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CREATION: creativity techniques to generate ideas of new products

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Abstract: This article aims to propose a new creativity technique to generate ideas for new products. The research method is characterized as action research due to the participation of researchers within the problem situation. The proposed technique, which was named CREATION – Clarify and explicit the context of the development, Relate about creativity and innovation, Explain the generation of words and elements, Apply and communicate the first word, Think fast the next words, Interpret and choose the words, Organize the words to construct ideas, Now expose the ideas – was conceived through interventions in organizations that manufacture handicraft products. For the application of the technique a dynamic that takes into account three phases is required to be used: Planning, Implementation and Analysis. During the application of the technique about 30 ideas have been generated, all considered new, in six sessions of the pilot test interventions in artisan communities.

Keywords: creativity, technique, generation of ideas.

1 Introduction

Innovation in the craft sector proves to be essential in order to meet market demand changes. In the past, the handcraft products used to have a long cycle of life, whereas in the present time, the cycles tend to be increasingly short, influenced by cultural and social changes of the society.

However, there is a difficulty in this sector regarding the adequacy of consumers' needs with the characteristics of their activity, causing changes to incorporate to the craft production process, changing its classification of purely art to a new classification with characteristics of industrial production, though keeping its root features, which is called "industrial handicraft" (FREITAS; ROMEIRO FILHO, 2004). This new system is characterized by its organization (association or cooperation), by the use of non-handmade elements and the insertion of the designer in the process.

The creation of new products is restricted to models presented by the designer, interfering in the development of the craftsmen creative potential. In order to develop this creative potential, practical interventions were performed, by means of creativity techniques inside Brazilian artisans communities, aiming to i) improve the features and functionality of the existing products and ii) generate ideas for creating new products.

However, only the first objective has been achieved satisfactorily due to the fact that the existing techniques are not adequate to generate communities' ideas, leading to the need to develop a new technique which would fulfill best the second goal. Thus, this paper aims to propose a new technique to generate ideas for the creation of new handicraft products.

This article is divided into six sessions; the first session is the introduction. The second considers the theoretical framework on the subjects regarding individual and collective creativity and creativity techniques. Then, the research method is presented. The fourth session considers the action research detailing through the application and improvement of the new proposed technique. The description of the technique, called CREATION, is made in the fifth session. The final considerations make up the sixth session, followed by the references.

2. Literature review

2.1. Individual and collective creativity

It is known that some qualified individuals present creative and innovative ideas, causing organizations to increase their competitive advantage. According to studies of Losito (2012) and Goldschmidt and Dan (2005) the contribution that these individuals present justifies the importance in having them as team members, as well as in consulting, in sports teams, cameramen, academic departments, start-up businesses, among others.

The generation of ideas can arise from persons working all alone or through members who develop their activity collectively, interacting with each other, whose level of creativity is determined by the ideas developed by Amabile et al. (1996) and Amabile (2012).

Two dimensions – diversity and familiarity – are presented by Losito (2012) as characteristics that affect the generation of collective ideas. The use of groups allows for integration and sharing of information knowledge and resources preventing that each organizational unit functions as an isolated core. Thus the collective creativity approach estimates the value added by each member their knowledge skills and experience to the group's global task (CATMULL 2008; HARGADON; BECGLKY, 2006).

Diversity plays an important role in the outcome of creative process. It allows a collaborative relationship and adds value to achieve innovation (GOLDSCHMIDT; DAN, 2005) representing the increase in access to information and knowledge from different areas which facilitates the exchange of experiences among the participants.

On the other hand the familiarity among the members of the group may negatively and positively affect the collective performance. On the negative side its experience and repetition as a source of creativity elevation are regarded as a trap because the closure caused by the group neutralizes the internal communication of their members hindering access to external information. On the positive side the familiarity creates strong ties among the members facilitating the coordination of the group and the sharing of information and knowledge.

Thus Losito (2012) concludes that the dimension diversity offers potential for application of high level of experience while familiarity among the members presents antagonistic mechanisms one associated with the shared understanding and the other associated with the lock in sharing procedures.

In this way you must know how to deal with these two aspects so that one complements the other. Familiarity is important for a better work environment and makes understanding easier among members but over time it becomes a lock to the external environment so it turns to be necessary to apply the diversity relocating the group members for example.

