelligence is related to the factors that determine it fundamentally. ***Is intelligence innate, congenital or acquired?***

Milson Ehile established that human ***intelligence*** is a quantitative aspect, which has ***a double determination*** - *genetic* and *environmental*. According to this theory, the man is born with a certain *potential* intellectual genotype, whose realization depends on the environment, favorable or unfavorable. After H.J. Eysenck, intelligence is genetically determined in the ratio of 75-80%, the environment having a 20-25% of influence.

It is to be accounted that measured intelligence increased up to 15 points from one generation to another. It can not be explained by the increase of the „*informational*" bombing upon

subjects, or it can not be explained essentially from this point of view.

Age has also an influence on intelligence, research and innovation. There are views and the assumption that scientists have produced their best works at the age between 30 and 34 years. H. Abt concluded that the most important discoveries were made at the age between 30 and 70 years, although the maximum number of major work was done at the age of 45-50 years.

The factorial pattern of creative individuality. A complex model of the creative individuality has been proposed by A. Munteanu [11]. It has teaching and psycho diagnosis destination in developing creativity. According to the author, creativity training involves multiple cooperation among the three categories of factors: psychological, biological and socio pedagogical.

The three-dimensional pattern of the intellect. Researches of J.P. Guilford highlight and systematize the intellectual skills involved in creative activity.

Creativity *is seen as a set of specific intellectual skills*, integrated in a unitary intellectual structure defined on three dimensions: *individuality*, *content* processed by intellectual processes and the *products* of such processing.

The specific continuity that features it is a divergent thinking, seen by the diversity of orientation of sequences of operations, seeking different solutions to problems. The phrase is used by J.P. Guilford by analogy with the concept of imagination. Variants of processing knowledge progress on the direct-indirect cognition dimension, in the following sequence: perceptual knowledge → storing → convergent thinking→ divergent thinking → evaluation.

Attributing meaning to the order in which the processes are presented in the patterns, we can deduce that the divergence processes previously collected and fixed in memory content, being oriented towards providing the necessary data for a convergent processing, and choosing the one and correct answer from among all possible alternatives. The contents vary according to specific-abstract criteria in the following sequence: figural → semantic → symbolic→ behavioral. These contents are *representative* for specialized domains of activity: the figural – the technical-applicative and the fine arts domain; the symbolic – sciences, the specialty literature and technical concepts widely use the semantic content, and the behavioral – in the social sciences and the humanities, including those of education. Please note that by *representative* we do not understand exclusiveness. The size of products is divided according to the particular-general criteria: after the first two relational factors, after the quantitative criteria (one and) clear quantitative structural differences appear, which express the nature of the relationship between the units and classes or among several classes, generating systems, functional units convertible into new structures, with implications for *neighboring* systems (any system that can achieve the new system, regardless of the criteria).

In this pattern there have been identified six specific skills of creativity, each one being able to *divergent production*, which can be translated into partial or integral products.

From the point of view of pedagogy, we advert to the risk of giving priority to the pattern, namely the one which considers any problem solving a creative exercise. The perseverance with which J.P. Guilford returns to the idea that any act of creation is actually a problem solving, indicating reciprocal risk accuracy (that any problem solving is a creative act) is false.

Similar to J.P. Guilford, V. Lowenfeld [13] came to similar features, who, besides restructuring skills, analysis, synthesis and consistency of organization, defines ***four factors*** that seem to be ***related to*** the ***functional features of complex mental processes*** such as: sensitivity to problems that would be based on non-sensory sensitivity, *responsive availability*, *mobility* and adaptive to different situations that feature and *originality* that defines by contrast with "*conformity*".

Along with the researches of J.P. Guilford and V. Lowenfeld, we highlight the following specific skills pointed out by A.N. Luk in the context of the psychology of creativity: a) alertness in researching issues, 2) the ability to compress the operations of thought, 3) ability to transfer the experience, 4) the integrity of perception, 5) approaching terminology; 6) memory training, 7) flexibility of thought, 8) the ability to think; 9) ability to assess, 10) chaining and unchaining capability, 11) ease of generating ideas, prediction skills, 12) speech flow, 13) processing capacity, 14) capacity and creative potential [14].

Description of factors and intellectual skills involved in creativity, emphasizes the cognitive component of the creative individuality, striking a balance between the image of the bizarre genius, weak and vulnerable, and the strong one, pragmatic, victorious, not as a mix, but as multiple and alternative patterns of diversification, and what is essential, with equal chances of success.

CONCLUSIONS

Concerns about the conceptualization of the creativity phenomenon are dominated by identifying the features of the creation process and of the creative individuality.

To stimulate and develop the students' creative skills in the process of technological training the ideas embedded in the patterns of the creation process are effective.

Experts say that ***creativity*** is *seen as a set of specific intellectual skills of the person*. Creativity includes the following skills: analysis, synthesis, consistent organization, fluidity, flexibility, redefinition, development, originality, sensitivity to problems, receptive availability, mobility etc. These skills can be initiated and developed in teaching, resorting to problem solving and applying well-structured instructional strategies.

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