ON THE CREATIVE POTENTIAL OF PUPILS AND UNDERGRADUATES

ASPECTE PRIVIND POTENȚIALUL CREATOR AL ELEVILOR ŞI STUDENȚILOR

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Abstract: *In this paper we analyse a few aspects concerning the creative potential of pupils and undergraduates through the prism of concrete research consisting of a test made up of five trials (four of verbal creativity and one of figural creativity). The answers to these quizzes allowed us to assess three intellectual factors of the creative potential, i.e. fluidity, flexibility, and originality (individually, group, item, and trial). The conclusions led us to the general idea of the need for a creative scientific climate in educational environments (family, school, work place, etc.).*

Rezumat: *Lucrarea analizează câteva aspecte ale potențialului creativ al elevilor şi studenților prin prisma unei cercetări concrete, care a cuprins un test format din cinci probe (patru de creativitate verbală şi unul de creativitate figurală). Prin răspunsurile la aceste probe am evaluat trei factori intelectuali ai potențialului creativ şi anume: fluiditatea, flexibilitatea şi originalitatea (individual, de grup, pe item şi pe probă). Concluziile desprinse ne-au condus la ideea generală a necesității creării unui climat ştiințific creativ în mediile educaționale (familie, şcoală, mediul de muncă etc.)*

Key words**:** *the creative potential, verbal creativity, figural creativity, fluidity, flexibility, originality*
Cuvinte cheie: *potențial creativ, creativitate verbală, creativitate figurală, fluiditate, flexibilitate, originalitate*

INTRODUCTION

Creativity is not an autonomous psychic skill, but the result of optimal management of different personality factors. From this point of view, it is not a supplementary dimension of personality, but the result of cooperation of varied psychological processes under variable conditions. As a result of the entire personality, creativity only occurs under specific forms. It is a complex of psychic features and skills which, under favourable conditions, generates new and valuable products for society. Achieving creative performance implies a minimum of intelligence, different from one domain to another (MICLEA & RADU, 1991), but not below the average.

At first, creativity is mistaken for intelligence: as a consequence, diagnose instruments of creativity are intelligence tests. Because the vast psychological studies between 1923 and 1926, that did not result in correlations between the remarkable intelligence coefficient (IQ) initially obtained by the subjects and their later creativity, as well as because of insignificant correlations between the IQ and creativity resulted from the testing of 300 genii in different fields (MORRIS COX, 1926), they looked for new directions in approaching creativity.

Then, the vision of creativity changed: the intelligence – creativity relationship was considered secondary, the entire human personality with its intellectual and non-intellectual factors being considered responsible for the development of the creative potential.

Intelligence is considered as the general aptitude of finding solutions for new situations, i.e. a capacity of adapting to the environment, an instrument of success (ANUCUȚA, 1999).

The relationship between intelligence and creativity is linear up to a critical point – above the average – beyond which a higher IQ does not guarantee concomitant increase of

creativity since other factors such motivation, imagination, environmental conditions, etc. also count in. Minimum IQ necessary for scientific creativity is considered by some 110, by others 115-120. Hudson considers that the inferior limit for the field of science could be somewhere around 115 IQ, while the superior one could be somewhere around 120 IQ. In fine arts, the inferior limit would be somewhere around 95-100 IQ, while the superior one could be around 115 IQ. Here, the share of special skills is much higher.

Anyway, intelligence is not homogeneous, since there are several types of intelligence – spatial, symbolic, semantic, and social. Scientific creativity correlates differently with these types: thus, somebody can be creative in one sense, but he/she can lack creativity in other fields.

On the other hand, they have proved that intelligence is related to a field of concern or interest (PIAGET, 1980). Upon maturity, too, formal operations are related to certain informational contents circumscribing a field of interest. Therefore, the correlation between intelligence and creativity should be analysed in relation to a field of knowledge, analyzing the correlation between specific creativity and specific intelligence, and not the correlation between specific creativity and intelligence in general.