2.2. Creativity techniques to generate ideas for new products

Against a backdrop of constant technological changes and increasing customer demand the ability to adapt to this dynamic environment by developing new products presents itself as an effective alternative. Thus it is apparent the importance of enhancing the creative ability of individuals so that they are able to generate valuable ideas which may contribute positively to both the organization and society.

According to Amabile (1982) and Ritter et al. (2012) every person has the ability to be creative and one of the strategies used to awaken the creativity is to stimulate individuals to generate a continuous flow of innovative ideas through the application of creativity techniques.

However in order to enforce these techniques it must be done a preliminary study on the population participating of the method as regards the characteristics of the individual and the environment in which they are inserted as well as aspects of the organization involved besides having a strategy of openness due to the fact that this is something new.

In the literature various creativity techniques are presented in order to generate ideas for developing new products such as: bodystorming forced morphological connection Disney creativity strategy successive integration of elements listing lateral thinking questioning in series – "applied imagination" super group random figures/words THRIL – three double repetitions of the initial letter work with dreams and images.

3. Research method

The study it is part of an investigation of a research group at the Federal University of Brazil whose initial purpose was to awaken the creativity of artisan communities in the state in order to generate ideas of new products with the use of two creativity techniques (Random Words/Figures and Listing) by means of a dynamics (FERNANDES et al., 2013). Faced with the unsatisfactory result of the applied techniques – as a result of restrictions in the application of the techniques in the participant group as for example not associating figures and not emerging new ideas – we realized the need to consider a new technique with the same objective.

The search can be classified according to the purpose as exploratory because it seeks to provide a greater familiarity with the subject of study and descriptive in which from a fact the researcher observes registers and analyzes the elements of research correlates them analyze them and consolidates them in order to reach the final result according to the nature of the object being searched (CÁS, 2008).

As for the scientific approach this article is classified as qualitative since it has sought to deepen the understanding of the phenomena without worrying about numerical representativeness and statistical generalizations (TERENCE; ESCRIVÃO FILHO, 2006). Now with respect to the technical procedure used in the early stages the research is classified as an action research due to the participation of researchers on the problem situation (COUGHLAN; COGHLAN, 2002; FRENCH, 2009; THIOLLENT, 2009; MARTINS; MELLO; TURRIONI, 2014). Figure 1 represents a scheme-summary of the research method.

The first phase corresponds to the literature search on Creativity and Innovation and Creativity techniques the result of a systematic literature review that generated the analysis of 40 and 74 articles respectively. Initial visits were made to communities in order to provide a first contact with the artisans. After these visits interventions were planned and then performed.

Due to the unsatisfactory result of the first interventions a listing of negatives was made followed by a brainstorming session to construct a new technique that could assist in the generation of ideas for new products. A dynamic has been developed and the pilot test was applied. By analyzing the pilot test changes were made and validated and the new technique was applied in the communities which are objects of this study. Finally the analysis of the results obtained with the purpose of identifying the efficiency of this new technique was performed with a view to propose guidelines for its use subsequently.

4. Action research

4.1. Artisans communities

The communities studied belong to the State of Rio Grande do Norte in Brazil. They appeared in the same way as an opportunity to labor employment of women in the region through handicraft. It was requested a visit from SEBRAE (a Brazilian service to support micro and small enterprises) and training courses and market studies were conducted in order to analyze the abundant raw material in each region. Thus for the community of Lajes Pintada it was chosen the work with sisal fiber whereas for the community of Massaranduba the carnauba straw was the selected as raw material.

Several products are marketed by communities: purses lamps baskets coaster table mat set among others. Figure 2 presents the products from the communities.

With regard to the development of the artisans' creative potential a peculiarity is observed. In none of the objects of study there is a culture focused on creating and adding new products leaving that task to the designer sent by SEBRAE. The artisans are only delegated the functions of manufacturing products. In addition to the model suggested by the designer some are taken from magazines and also from other products – not necessarily handmade – acquired in trade shows.

Regarding the limitations of the artisans some difficulties were perceived: the lack of knowledge on the topics creativity and innovation; the difficulty in relating the words of the dynamics with the subject presented to them for the creation of new products; shyness in exposing their opinion believing they are being assessed rather than helped.

