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Quadruple Thinking: Creative Thinking

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Abstract

In this study, creative thinking from quadruple thinking (critical, creative, caring and hopeful thinking ways) is discussed. It is given the etymology of the term, history of creativity thought, its dimensions and the supporting thinking ways. Besides, the creative thinking is compared with uncreative thinking. At last, the quadruple thinking is shown in the relationships between creative thinking and other thinking ways (critical, caring and hopeful).

Keywords: Thinking, Thinking Education, Creativity, Creative Thinking

1. Quadruple Thinking

One of the most important tasks of education is to teach the students the ways of right thinking. Philosophy has tried to do this throughout the history. With the beginning of the twentieth century, the education has taken over this task and aims to give accurate information and bring correct thinking skills to students and aims to bring the thinking skills. Between the models trying to teach the students right thinking, the model of Matthew Lipman (2003) stands out.

The works of Lipman, which began with the adventure of "Philosophy for Children" in sixties starts with the book titled "Philosophy Goes to School" and continued with the books "Philosophy in Classroom" and story and exercise books according to age and seems to be punctuated with the work titled "Thinking in Education" written in 2003. Initial works of Lipman has addressed to the issue how can be integrated the philosophic examinations to the education. With the following works application samples of such an examination are given according to the age and fields. And the work titled "Thinking In Education" is a theoretical expression of philosophical examinations of Lipman. Lipman has suggested 3 types of thinking for teaching thinking. According to him, the thinking skills can be given to the individuals by educational systems teaching critical, creative and caring thinking. "Thinking Education" course which began to teach in the Turkish Educational System in 2006, has taken the ideas of Lipman as a basis (Dombaycı, Ülger, Gürbüz and Arıboyun, 2008).

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However, there are some problems related to Lipman's model:

a) The model is greatly philosophical weighted.
b) They are the ones which can be taught by the teachers, who have the necessary background and want to teach them purposefully, not by ordinary teachers.
c) It is not clear how to measure and evaluate them.
d) It is difficult to establish its relationship with educational science.
e) It has some aspects not suitable for Turkish people and some other societies; It may not meet all needs of societies about thinking.

In China, with feeling this lack, an amendment in the system is made and added collaborate thinking as fourth (http://src.tpc.edu.tw/te/upload/064/12_ 故事的提問討論與思考啟發_候秋玲.pdf). It is observed that the students are desperate and not willing to produce alternative solutions for problems at the applications in Turkey similar with China.

As a result, for releasing the thoughts of Lipman from philosophical weighting and be able to respond better to the needs of the Turkish people, a way of thinking that combines four thinking in 4-dimensional model or quadruple thinking model is developed. While the term four-dimensional thinking, expressed four ways of thinking, thinking means if this four thinking ways putting together in an appropriate way.

Lipman considers the positions of this thinking ways relative to each other, but not emphasized on structural questions such as how to differ from each other in terms of characteristics.

Following are the general characteristics of this model:

a) It is educational based.
b) It includes the skills, that can use by each teacher
c) It is easy to measure and evaluate
d) It sets out clearly the relationship with education, psychology and philosophy.
e) In consideration of the needs of Turkish society, "hopeful thinking" is added to three thinking ways of Lipman.

According to the model proposed here, thinking ways can be considered in two dimensions: cognitive-affective and convergent-divergent.

	Convergent	***Divergent***
Cognitive	Critical thinking	Creative thinking
Affective	Caring thinking	Hopeful thinking

First of all, thinking ways are divided into two as cognitive and affective weighted. Accordingly, while critical thinking and creative thinking is mainly cognitive, caring thinking and hopeful thinking is mainly affective thinking ways. Thinking ways are divided into two in consideration of the rules to taken fore or not and to get one or more results. While critical thinking and caring thinking taken to abide the rules (convergent) in the foreground, creative thinking and hopeful thinking (divergent) gives an elastic rule structure. When considered from a point of view, to comply with the rules associated with the mind, while disobeying the rules seem to be associated with intelligence. While mind express the rules of logic required to observe by thinking, which are suitable both critical and caring thinking, the intelligence refers to transcend the rules, which are suitable both creative and hopeful thinking.

2. Creative Thinking

If four ways of thinking is associated with each other, the creative thinking is similar in terms of the cognitive with critical thinking and in terms of absence of the rule set with hopeful thinking. Although the creative thinking includes cognitive and affective elements like other ways of thinking, it mainly involves the use of cognitive processes.