MATERIALS AND METHOD

Within our research on a group of 33 pupils (Şcoala generală nr. 19) and 33 undergraduates (Universitatea de Ştiinţe Agricole şi Medicină Veterinară a Banatului in Timişoara) concerning the assessment of the level of creativity, we subjected our subjects to a set of practical tests of imaginations and creativity.

The methods of the research consisted of:

a) a medium difficulty quiz;

b) a documentary study of the creativity, imagination, and intelligence.

The answers we obtained to the tests allowed us to assess three intellectual factors of the creative potential, i.e.: fluidity, flexibility, and originality.

Fluidity refers to the richness of words, ideas, images, associations, etc. We noted the *total number of answers*.

Flexibility designs the restructuring ability of the mind, the ability of changing its course while solving a problem: it is the opposite of mind rigidity. We noted the *number of answer classes*.

Originality refers to the uniqueness of answers and their metaphoric degree. We took into consideration *frequency 1 answers or answers that were totally out of common.*

Some tests assessed verbal creativity (2, 3, 4, and 5), some others, figural creativity (test 1).

RESULTS AND DISCUSSION

Comparative means of the two sub-samples concerning fluidity, flexibility, and originality are presented in Table 1.

Table 1

Comparative means of fluidity, flexibility, and originality

Specification	*Fluidity*	*Flexibility*	*Originality*
Pupils	48.27	9.33	0.36
Undergraduates	79.75	10.24	0.24
Difference	31.48	0.91	0.12

We can see that, as expected, undergraduates' answers prove more fluidity (a difference of 31.48 answers) and answer classes (a difference of 0.91) than pupils' answers; as

for originality, though undergraduates' answers are comparatively higher (a difference of 0.12), we should mention that answers concerning this creativity factor were little represented in both sub-samples.

The second test asked the subjects to mention the possible resemblances between a set of pairs of objects, which pointed out verbal aspects of creativity.

Tables 2 and 3 show the answers to this quiz in both pupils and undergraduates.

Table 2

Possible resemblances between pairs of objects (pupils)

Sub-sample	Pairs of objects	Resemblances	Number of answers
Pupils	Potato – carrot	Are vegetables	34
		Grow in the soil	9
		Differ in weight	7
		Contain vitamins	6
		Serve to decorate foods	4
		Have different colours	2
		Are round-shaped	1
	Cat – mouse	Are animals	30
		Are enemies	6
		Live around the house	5
		Have tails	5
		Are small	3
		Have fur	2
		Have different weights	2
		Have 4 legs	1
		Have whiskers	1
		Are mammals	1
		Are quick	1
	Violin – piano	Are musical instruments	31
		Are made of wood	8
		Sound	8
		Have strings	7
	Milk – meat	Are foods	31
		Are of animal origin	9
		Are used as foods	3
		Are dairy produce	2
	Radio – telephone	Are electronics	17
		Can be listened to	10
		Make noise	3
		Are made of metal	2
		Have buttons	1
	Watch – typewriter	Are electronics	11
		Are metal objects	4
		Play an important role	3
		Serve to decorate the house	2
		Make sounds	1
	Curtain – carpet	Are made of textiles	11
		Serve to decorate the house	10
		Are made of cloth	3
		Are made of silk	3
		Are made of wool	2
		Are tailored	2
		Are simple elements	1
	Tractor – train	Are vehicles	15
		Are used by humans	14
		Are large machines	4
		Use fuel	2
		Have engines	2

Table 3

Possible resemblances between pairs of objects (undergraduates)

Sub-sample	Pairs of objects	Resemblances	Number of answers
Undergraduates	Potato – carrot	Are vegetables	21
		Are edible	15
		Grow in the soil	6
		Are used as foods	4
		Have a peel	3
	Cat – mouse	Are animals	16
		Live around the house	8
		Have whiskers	6
		Have tails	5
		Have 4 legs	4
		Have furs	4
		Are not edible	2
		Can run	2
	Violin – piano	Are musical instruments	20
		Are made of wood	5
		Have strings	4
		Make sounds	3
	Milk – meat	Are edible	16
		Are foods	12
		Are of animal origin	6
		Have proteins	2
		Have fats	1
	Radio – telephone	Transmit information	14
		Have buttons	6
		Are electronics	6
		Are breakable	5
	Watch – typewriter	Are noisy	13
		Have buttons	10
		Are electronics	7
		Are breakable	2
		Can be set	2
	Curtain – carpet	Are used to decorate the house	6
	Tractor – train	Are vehicles	6
		Have wheels	2