4.2. Technique building process

In order to describe how the process of construction of the technique occurred Figure 3 presents the evolution of the number of applications in time being composed of two levels – academic and business – each one with three activities (Intervention Analysis and Improvement).

4.3. Step 0: initial design

After the analyses of interventions in communities brainstorming sessions were held with the members of the UFRN's research group in order to develop a simple use technique that presented unobserved characteristics in the techniques applied to the object of study – artisans' communities. Thus we have come to some conclusions: (i) the technique should focus on informal conversations

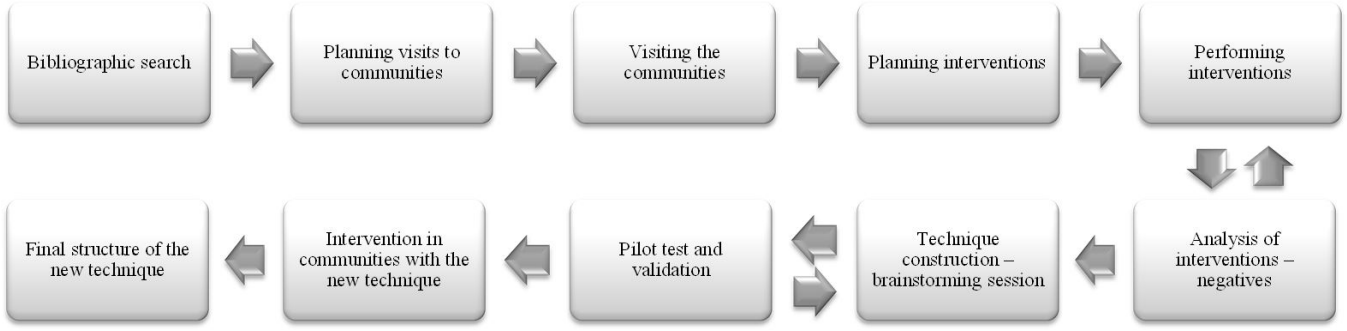

Figure 1. Phases of the research method.

Figure 2. Products manufactured by the communities which are objects of study.

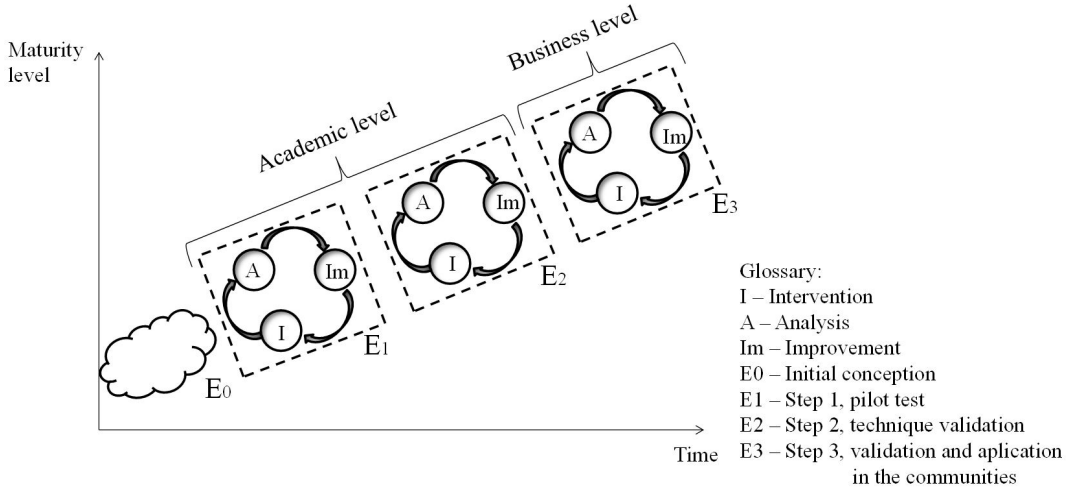

Figure 3. Evolution of interventions in time.

among the artisans; (ii) it would be necessary to contextualize the topic creativity to the artisans; (iii) the generation of ideas would be better understood with the presentation of a subject to be developed; (iv) it would not be necessary to fulfill a table matrix etc.; (v) artisans would neither need to read nor to write during the application of the technique.

Thus taking into consideration all the points highlighted above it was concluded that the technique could be based on a children's game in which they are asked to say the first word that comes to mind and that is related with the word spoken immediately before the turn. Therefore it would be a form of informal conversation without the need to read write or fill any type of table; besides it is a fun way to create.

