Product Design and Manufacturing

Prof. J. Ramkumar
Department of Mechanical Engineering & Design Program
Indian Institute of Technology, Kanpur
Dr. Amandeep Singh Oberoi
Department of Industrial and Production Engineering
National Institute of Technology, Jalandhar

Lecture – 23b
Creativity techniques (Part 1 of 2)

Welcome to the next lecture on Creativity techniques. Creativity is something which is amazing; see sometimes you, I would like to just narrate an example, what happened in our house. I have a son, who is in standard-8, so, the day he was trying to get ready for the school. He realized that, he did not have a white shirt; which is his uniform, so the time has come he has to leave the house for the school, then he realized the uniform is not there.

Since, the uniform is not there without uniform if he goes, he will get blasted in the school. The other way round is he can wear a color shirt, which he has already used this card of using color shirt in the school once or twice this academic year. So, he knows that if he does it, he will be blasted. So, the boy went and picked a shirt, which he had, which is not his uniform, which had two white arms, which is attached to the shirt. And the shirt had a white collar and then the shirt in between had some embroidery things. So, quickly this boy went, and took up the shirt and wore a sweater on top of it.

So, when you look at it from outside, it looks like he is wearing a white shirt, but maybe because of cold, the boy is wearing a sweater, so that he can get so he is comfortable. So, wearing this he escaped out of getting trapped in the school without his proper uniform. One way, I do admit he has not planned properly, but the other way you look how creatively he brought a solution to it.

So, creativity is something amazing. And many a times creativity is done, when you push somebody to a corner and start asking him to think for a problem solution many a times. If you look at even the safety pin, it got developed because a person was sitting there with hunger and he was not having money to protect himself and his family. So, he went on meddling with a wire and then he came up with a safety pin or a safety clip. So, creativity is something which is very, very amazing. So, this lecture will be more focused towards creativity techniques.

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So, what are we going to cover, we will have a small introduction. Then, we will have the creative processes, then what are the different blocks of creativity, then factors conducive to creativity and creativity techniques and creativity ability versus age. And here, you see conducive, this is very, very important. If something has to happen, you should have a conducive environment for that happening to go ahead; conducive.

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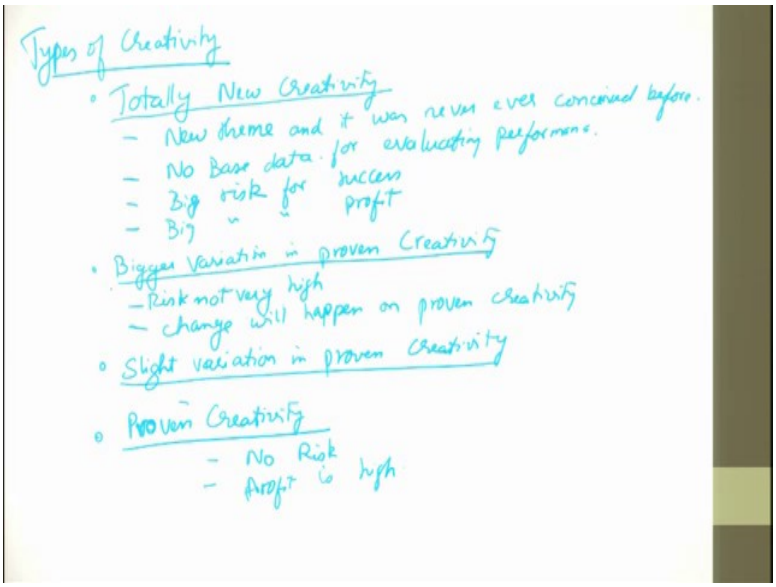

First let us see, the different types of creativity. So, first type is called as totally new creativity. So, it is completely a new theme and it was never ever conceived before. So, there is no base data for evaluating performance. And, it has a big risk for success. And I will say a big risk for profit also. This is completely new creativity.

For example, Ola and Uber which came; it was completely new. The Amazon, when it started, it was completely new. And then so many things like: online shopping of traditional Indian products completely new, when it started first time. But, now slowly if one person is there, so then the other joins; the other joins, so that is how it is going. So, this is one type of creativity.

The next one is bigger variation in proven creativity. So, here what happens is; so the risk is not very high. This we already knew that, there is a creativity which is been proved and a small variation. For example, today we talk about online hotel booking, right. Then we talk about online now people talk about online tea delivery; *chai* delivery ok. So, now what we are trying to talk is can we integrate Ola and Uber service along with the *chaiwala* or with the food service providing *wala*, so that you can try to get your food at you are table within half an hour hot spicy; whatever it is.