Of the pairs of objects, most resemblances were found in the "cat – mouse" pair (11 in pupils and 8 in undergraduates): their common characteristic of being animals (a single pupil mentioned they are also mammals), the fact that they live around the house, the fact that they have tails, four legs, furs, and the fact that they can run. In pupils, the fact that they "are enemies" comes second, while undergraduates underlined the fact that they are "not edible". The pairs "violin – piano" got lesser answers in both sub-samples, while in undergraduates the pair "curtain – carpet" is "used to decorate the house".

Another way to study creativity through its three basic characteristics consists of stimulating the pupils to find as many *unusual* features as possible in the objects subjected to them, as follows: button, key, chair, newspaper, charcoal, knife, sieve, and ring.

We should mention that, though they were asked to find *unusual* features, the subjects (particularly the undergraduates) also indicated common uses as well. Here are the answers concerning the uses of buttons: while the pupils mention two common uses such as "are put on

clothes", "are used on clothes", they also mention some extremely unusual uses such as "the fairy of dawn passes through them", "a person's eyes", "a doll's house windows", and "secrets' carriers", undergraduates only give five common uses.

Table 4 presents the results obtained.

Table 4

Unusual uses for a button

Subjects	Answers	Percentage
Pupils	A plate	14.28
	A flea basin	11.42
	The dawn fairy passes through its holes	11.42
	Hides shiness	8.57
	Is put on clothes	8.57
	A person's eyes	8.57
	A flying saucer for bugs	5.71
	Helps keeping things	2.85
	Flies pass through its holes	2.85
	A car's wheel	2.85
	A doll's house window	2.85
	A secret carrier	2.85
	A snowman's eyes	2.85
	A space ship "start" button	2.85
	A bomb	2.85
	Is used in clothes	2.85
	A medallion	2.85
	A coin	2.85
Undergraduates	An ornament	28.50
	It closes the clothes	10.71
	A closer	7.14
	It is used for clothes	7.14
	A dwarf table	7.14
	A coin	3.57
	A die	3.57
	Children play with it	3.57
	A coin for carriages	3.57
	A key-holder	3.57
	An arm	3.57
	Is used in making "martisoare"	3.57
	An ear-ring	3.57
	A dwarf ball	3.57
	A car wheel	3.57
	Can be thrown to enemies	3.57

Of the answers given to another 5 question test, we shall only refer to the answers given to 2 of the questions, i.e. "What should a teacher do for the pupils to learn better?" and "What should we do for the people to be more honest?"

Table 5

Answers to the question "What should a teacher do for the pupils/undergraduets to learn better?"

Subjects	Answers	Percentage
Pupils	Not to curse	8.62
	Not to behave badly	6.89
	To explain	6.89
	To joke	6.89
	To give good grades	5.17
	To be understanding	5.17
	To teach well	5.17
	To be indulgent	5.17
	To dictate well	5.17
	To scold them	3.44
	To teach them	3.44
	Not to get angry	3.44
	Not to give too many homework	3.44
	To be severe	3.44
	To practice with the pupils	3.44
	To turn everything into a game	3.44
	Not to pass tests	1.72
	To turn classes funny, relaxing	1.72
	To motivate the pupils to learn	1.72
	To beat the pupils	1.72
	To give the pupils money	1.72
	To only give the highest grade (10)	1.72
	Not to turn pupils into second examinees	1.72
	To let pupils go home instead of teaching	1.72
	To be patient	1.72
Undergraduates	To be communicative	27.02
	To be understanding	21.62
	To have good relationships with his undergraduates	16.21
	To be patient	13.51
	To be fair	8.10
	Not to be severe	5.40
	To teach well	2.70
	To joke	2.70
	To be open	2.70