In order to reach the final result – ideas for new products – adaptations to the game were necessary. The initial word wouldn't be said according to the facilitator's will but it would be randomly drawn from a prior list of words; in order to introduce the artisans in the context of creativity videos should be shown; at the end of rounds of words all words spoken would be compared to the subject in order to allow only those words which had some sort of relationship with the subject to remain for the generation of ideas; after the phase of generation of ideas they would be presented to the group whether written drawn or spoken – left to the discretion of the artisan.

At the end of these adaptations a script was created with seven steps for the application of the technique. Then the first intervention took place within the research group itself (Stage 1).

4.4. Stage 1: pilot test

After all the technique's steps have been determined the technique was applied in the research group as a pilot test (E_1) within the context of a dynamics. In this application the technique followed these steps:

1. Presentation of the technique and the subject being discussed;
2. Video presentations on creativity and innovation including examples.
3. Draw the opening words;
4. Round of words;
5. Selection of words that are related to the subject according to the participants' point of view;
6. Generation of ideas;
7. Presentation of the generated ideas by the participants.

Nine people attended this test; they were arranged in a circle so that the dynamics could be better developed. The subject selected for the pilot test was practicality in everyday life for college students. The choice of videos was made based on the profile of participants: high level of education affinity with the themes: creativity and innovation. Two people were assigned to type the words considering the speed of response expected from the participants besides this being a facilitator for the dynamics. After ten rounds we obtained a total of 100 words for the subsequent selection of those that are related to the subject.

After about 25 minutes three ideas emerged: (i) the development of glasses that would allow students to attend classes in real time from wherever they are and this video would be automatically inserted into the virtual portal of

the given school subject; (ii) a system that would allow to recharge the bus ticket cards directly from personal credit/debit cards eliminating the queues at tickets recharge points for municipal transport; and (iii) a capsule that would contain various vitamins and nutrients providing power and nutrition to the student for a certain period of time.

After applying the dynamics an analysis of the results and the participants' behaviors during the application was performed. The main problem identified in this pilot test was the subject's scope extension which hindered the consensus in selecting words and even the generation of ideas.

As an improvement to step 2 the subject's presentation has been discontinued at the beginning of the technique and was performed only at the time of the selection of words since it wielded influence over the rounds of words and was making it very limited the resources to generate ideas; along with it the explanation of the dynamics began to be done in stages: first a brief explanation is made and before each step it is explained how it occurs. Presenting videos also suffered changes as the video on innovation was shown after the technique's presentation and the videos with innovation examples were shown before the ideas generation.

4.5. Step 2: technique validation

With all the changes performed in Step 1 the dynamics was applied with Production Engineering undergraduate students at the Federal University of Rio Grande do Norte in the subject named Product Engineering for the validation of its new configuration (E_2).

In order to perform the dynamics (application of the technique) four groups were created each one with nine participants held in two days. For the first two groups the topic remained the same – practicality in everyday life for college students – in order to assess whether there would also be difficulties in performing the following steps of the dynamics. As the topic continued hindering the selection of words to generate ideas more specific subjects were set for the latter two groups: practicality in everyday life for college students regarding transportation; and practicality in everyday life for college students regarding alimentation respectively. Thus the technique began to be performed in 12 steps.

1. Technique's presentation;
2. Video presentation on creativity and innovation;
3. Explanation regarding the round of words;
4. Draw the opening words;
5. Round of words;
6. Presentation of video with creative ideas examples;
7. Explanation on lateral thought;
8. Explanation of the election of words;
9. Presentation of the proposed subject;
10. Selection of words that are related to the subject according to the participants point of view;
11. Generation of ideas;
12. Presentation of the generated ideas.

The results obtained with these applications were satisfactory being generated in each group around four ideas for new products. Some of these are: A Wi-Fi socket to charge wireless equipment letting the outlets free; machine programmed for meals – students can make their weekly menu for example; auto service snack machine for Açaí; mug with thermal control; flag showing vacant study spaces inside libraries; shoe with removable parts clients would make their shoes according to their convenience; smart bag with a measures indicator etc.

Once the changes regarding the technique's application were validated the next step of the intervention was the validation with the object of research and its application in loco E_3 which occurred in two interventions in the communities of Lajes Pintada and Massaranduba.