2.1. Etymology

The word *creative* is derived from the verb *to create*. This means "the ability to create". As the Jewish-Christian-Islamic tradition, also in Turkish, especially care is shown to hold aloof godlike creation and avoid and keep off the word *create* with saying "to create pertains to Allah." In this respect, *to create* and *to be creative* are not the desirable features for human. The actually gained meaning of the word and its expression of human creation has appeared after the age of enlightenment. (Create, 2010).

In the daily language, the word (yaratmak) can be used with the meaning "to provide work for a job" (işe yaratmak) (Yaratmak, 2010). Yaratmak (to create) is the causative form of yaramak. In ancient Turkish, in addition to the word *yaratmak,* the words *törütmek*, *yasamak* are also used for the same meaning. The word *creative* in English is derived from the word *create*. The word *create* has an interesting. Its etymological roots have also the meanings "grooving, developing".[2] And its actually relation with its today meaning (creativity) has shared the meaning "going beyond the actually situation". *Creative* action develops the existing state.

2.2. What Is Creativity?

The difference between man and animal has occupied the minds for a long time. The solution for this was often the opinion that the animals act with instincts and the man with mind. When considered from another point of view, the animals finds with instincts and man solves with intellect to the confronted problems. Instinct suggests a single solution and human intelligence offers several possible solutions and alternatives, and this is indicative for divergence of creative thinking. . Thus, creativity is the distinguishing feature of the man from the animal (Kim, 2007). The man has produced creative products differently from animals and transformed it into civilizations.

There is no consensus on the definition of creativity. Creativity often describe as "seeing the same and thinking different", "the ability to solve aesthetic problems", "gathering the problems not former put together", "to be sensitive to problems, troubles, lack of information, items of the missing, non-compliance and identify difficulties, seek solutions and to make estimations" and "bringing unusual solutions to the daily problems". One of the most important and accepted skills of our day are originality and usefulness. For this meaning, to be creative, we need to create new and useful things. Producing only new things is not a sufficient criterion for creativity. Useful products made should be solving a problem. Or even, they gain or lose creativity based on the problem they solve.

The factor making the creativity as complex is that the creativity in art places in front. When the creativity is talked about, it reminds the artists' works. In Lipman's model, the creativity gets related with aesthetics and it satisfies the goodness sense in human. The creativity shows itself in two dimensions: context and content. That is, the creativity means an idea to appear in a specific context or content. Although this definition contains also the artistic creativity, it comprises to put forward any intellectual product. Still, artistic creativity comes firstly to the mind.

Actually, the factor making creativity hard to understand is the indefiniteness related with its nature. From this point of view, it is an action (creative action), a person (creative one), a product (created work) and a context (context for creativity). These are referred as Mooney's 4 P's in literature: Process, person, product and place (Richards. 2007). To be used creativity for four different meaning gets harder its evaluation.

Is creativity a skill, a talent, knowledge, a product, a method? That is why it is hard to describe. Sternberg (2007) thinks that creativity is a habit. This thought lies on the base on creative education. Habit is another name for skill. It is a habit so it can be trained.

Lipman (2003) said that creativity is based on aesthetics. This is seen as an approach that connects creativity to fine arts. However, in a large aesthetical sense, or "critical thinking on arts, culture and nature" (Aesthetics, 2010) (and even language!), we can see the connection between aesthetics and creativity. Creativity is a way of thinking as connected with culture and nature as with art. Beauty, as the basis of aesthetics, should be re-defined. When taken only as beauty, creativity should be limited with art. But creativity can be seen on many places and situations. As it

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[2] Europeans have given the name *crescent* to Ottoman Empire, implying the growth and development. *Create* and *crescent* words come from the same root, meaning "making and producing", "development and growth". (Create, 2010; Crescent, 2010)

is, beauty shall be: “a property that gives joy, meaning or satisfaction from a person, animal, place, object of idea” (Beauty, 2010). If taken like that, aesthetics finds its place and the connection between creativity and beauty and aesthetics becomes more apparent.

Concepts related to creativity are lateral thinking (De Bono), divergent thinking (Guilford) and free thinking. Lateral thinking conceptualized by De Bono is defined as the skill of thinking new ways to solve a problem by intelligence and logic. Creating new ways shows its connection with creativity (De Bono, 1995).

