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Identifying Effective Creativity Techniques for Employees' Creativity (Case Study: Employees of School of Entrepreneurship of Tehran University)

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ABSTRACT

Our purpose is to study employees' level of creativity and identify the most common creativity techniques they use. In this regard, after the literature review, we used available resources in order to create questionnaires to estimate employees' level of creativity at School of Entrepreneurship of Tehran University. We analyzed questionnaires using SPSS software and descriptive and inferential statistics. According to the results, mean of score of the employees' creativity at School of Entrepreneurship is average and 56.7% of them have creativity at a very low to moderate level. We interviewed 16% of those who have the highest level of creativity in order to study impacts of creativity techniques on the employees' creativity; we identified and extracted the most common creativity techniques they use and they are brainstorming, DOIT, returning to customer, Why Why and Fishbone diagram. Eventually, we offered some innovative methods based on the research results in order to accelerate the employees' creativity process at School of Entrepreneurship and other similar centers.

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INTRODUCTION

Creativity, innovation and the ability to offer new and innovative products and services will separate companies from organization in the future; meanwhile, several obstacles have been placed in path of creativity and innovation in organizations. Ervin Right says if we look at or accept facts like others look at or accept them, there would be little hope for our progress or nothing at all. Employees' creativity help organizations to survive and when staff are creative at what they do, they would offer or use some new, useful ideas for products, performances, services and procedures in organization. [1] Such ideas can increase the possibility of usage and spread of ideas by employees. Creativity not only enhances market share through developing products and procedures but also create new markets and shape environment. Companies that do not care about creativity will have frozen procedures and they will not be able to face unpredicted problems in the future. Hereby, procedures will be more important than actions, tools will dominate objectives, and people will be prisoners of their procedures and regulations. When creativity exists, organization, shareholders, managers and staff grow and develop, customers of organizations demand more products and services, technology and competition improve and increase, costs of production and services decrease, and quality of programs improves.

Literature review:

Create word in Webster dictionary means being powerful and having an ability to produce. This word entered English language in the 17th century. Dubono said creativity word has a very complicated and confusing meaning. Ferom believed creativity is a thing that makes people transcend their passive, random nature and reach freedom and goals. Sholtez believed creativity is a combination of beliefs, thoughts, ideas, imaginations and attitudes a person had already known but now he or she is using or applying them in a new and different way. [2]

Guilford [10] believed creativity is a divergent thinking in order to find new solutions to problems. [3] Kayzer emphasized creative output and believed creativity means using mental abilities to produce an idea or concept. [4] Atrik (1976) believed creativity is a process of producing, developing and executing ideas. Amabil [2] said creativity is producing new and valuable ideas by one person or a small group of people who work

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together. Kontez and Odanell said creativity means launching a new product or a new service, or inventing a new method. Kauo believed creativity is a human process that leads to a new, valuable result. Loutanez believed creativity means creating a combination of solutions by people or groups in a new way. In definitions of creativity, emphasis is on creative output, procedure, and the origin of creativity, creative individuals, problem solving, and the kind of thinking respectively [5].

2-1. The most common theories of employees' creativity in organizations:

✓ Attribute theory: according to this theory, some specific features and characteristics of a person make him or her creative. Proponents of this viewpoint say most of creative people have common characteristics; they are openness to change, self-reliance and spontaneous, and they have new ideas and quick perception. According to the theory, an organization should have inherently creative people to become a dynamic one.

✓ Conceptual-skills theory: given this theory, creativity results from conceptual skills with a focus on cognitive activities. People recombine their old knowledge in order to extract new framework and results. Thinking and changing the framework of thoughts and models are being done in outmoded methods.

✓ Behavioral theory: this theory focuses on activities and events that lead to creativity.

✓ Process theory: according to this theory, creativity is a complex process and it depends on individual skills and activities. Moreover, it depends on organizational conditions and combined impact of these two factors brings creativity. Organizational conditions can influence a person's attitude towards duties and expectations and it is the well-known impact of Role Theory. Clarity of members' expectations in an organization might be helpful in process of understanding and identifying issues that require creativity [6].