The skills a teacher should have to make his/her pupils/undergraduates better learn are, in the latter's mind, communicativity, understanding, positive inter-human relationships, positive traits of character, pedagogical skills (tact and call), sense of humour, and availability. In pupils, surprisingly, there are solutions that might suggest improper behaviour of the teachers ("not to curse", "not to behave badly", and "not to get angry"). Pupils supply some solutions common to undergraduates too (pedagogic skills, sense of humour, understanding, indulgence, patience, etc.). Anyway, the number of solutions supplied by the pupils (even if contradictory) are more numerous than those of the students.

Table 6

Answers to the question "What should we do for the people to be more honest?"

Subjects	Answers	Percentage
Pupils	To have better paid jobs	22.22
	To trust each other	7.40
	Not to lie	7.40
	To be educated	7.40
	To be fined	3.70
	Not to cheat	3.70
	Not to steal	3.70
	To have anything they need	3.70
	To love their parents	3.70
	To get 10.000 € monthly	3.70
	To imprison the bad guys	3.70
	To attend church more	3.70
	To develop a bad guy detector	3.70
	To stop crimes, fights	3.70
	To get help when needed	3.70
	To observe all the rules	3.70
	To work less	3.70
	To be threatened with whipping	3.70
Undergraduates	To live a decent life	24.13
	To stop corruption	17.24
	To be honest	13.79
	To diminish unemployment rate	13.79
	To trust each other	10.34
	To diminish criminality	6.89
	To be educated	6.89
	Not to lie	3.44
	Not to steal	3.44

Correctness and honesty are, for both pupils and undergraduates, related not only to material conditions (decent life, unemployment, better paid jobs, on one hand, and trust, respect, love, faith in God, on the other hand) but also to proper human relationships (lack of corruption, violence, crime, ignorance, lie, theft).

CONCLUSIONS

- We need to develop a creative scientific climate covering the entire ensemble of the material factors of external psycho-social factors that favour or inhibit creativity. These factors can exist around the creative potential (family, school, labour environment) or can be farther (political regime, social and economic factors, general cultural state).

- The family should observe certain principles if it is to develop a creative climate (MUNTEANU, 1999): democratic family authority, precocious and intensive education, precocious enhancing of initiative and intellectual independence, freedom of communication, habit of reading currently newspapers and magazines, reasonable interest in the children's school record, encouragement, development of self-confidence, well-intended criticism, reasonable risk-taking practice.

- The teacher's personality plays an important role. There are two types of teachers: enhancers and inhibitors. Inhibitors are apodictic, hyper-critical, lacking enthusiasm, rigid to dogmatic, discouraging self-expression, unavailable outside class. Enhancers organise their

classes informally, encourage free expression, stimulate independent work, and are available outside class.

- There is no significant direct proportionality between school level and level of creativity. Undergraduates supplied answers below expectations and have a low creativity level.
- Educational climate should overrun certain rigid mentalities in assessing the pupils/undergraduates to facilitate their creativity.
- Intelligence is at the basis of creativity together with other specific skills, but its role is not always the same in the different forms of creativity.

LITERATURE

1. ANUCUȚA, LUCIA, "Psihologie şcolară", Timişoara, Editura Excelsior, 1999
2. MUNTEANU, ANCA, "Incursiuni în creatologie", Timişoara, Editura Augusta, 1994
3. PALICICA, MARIA, "Prelegeri de psihopedagogie", Timişoara, Editura Orizonturi Universitare, 2005
4. ROCO, MIHAELA, "Creativitate şi inteligență emoțională", Editura Polirom, Iaşi, 2001
5. TORRANCE, E.P., "Resistence to Premature Gestalt Closure as a Possible Indicator of Incubation Ability", in Journal of Creative Behavior, nr.1, 1992