So, the business of Ola is very well known, the business of tea or whatever it is known, now we are integrating this two. So, there is a bigger variation integrating this two, for a proven creativity, this is what it is here the risk is very low. And, the change will happen on proven creativity; this is second variation

The third variation will be slight variation in proven creativity. And here, the other thing is then bigger variation, it is like something which is very well known for a biologist is not known to a mechanical engineer. So, mechanical engineer has his expertise, biologist has an expertise, biologist expertise is whatever he develops is proved success, mechanical engineer proved success. So, now what we do is we blend these two, and have a variation between this and that, but you are pretty sure that there is going to be a success that is; what it is.

Then it is slight variation in the proven creativity is, ok. The online website is created, this online website is proven very good for selling books, now selling cinemas, cinema tickets, selling food products, selling textile products. So, these are all slight variation to the proven creativity is the next category. So here, the all the other risk factors, you can put a table and

then you can try to take it in the column wise, you see that no database available some more database available big risk not, so big risk. So, you can have that variation.

And the last one is going to be proven creativity. So, proven creativity is; there is no risk at all; ok, and the profit is high. I now, if I do some small creativity, during the time of Diwali in the terms of textile cloths, I am sure that I will succeed. So, basically the creativity is divided into 4 categories totally new, then it is something which is bigger variation for in proven technology, then you can have slight variation in the proven creativity, and then you can have proven creativity. So, these are the 4 classifications, you can have in terms of creativity.

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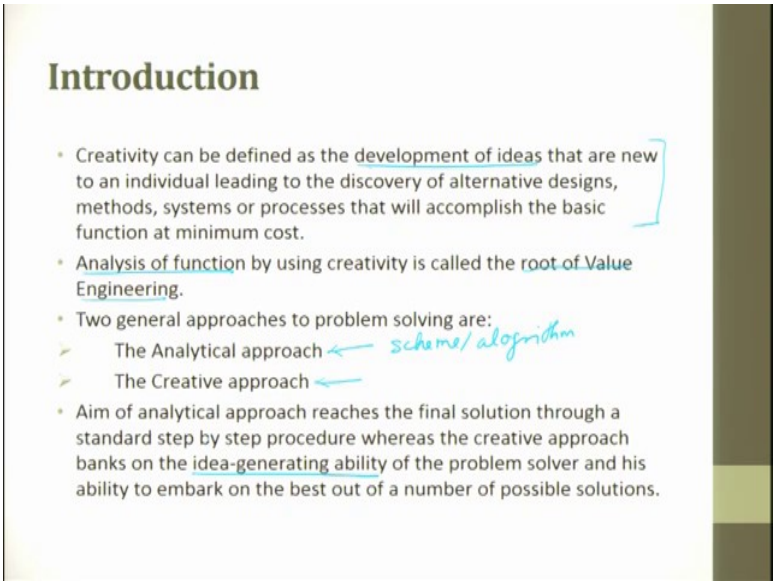

So, now let us see, what is creativity? So, creativity can be defined as a development of an idea that are new to an individual leading to the discovery of alternative designs, methods, systems, processes, that will accomplish the basic function at minimum cost. If you go back, and remember the example of my son whatever I gave it is, it fits in here. Creativity can be defined as a development of an idea, so he had to develop an idea, that means to the he has to wear a white shirt and go to the school.

So, development of the idea that are new to an individual leading to the discovery of an alternative designs, he chose an alternative way of wearing the same white shirt and going to the school. So, creativity comes there. Analysis of function by using creativity is called as the root of value engineering; analysis of function right.

Two general purposes to problem solving are analytical approach, the other one is creative approach. Analytical approach is: you have a sequence ready, you have a logical sequence ready, you just plug in values there. And then suppose for example, if I want to carry in a bag some 10 kilos of item, and then now I want to try to use the same bag and carry 50 kilos; it is not possible.

So, now I know where all have to be strengthen, what all has to be done, so that I can do it, so that is called as an analytical approach. Aims of analytical approach reaches the final solution through a standard step by step procedure, whereas creative approach, banks on the idea-generating ability of the problem solver and his ability to embark on the best out of a number of possible solutions is creative approach.

Analytical approach: the scheme/algorithm is known and the problem is solved. The only thing is I change the variable, I change some parameters make the variation and try to meet out to the new requirements. So, those are analytical approaches and then creative approach is creating new ideas and generating it.