2-2. Origin of creativity:

The concept of creativity engenders based on its most important sources and origins such as subjective information, sensory information, confliction, environment, gene, impeccability, mistake, prior knowledge, unexpected events, incompatibility, process needs, changes in industry, market, population, perception and new knowledge. For instance, regarding subjective information, Plato (322-384 BC) emphasized the mind's eye and believed subjective information is a real knowledge. However, Aristotle believed sensory experience as well as subjective information is basis of ideas, those ideas that result from sensory experience create other ideas based on rules of similarity, contrast, proximity. Moreover, he emphasized achieving sensory information through sense by interaction with environment. [7]

Many factors influence organizations and employees' creativity such as individual, cultural, structural, managerial, environmental factors. Getzels and Jackson applied some Torrance Tests of Creative Thinking and stressed role of critical thinking skills for smart people. [8] Roger and Speary believed the brain and its structure, and right and left hemispheres of the brain have impacts on individuals' creativity. [9] Alex Sborn and Edward Debono emphasized role of education and learning creativity techniques. [10]

In this paper, we study employees' level of creativity at School of Entrepreneurship of Tehran University. This is the only school in Iran that its students are learning variety entrepreneurial-oriented subjects and disciplines particularly. Some examples of creativity techniques based on experts and professors' opinions at School of Entrepreneurship are as follows.

1. Creativity techniques:

1. Conceptualize or Brainstorming Technique:

Osborn offered this common and well-known technique for the first time. It has a simple application, experienced and inexperienced people can use it. In a brainstorming session, a group of 6 to 12 participants, a facilitator and a secretary gather and time of the session is 20 to 45 minutes. Participants are encouraged to produce and exchange their ideas and opinions freely, the members of the group will be aware of topic and the facilitator will ask them to come up with new solutions and ideas as many as they can. His or her role is to guide them towards valuable ideas. In this technique, ideas receive no criticism and judgment will be suspended. During one session, the group freely provides ideas even unrelated and impractical ones. Participants modulate and combine their ideas, when they have many ideas, they will be considered ad more appropriate ideas. [11].

2. Intellectual writing or the Delphi technique:

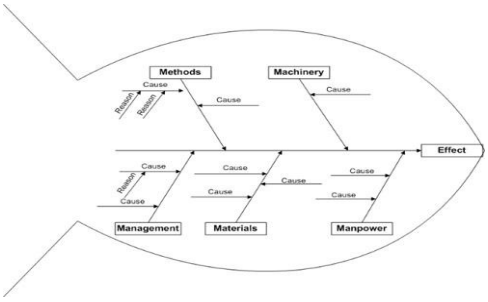
Dalkey and Helmer introduced this technique in 1964. It is very similar to brainstorming, the only difference is people do not gather as a group in a session around a table, in fact, there is no direct confrontation. People in a brainstorming session could not offer some of their ideas because of shame and embarrassment. Hence, there is no face-to-face conversation. Head of group declares the topic and each person sends their ideas in writing (even anonymously) to the head of the group. Then he or she sends all the suggestions and ideas to each person and he or she asks them to think about the others' ideas and if they have a new one, add it to them. They do this action several times until they become unanimous in it. The Delphi technique includes an invitation to consult and compare a matter several times anonymously. [12] When we use the Delphi method?

✓ When you want to know members' opinions of a team without facing them due to the probability of error in judgment
✓ When members of a team are not in a same place
✓ When members of a team must be fully aware of and responsible for their decision and its consequences
✓ When authorities and peer pressure affect decision-making

3. Fishbone diagram (cause-and-effect):

Fishbone diagram is one of the most useful methods to identify problems. Sometimes Fishbone diagram is called Ishikawa diagram because Professor Kaoru Ishikawa from University of Tokyo designed it. The main purpose of this technique is to identify and provide a list of all the possible matters related to the problem. It is mainly teamwork in order to identify matters but an individual also can apply it as follows:

✓ They write the problem in an oval on the right side of a paper. (Fish's head)
✓ They draw a direct line from the main problem to the left. (Fish's spine)
✓ They draw a stem (it is Fish's bones, they write the main problem on it, and the most important matters must be closer to Fish's head).
✓ They add branches to it to indicate causes of the problem. [14] In the figure below, we explained the Why Why technique by an example.



Picture 1: Fishbone technique.

4. Why Why diagram:

We write problem on the left side of a paper and write a why word on it and on the right of the problem, we write the main causes of the problem that explain the reason of the problem then we connect them to the problem. We repeat the first and second steps as much as possible to achieve better results. [14] The diagram below is an example of this technique.