Free thinking is an individual’s skill to create his own thoughts without being tied to the authority thought or someone else. Even having guided the education system for a long time, this has no conceptual basis. It’s generally related to democracy (Free thinking, 2010).

Creative thinking is problem solving from a different sense. Because there is a problem as the problem cannot be solved by conventional means. Its solution requires creating new ways, or divergent thinking and side thinking. However it is hard to have a systematic creative thought and this is related to it being divergent.

2.3. History Of Creative Thinking

Creativity has been seen as a skill of God and its use by humans was not tolerated. From a artistic creativity point of view, that has been connected with God. In this manner art is copying a divine art or a result of divine inspiration. In any case, God is the source of creativity.

Creativity has gained its modern meaning at the age of enlightenment. In the eighteenth century, creativity was linked by imagination rather than inspiration. In the nineteenth century Galton saw creativity as a part of genius and said that it is a natural ability. Guilford is the one who gave the modern meaning of creativity.

Graham Wallas comes to mind when we think of the studies on creativity inside the science of psychology before Guilford. Wallas saw creativity process as five stages: preparation – brooding – hatching – enlightenment or insight (Haefele, 1962). In our day this method is included in education psychology books as learning through understanding.

Guilford said there are two ways of thinking. Convergent thinking: using logic and knowledge to decrease the amount of possible outcomes, divergent thinking: foreseeing multiple solutions to a problem, having original and unique ideas. Creativity is seen as a intelligent action that creates multiple solutions to problems by original and unique views (divergent) rather than limiting solutions by intelligence and logic (convergent). Guilford said both thinking method being together would be beneficial, but said that creativity thinking is more of a divergent thinking (Haefele, 1962).

Haefele (1962) summarizes the development of creativity thinking up till 60’s:

Wallas: Four stages, theoretically

Fatrick: Four stages, experimentally; they interweave

Vinacke: The four stages are a dynamic process

Rossman & Osborn: By subdiving, seven stages.

Hutchinson: Incubation= frustration.

Duncker: Form a model of search.

Bouthilet: Solution may forerun conscious explication.

Heidbreder: Find the rule.

Flesch: Absorption in the task undertaken is the creative personality highlight.

Laycock. Creation is hard, and the ability rare.

Lehman: Creative ability reaches an early maximum. (p.236)

Arthur Koestler (1964) is a pioneer writer and thinker on creative thinking. He says on this book *The act of* creation:

“The creative act is not an act of creation in the sense of the Old Testament. It does not create something out of nothing; it uncovers, selects, re-shuffles, combines, synthesises already existingfacts, ideas, faculties, skills. The more familiar the parts, the more striking the new whole.” (p. 119-120)

Gardner (2006) said that creative will be one of five minds that will shape the future. He showed internet sites such as Wikipedia, google, amazon etc as an example for this.

Boden (2004) split this as creative pshycological creative (p- creativity) and historical creative (h- creativity). It is p- creative if you make something original for yourself, it is h- creative if it is the first in history.

Another view on creative that needs mentioning is of Mihaly Csikszenthmihalyi (1996). According to him creativity is not a work of a person of a group but a product of three private elements. First there is a specialized individual, then a cultural ground or subject that the creativity will be placed on, and lastly social relations that will evaluate and spread the creativity. Creativity happens when those three meet. According to this an individual cannot be creative, a specialized individual with a social environment regarding the subject can be creative.

2.4. Features Of Creativity

Creativity as understood today is based on thoughts of Torrance that were based on the conceptual basis of Guilford. Lipman's thoughts arise on the grounds of thinking education.

Guilford says that creative thinking has eight important elements (Haefele, 1962):

1. Sensitivity to problems (needs, seeing the unconventional)
2. Fluidity (multitude of thoughts and associations)
3. Flexibility (getting rid of thinking laziness and adaptive set)
4. Originality (not having a general impulse)
5. Dominance (dominance on the situation and having divergent associations)
6. Analysis (defining, recognition)
7. Synthesis (closure ability)
8. Redefining

Those properties of creative thinking also fit convergent thinking. But there are two exceptions. Redefining is closer to convex thinking. Properties defined as sensibility to problems are properties of evaluative thinking and closer to critical thinking, despite defined as a property of creativity by Torrance (Haefele, 1962)

Guilford's thought can be simplified to four elements as below:

1. *Flexibility*: not sticking to certain solutions for a problem.
2. *Originality*: creating thought different than the others'
3. *Efficiency*: creating more than one solution suggestion to a problem.
4. *Elaboration*: dealing with problems with a detailed manner.