4.6. Stage 3: application in the communities

The steps were the same as in Step 2 but a blockade in the generation of ideas was observed because after the subject was presented – Saint John's Day – the artisans could not produce unless the problem situations were presented to them. We came to that conclusion because of how the artisans' creative potential is required by SEBRAE since the model to be produced is presented "ready" to them. Even with this creative impasse in the community of Lajes Pintada six new ideas were generated: ties made of sisal to be used during Saint John's quadrille dance; a small unisex shoulder bag for whoever participates in the June festivities; decorative flags; a device to hold the corn on the cob preventing the person from burning while eating corn; barbecue plates with dividers for farofa and vinaigrette; a set of tie hat and belt printed with the selected theme.

For the next intervention that occurred in Massaranduba it was decided not to present problem situations at first in order to compare the generation of ideas between communities. The theme was maintained the same – Saint John's Day. As expected it was necessary to present problem situations in order to facilitate the generation of ideas. Several ideas were generated but the words related to the topic were not used in an interconnected way but individually. As examples we may cite: a shoulder bag to store both documents and a glass and/or a bottle; a decorative mat; St. John's clothing – skirt and vest; crown of Corn Queen/King; containers made with carnauba to serve traditional food.

By analyzing the Stage 3 of the interventions it was necessary to add to the technique's twelve steps the

presentation of problem situations and the need to list the selected words and then go to the step of generation of ideas in order to facilitate it remembering that this step is conditioned to the group's time of response faced with the application of the dynamics.

5. Description of the CREATION technique

This new technique (Figure 4) CREATION – Clarify and explicit the context of the development Relate about creativity and innovation Explain the generation of words and elements Apply and communicate the first word Think fast the next words Interpret and choose the words Organize the words to construct ideas Now expose the ideas – aims to stimulate the generation of ideas for creating new products collectively. It is recommended to be applied by a dynamic composed of three stages: Planning Implementation and Analysis.

The first stage is the planning of the dynamics that shall cover six activities: (i) identification of participants (product users or developers); (ii) quantification and selection of facilitators and their assistants; (iii) selection of words to random sampling; (iv) definition of the topic being discussed for the generation of ideas for new products; (v) selection of videos about creativity to be shown as well as other required materials; and (vi) discussion about the dynamics operationalization.

Still in the planning stage situations in which the creative performance is not present among the participants it is necessary to describe problem situations in order to encourage the generation of ideas in its respective step (activity 4).

Figure 4. CREATION technique.

The second stage which is the technique's application presents twelve activities. Showing its main goal and the steps to be performed during its development an introduction about the creativity technique (C – Clarify and explicit the context of the development) must be initially done.

Then we present a video about creativity followed by a short explanation about what the video presents so that participants can inspire themselves for the creative session (R – Relate about creativity and innovation). After that the facilitator shall organize the participant group in a big circle and explain the generation of words by the group (E – Explain the generation of words and elements).

Then the assistant shall randomly select a word that will be the starting point for the round of words (A – Apply and communicate the first word). Later the word round begins. The randomly drawn word will be reference to the dynamics facilitator who will say the first word that comes to mind when he hears the selected term. Following an order pre-established by the facilitator the following participant will keep saying the first word that comes to mind when hearing that word said by the facilitator (T – Think fast the next words) and so on until we have a significant number of words (between 30 and 40) remembering that repetition of words is not allowed.

Once this activity is completed the second video is shown presenting examples of products developed from unconventional ideas in order to enhance the importance of lateral thinking and to show participants that innovation can be something simple and can be done by them. The closer the examples are from their reality the better the effect is.

The next activity is to expose the subject. From this point all the words spoken during the rounds shall be available for participants so that they choose those that are related to the proposed theme (I – Interpret and choose the words).

Then the chosen words are highlighted for better visualization of the participants and we set a time of 20 minutes for building ideas so that participants can think divergently relate the selected words and generate new product ideas; it is possible to give an extra time or reduce the time available according to the generation of ideas flow (O – Organize the words to construct ideas). Depending on the creative performance of participants we present problem situations in order to facilitate the generation of ideas. So participants can express their thoughts stationery is distributed to them – paper and pencil – so the individuals belonging to the group can register their ideas more conveniently. At this time the participants do not necessarily need to write the generated ideas; they can be expressed through drawings or just by talking so it is the assistants' responsibility to take note and register the ideas. After the generation of ideas one or more participants are invited to submit their creations (N – Now expose the ideas).