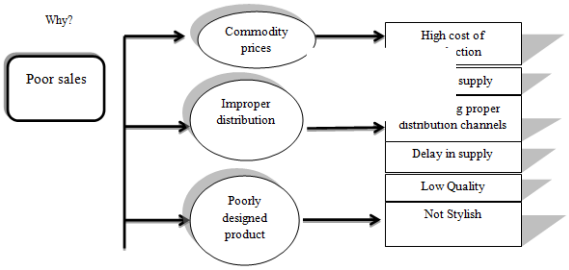


Fig. 2: Why Why technique.

5. PMI technique:

One of the values of this technique is its ability to make people to think against their frame of mind for minutes and they will be more dominant and more aware of their frames of mind gradually, they will be more mentally prepared for creativity. PMI stands for "Plus/Minus/Interesting".At first, an individual focuses on positive aspects of a topic or an idea then on negative aspects and finally on its new and interesting aspects that are neither positive nor negative. He or she provides a list of positive aspects or benefits of the topic, a list of barriers, limitations and negative aspects of the topic, and a list of new and interesting aspects. One of the most important usages of this technique is when we are sure about the topic not when we doubt it. In other words, whenever we are really pessimistic or optimistic about a matter, this technique will be more useful and effective. In order to find interesting aspects, we should complete "How interesting it would be if…" sentence. [14]

DOIT technique:

DOIT stands for Define/Open/Identify/Transform. It means in order to solve a problem, at first, it is necessary to define and identify the problem correctly. Afterwards, we should keep our minds open for different solutions in order to identify the best solution and transform it to an action. [14].

6. Scamper Technique

The main usage of this technique is based on an individual's creativity method and it would be very beneficial for groups. The main purpose of this technique is the power of imagination to move it in different and necessary directions. This stimulation has created by a series of debatable questions, the individual will consider them and ask them from his or herself and by increasing ideas, their quality will be improved. SCAMBER stands for questionable terms that are very effective in achieving new ideas.

S stands for Substitution.
C stands for Combine.
A stands for Adapt.
M stands for Magnify.
P stands for Put to other uses.
E stands for Elimination.
R stands for Reverse. [15].

7. Returning to customer:

In this technique, by ignoring matters related to production and considering matters related to marketing, we can study the relationship between our and customers' activities regarding product, price, advertisement, distribution and market.

8. Synectics technique:

Synectics origin from a Greek word and it means pressing one thing against another thing or connecting several things together. This word is selected because creativity is somehow organizing several things in a new framework or structure and any innovative idea is related to Synectics technique. Synectics is a method for stimulating creative thinking among a group of individuals who come together. [16] Generally, steps of this technique are as follows:

- ✓ Identifying and defining the problem, analyzing it in order to reach its nature and essence (identifying essence)
- ✓ Relating the essence to an irrelevant matter (creating a similar situation)
- ✓ Discovering solutions to the similar matter (similar solutions) and trying to transform the solutions to final solution to the main problem

9. Computer programs technique:

We can use some of computer programs in order to create different solutions and methods and in other situations, add creativity to process of problem solving. Idea Fisher program is the most famous and powerful program in computing. [14].

10. Note taking technique:

People in different locations and times come up with some ideas. New thoughts and ideas are temporary; hence, the best way to keep them is recording. According to studies, 25% of an information someone reads or hears about will be forgotten in the first 24 hours and 85% of them will be forgotten a week. If we do not use them whenever they occur, we could record them as "new thoughts" case for the future. [18].

11. Scenario building technique:

Scenario writing means analyzing information, thinking about them and discussing potential future of an organization. Scenario writing is a complex technique and it requires considerable time and effort. Thinking about possible future is important. Sometimes, this technique is being used for formulating different strategies for different possible situations in the future. [14].

12. Subconscious techniques:

This technique relies on intelligence of the unconscious. This intelligence constantly sends different information into temporary and permanent memory. It is trying to force an individual to listen to new ideas result from subconscious mind to conscious mind and record them in order to find some new methods and solutions to his or her problems. [18].

Edison used mini dreams in order to develop his ideas. He used to hold some pebbles in his hands and think about a matter. He allowed himself to sleep while he was thinking. Awhile later, the pebbles started to fall down

and made noise; he woke up and started to rethink about that matter. He used his subconscious by this technique. [16].

13. Absorption technique:

After studying and analyzing ideas, we should classify proper ideas from the most important to the weakest and then consider them as a magnet that absorbs everything. Absorption technique moves people to action. After we come up with a valuable idea, all our organs and the universe help us to achieve that, in the Holy Quran, human is considered as successor of God on earth.