Torrance then developed a scale that comprises the four properties of Gilford on creativity and made it useful on education grounds. The Torrance Tests of Creative Thinking (TTCT) by E. Paul Torrance has three components:

1. Thinking Creatively with Pictures measures creative thinking using three picture-based exercises to assess five mental characteristics: fluency, originality, elaboration, abstractness of titles, and resistance to closure

2. The Figural TTCT contains abstract pictures and the examinee is requested to state what the image might be.

3. The Verbal TTCT: contains presents the examinee with a situation and gives the examinee the opportunity to ask questions, to improve products, and to "just suppose." (Aslan, 2001)

Lipman (2003) says that there are four primary aspects regarding creativity on his model. Those are: Imaginative, holistic, inventive and generative.

Lipman (2003) evaluated the creativity process and below are the properties of this process;

- *Originality*: The product being a product that hasn't been in the repertoire.
- *Productivity*: Creativity is a fertile pursuit. It creates a product.
- *Imagination*: Imagination lies at the base of creativity. Creative people create new things with their imaginations.
- *Independence*: Dependence to something is the worst obstacle for creativity. Creativity requires independence.
- *Experimentation*: Creative people generally test their solutions the way they found them.
- *Holism*: Creativity generally means a whole, complete solution.
- *Expression*: Creativity especially shows itself in a person's self definition. This is his/her individual nature.
- *Self-transcendence*: Creative people transcend themselves, pass beyond the present situation
- *Surprise*: Creativity generally creates a weird product and causes surprise. Creativity people love the nature, their products have people around them in awe.
- *Generativity*: Creativity brings forth and suggests multiple solutions. Creativity means multiple solution ways.

- *Maieuticity*: Maieuticity, known as the Socrates' method, means defining present situation and finding new solutions. It requires a different look to present elements.
- *Inventiveness*: Inventiveness is the most accepted property of creativity. Creative people find new ways, create a new art.

2.5. Dimensions Of Creativity

Dimensions of creativity can be linked with Bloom's taxonomy. As you know the new taxonomy of Bloom has creativity on top of cognitive area. Creativity here has four dimensions. Those dimensions also show a leveled structure.

1. *Imitation*: imitation is the first step of creativity. In this stage people and works done are imitated. A good example can be seen on artistic creativity. A person first imitates the art of famous artists. He tries to capture the fine techniques there. Creativity is new for this person, but not for the society or history.
2. *Relocation*: In this stage the person starts to use a known object, method or action somewhere else. In a sense this stage is the redemption step from function that is one of the obstacles of creativity. This type of creativity can be seen in children. Children take an object and use it something else, thus having creative behavior.
3. *Making connections:* this stage is a more complex level of relocating. The person connects two objects that are not related, far from each other. He makes a never-before connection. This is the group which daily life considers as real creativity.
4. *Method development*: In this stage the person has created a new method with creativity and others start to imitate him with that method. This stage makes him a master.

Made useful with that, creativity has eight properties, four cognitive, four affective.

1. *Rationalism:* Creating as much solutions as possible
2. *Flexibility*: Thinking in different ways.
3. *Originality*: Creating solutions that are different from others'
4. *Elaboration*: Detailing.

Those four properties are cognitive and are set by Guilford. These are supported by affective properties.

5. *Curiosity*: Creative people are curious people.
6. *Complexity*: They are intellectually complex. They handle situations in a different and complex manner.
7. *Risk taking*: They look for unconventional solutions and take risks. They take risks by looking for the yet unknown.
8. *Imagination*: They have strong imaginations (Haefele, 1962).

2.6. Creative And Uncreative Thinking

Thinking that is conventional, devoid of creativity is called uncreative or traditional thinking. Uncreative thinking is a method of thinking that doesn't pass beyond what has been given. That is the thinking method named as traditional education and opposed by many. This thinking method is doing what everybody is doing. In this thinking method the person sees as other people, acts like other people.

Creative thinking is based on the insufficiency of data and need for a different point of view. So creative thinking is the opposite of uncreative thinking or traditional thinking. Creative thinking sees what everyone else sees, but thinks differently.