The final stage analysis consists of registering all ideas for new products followed by a reflection on their concretization. At this stage it is important not to judge the generated ideas even if they are incoherent because after being discussed and improved these ideas can result in a marketable and profitable product. Two facts also occur in this phase: feedback to the group participating in the technique and a critical analysis of the technique and the dynamics performed.

6. Final thoughts and recommendations

6.1. Guidelines for the use of the technique

The guidelines for the implementation of the technique start with the selection of resources to be used. The necessary resources are: computers overhead projector photo and video camera note pads pens and pencils blank sheets videos to be presented and words to be drawn. These words can be placed into a box to be drawn randomly or may be listed on the computer and with software assistance such as Microsoft Excel for example they are selected.

The selection of videos and words is conditioned upon the participating group's level of education and the videos shall be clear direct and short not to tire the participants. It is interesting one video to be more didactic covering concepts about creativity and product innovation; and other video to be practical with examples of creative products. Regarding the list of words this shall cover various semantic fields and be sizeable – for interventions it was used a list containing 100 different words. It is necessary to adapt the words to the participant group's reality because it is not interesting to present terms that are not common to their daily routines.

Regarding the group's extension the ideal is a minimum of four and maximum of nine participants. Each participant can think of a word in the shortest time possible. During the rounds of words the facilitator shall not only participate in it but must also make his assistants to understand the words that had been spoken as well as encourage the progress of rounds with questions about what the word represents. However this should only be done when the participant shows some discomfort and/or confusion in relation with the previous word. Still the facilitator shall have this attitude in the most discreet way possible not to influence the rounds.

After the selection of words related to the theme and depending on the creative performance of participants the presented problem situations shall be the most possible superficial as possible so the ideas to be generated are not affected and also so that the participants are provoked to develop their creative potential.

The technique can be applied by others in a particular group or within the same group following the steps listed in the previous session. As it has arisen from a children's game the technique is simple light and does not require much knowledge of the participants not being restricted to intellectual groups.

Any environment can be suitable for the technique's application. However the ideal is it to be applied in an environment without noise interference which is comfortable and easy to be accessed by participants.

Planning organization and attitude are recommended to the staff who will apply the technique in order to ensure the credibility and flow of the dynamics and also to correctly answer possible questions.

6.2. Considerations and limitations

Especially with the change in its classification handicraft has incorporated new tools and materials to their manufacturing process which may characterize an increase in job opportunities and products developed. However unlike what occurred in the past artisans who received education are "plastered" in ready modular and standardized models retracting their creative ability making them dependent on others.

The creativity techniques can contribute to the process of generating ideas for new craft products while rescuing this creativity from artisans giving them creative autonomy facilitating the search for new ideas new products and new solutions.

Thus the CREATION technique presents itself as the most suitable collective technique to develop skills in generating ideas for new products in the artisans' communities since it was designed to meet an audience with low level of education. Although preliminary tests have been conducted with undergraduate students holders of a higher level of education it can be considered that the proposed technique is relevant considering its scope into several groups which does not occur with other techniques described in the literature for this same purpose; in addition to promoting constructive convergence and active participation of all involved participants in a playful way.

By having a concept based on a children's game the technique proposed here is not restricted to only a specific group. Confronted with the forced morphological connection technique the CREATION technique does not use matrices or diagrams to explain the generated ideas which would be a limitation for individuals with low level of education.

Another relevant factor is that CREATION is a technique already described in association with a dynamics for its application as it was observed during the systematic literature review on creativity techniques that literature only presents the techniques and their descriptions letting their operationalization free which can lead to unsatisfactory results with the technique's application.

The main results achieve with this research were: i) Introduction of a technique to generate ideas – CREATION

technique – collective creativity of simple understanding and application; ii) The technique aims to generate ideas collectively; iii) the opportunity of giving responsibility and empowering people especially the artisans during the creative process of their products; iv) definition of the technique's script of application also providing examples; v) its applicability in different situations; vi) the technique works best when there is multidisciplinary expertise and personalities in the group for example where the four characters of the creative process prevail as presented by von Oech (1994).

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