Methodology:

People in an organization do not have the same capacity for creativity. Hence, it is necessary to manage their ability properly. Because if everyone has the same capability in this regard, creativity would be considered as an ordinary characteristic and there would be no need to manage or provide a situation to create them and the only focus would be on a way to use its results. Therefore, it is necessary for managers of an organization to train and increase employees' creativity.

It is a descriptive research and we did it by survey studies. Theoretical foundations and the research background are based on resource library, database information and refer to experts. We used questionnaires, interviews, documents, discussions for data collection.

This research has two steps called identifying employees' level of creativity at School of Entrepreneurship of Tehran University and prioritizing the most common techniques that those employees apply. In the first step, we referred to the literature of the topic and determined some techniques in order to identify and localize creativity techniques; we offered them to three certified professors to study their amount of influence at the school. This step included interviews and discussion, and our purpose was to identify the employees' creativity techniques. We used descriptive statistics such as frequency, percentage, frequency distribution tables and mean for data analysis.

Results:

Sample is employees of School of Entrepreneurship of Tehran University. 35 of them received questionnaire of creativity test, 30 of them returned them. Results of distribution of gender and education variables are as follows:

Table 1: Gender distribution of the staff.

Frequency	Number	Gender
40	12	Male
60	18	Female
100	30	Total

Table 2: Education distribution of the staff.

Frequency	Number	Education
16.7	5	Diploma
10	3	Associate Degree
30	9	Bachelor
40	12	Masters
3.3	1	PhD
100	30	Total

Table 3: Descriptive Distribution Of The Score Of The Staff's Creativity.

Standard Deviation	Mean of score of staff's creativity	Maximum score	Minimum score
17.7	124	159	95

It should be noted experts and scholars have confirmed reliability of the research, and Cronbach's alpha is 0.93 and it indicates the reliability of the research. Questions of the questionnaire have three options, we calculated score of the staff's creativity and we classified their level of creativity in five categories.

Table 4: level of the staff's creativity.

Level of creativity	Creativity score
Very low	Less than 98
Low	99-113
Medium	114-129
High	130-144
Very high	More than 145

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According to the results, mean score of the staff's level of creativity in School of Entrepreneurship is 124. It is medium and in fact, their level of creativity is far away from creativity level of a creative organization. 56.7% of the employees have very little to medium creativity.

Table 5: Percentage of the employees' creativity.

Percentage	Level of creativity
10	Very little
23/3	Little
23/3	Medium
26/7	Much
16/7	Very much
100	Total

Given the descriptive information, women generally have a moderate degree of creativity (33%) and men generally have a high degree of creativity (41.7%). In order to study impact of creativity techniques on the employees' creativity, we interviewed 16% of those employees with high level of creativity and we asked them about their usage of creativity techniques in decision-making. The interviews included description and explanation of the problem of the interviewer, detailed answers and a discussion of creativity techniques. We studied impact of fourteen creativity techniques, we identified and extracted the most common ones after interviews, and the conclusion and results are as follows.

Table 6: The most common creativity techniques.

Percentage of usage of interviewees	Technique
%100	Brainstorming
% 60	DOIT
% 60	Returning to customer
% 60	Why Why
% 40	Fishbone

As you can see, those employees with the highest level of creativity at School of Entrepreneurship of Tehran University respectively use brainstorming, DOIT, returning to customer, Why Why and Fishbone techniques in decision-making and problem solving. We have explained these techniques in the previous sections.

Research findings and recommendations:

According to the results, mean of employees' creativity at School of Entrepreneurship is at a medium level. 56.7% of them have very little to medium creativity, we interviewed 16% of those employees who have the highest level of creativity in order to study impact of creativity techniques on the employees' level of creativity, we identified and extracted the most common creativity techniques and they are Brainstorming, returning to customer, Why Why technique, DOIT and Fishbone diagram. Men's level of creativity is generally higher than women's level of creativity. It is recommended to consider that carefully and try to increase it.

Dul, Ceylon, & Jaspers [5] believed usage of knowledge and creativity science in a physical environment is beneficial for employees. [19] Hence, according to the results our recommendations are as follows. Institutionalizing creativity in an organization: Generally, managers have three options. They can focus on one or more than one of them. The first one is recruiting approach and applying creative people. The second one is teaching and developing people's creativity for problem solving. In fact, it is applying a process that is based on creativity. The third one is improving environmental factors in order to increase employees' level of creativity.

Transfer and teach the most common creativity techniques to employees

Performing courses for teaching creativity techniques

Allocation of time to study employees' creative methods

Creating creativity committee

Supporting creative people and recording employees' creativity in an organization

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