According to Welsh's (1975) classification, traditional thinking is the method of thinking where intellectence (educated intelligence) and origence (originality) isn't present. Meaning it is devoid of intellectence and origence. Cognitive thinking, the equivalent of creative thinking, is high on intellectence and origence.

Factors that inhibit creative thinking are seen as the obstacles of creativity and are shown in five groups (Rıza, 1999):

1. *Emotional barriers*: Shyness, fear befooling and being misunderstood, lack of tolerance and over self criticism.
2. *Cultural barriers*: Examples of cultural barriers are not valuing imagination and creativity seen as childish.

3. *Learned barriers*: Obsessing on usefulness, possibility expectations, divine taboos are learned barriers.
4. *Cognitive barriers*: Conventional cognition traditions are on this group.
5. *Loaded program barriers*: Education programs inhibit creativity.

2.7. Forms Of Thinking That Support Creative Thinking

The methods of thinking that support creativity thinking, according to Lipman (2003), are as below:

2.7.1. Amplificative

It can be discussed in two dimensions as implicative thinking sampled by deduction, amplicative thinking using analogy and metaphors. Amplicative thinking passes beyond what has been given and enables our thinking to grow. As it is, creativity thinking is amplificative.

2.7.2. Defiant

Defiant thinking is another method of thinking that supports creativity thinking. Creativity thinkers generally defy (break) rules and criteria, which is generally true.

2.7.3. Maieutic

Lipman says that thinking is intellectual midwifery. Maieutic thinking is extractive,eductive, seeking to elicit the best positive thinking possible from one's charges.

2.8. Creative Thinking And Other Ways Of Thinking

2.8.1. Critical thinking

Creative thinking has to investigate the solutions given before it in order to be creative. As it is, critical thinking comes before creative thinking. Also, the product that has resulted from the creative thinking has to be evaluated with critical thinking.

That is the main property that separates creative thinking from imaginative thinking. Creative thinking paves the way for creative thinking in defining the problem. It helps in "keeping its feet on the ground" while evaluating the resulting product. In this manner, creative thinking comes before critical thinking and then returns to it.

From the model point of view, critical thinking and creative thinking have one thinking in common: cognition. Both are cognition-heavy thinking methods. Also the table below shoes the differences between critical thinking and creative thinking (Fisher, 2004):

Critical	**Creative**
Analytic	Productive
Convex	Divergent
Vertical	Horizontal
Possibility	Probability
Judgement	Suspective judgement
Hipothesis testing	Hipothesis creating
Objective	Subjective
Answer	Any answer
Left brain	Right brain
Close ended	Open ended
Linear	Evocative (connective)
Reason	Inference (speculation)
Logic	Instinct
Yes but	Yes and

2.8.2. Caring thinking

Caring thinking generally provides the rules that thinking must obey. It deals with the thoughtful rigor and rules and principles required for this rigor. In this manner, there is a rigor relationship between caring thinking and creative thinking. Careless creative thinking would be imaginative thinking. Caring thinking makes the evaluation of the products of creative thinking with a systematic thinking based on the principles of critical thinking. Creative thinking is seen akin to careless thinking (non-caring thinking), but alternatives created has to be investigated in a systematic manner and this is done by caring thinking.

2.8.3. Hopeful thinking

Creative thinking needs hope in order to go beyond alternatives, break the rules. A creative thinking without hope cannot find solutions to problems. In this manner, hopeful thinking is the most comprehensive of thinking methods. Also, one of the properties of hopeful thinking, path finding, is akin to the fluidity property of creative thinking. Here, a person that seeks many ways to the goal has to be creative, or find different and unconventional ways.

3. Conclusion

Creativity seems more linked with aesthetics in Lipman's model, but the scope of creativity narrows down. Also, the innovation / originality that is the main problem of creativity still has importance in education. Evaluation and education of those four methods of thinking has to consider that original property of creativity. Not everone can be historical creators, but everyone can learn to be a personal creator.

Lipman's education of thinking is heavily philosophical, and loses most of its applicability. Also, only critical, creative and regardful thinking is seen sufficient. People can be creative or regardful or critical when they have hope. Also, connecting creative thinking only with aesthetics and beauty doesn't limit it. In this manner, a quadruplet education shall teach students to really think right.

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