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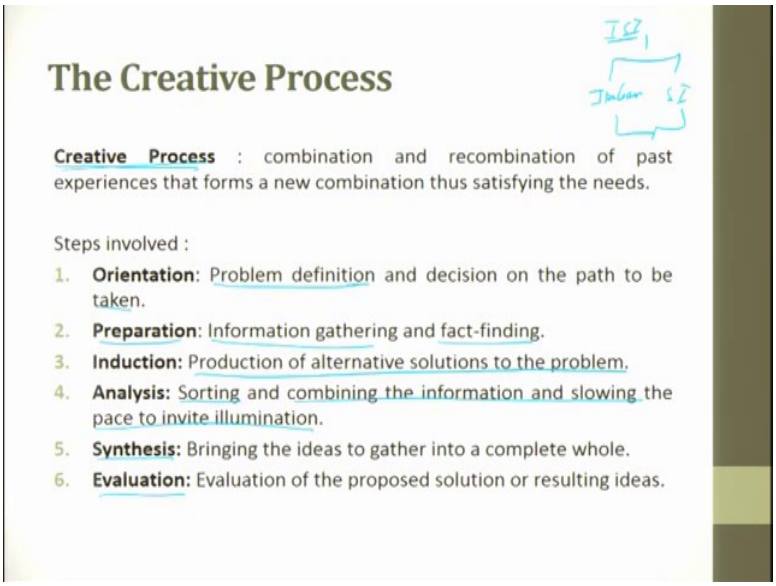

So, creative process as a combination and a recombination of past experience that forms a new combination thus satisfying the need. So, let me tell you another interesting example, when I visited Delhi, I saw a board. In that board, it was written Italian idly. So, idly is a South Indian dish, Italian a South Indian dish could never have been travelled to Italy. And an

Italian dish; whatever it is the Italians would have not traveled to south, so that they form a combination.

But, what people have understood is Italians taste of pasta and other things they know, the shopkeeper knows very well there will be an audience for it. And there were audience for a south Indian idly. So, he blended these two and he made a huge profit, so that is creative process. Combination and recombination of past experience, past experiences is he know Italian food has a huge success, then South Indian food has a huge success. So, he blended these two and came out with a new thing called as Italian South Indian idly or whatever it is; right.

So, the steps involved in creativity is first is orientation. Orientation is the problem definition and decision on the path to be taken is to be first decided. So, for example, if somebody comes to me and ask, what would you like to be after 10 years? Can you plan your life for the next 10 years, sorry I do not know. Can you as a customer, plan your life for the next 10 years? Sorry you do not know. So, if the problem definition is not very clear, then you are not going to solve the problem, so problem definition is very, very important. Problem definition and decision on the path to be taken is very, very important.

Next is preparation. How do you gets the information for this particular problem to be solved. So, information gathering and facts finding is the other thing, which will help you to solve a problem. For example, if you are looking at India, in India the biggest problem is drinking water, come summer water is a scarcity. So, you have lot of spurious water which is getting sold.

So, now the biggest thing is like how do I make sure that this does not happen. So, then what I will do is, I would now look for the easiest way of killing this business is reduce the cost per bottle or a liter of water reduce the cost to a very, very low margin like a liter is three rupees, a liter is 2 rupees, then naturally not many spurious players will be there in the business; ok? so because of the profit margins and the other things are less. So, there will not be many players.

So, now what is happening is you have to collect those information, where all there is water scarcity, where all you can sell, how all you can sell. If a bottle is used can a branding or rebranding can it be done or can a unhygienic water or a disinfected water is it been filled.

So, all those things, you are supposed to find out. Information gathering and facts-finding, where all the spurious things can happen so, all these things are there.

Next is induction; a production of alternative solutions to the problem. See when you start solving a problem ok, you have identified there is a problem and then you are trying to solve the problem. So, when you try to solve the problem; information's have collected, now you put the first conceptual idea. Many experts or creative thinkers, they say: the first idea will be your passionate idea please throw that idea out. So, the next idea what you start generating will be little more realistic.

So, the first idea whatever comes to your mind and when you start developing it that will be a fascinated idea that will be fully your thoughts. So, they say throw away that idea. So, for throwing away that idea, what is the other thing they have to generate multiple solutions to the same problem. Then, once you have 20 number of solutions, it's like you have a you are hungry you go to a hotel in a menu card you see lot of items. Now, what you do is you try to decide what is your mood, then who is there with you, then you will see how much hungry you are, what is the taste you want to have on that day, then you pick those items in your menu card, so you order.

So, in the same way; when you try to a have alternative solutions you are supposed to pick things and start doing it. So, analysis is sorting out and combination of information and slowing the pace of invite illuminations are done, so that what happens you try to solve; pick the solutions. Or you when you pick the solutions, you can also try to have in a menu card you picks one *sabji*, you pick one *chapathi* item or whatever it is. So, you pick depending upon the choice also you decide your menu; that is also possible.

So, sorting out and combination of information and slowing the pace to invite illuminations are the done by analysis. Then you start doing synthesis, bring these ideas together into a complete whole and then evaluate the ideas, so that is how you start generating ideas and all these things are part of the creative process.

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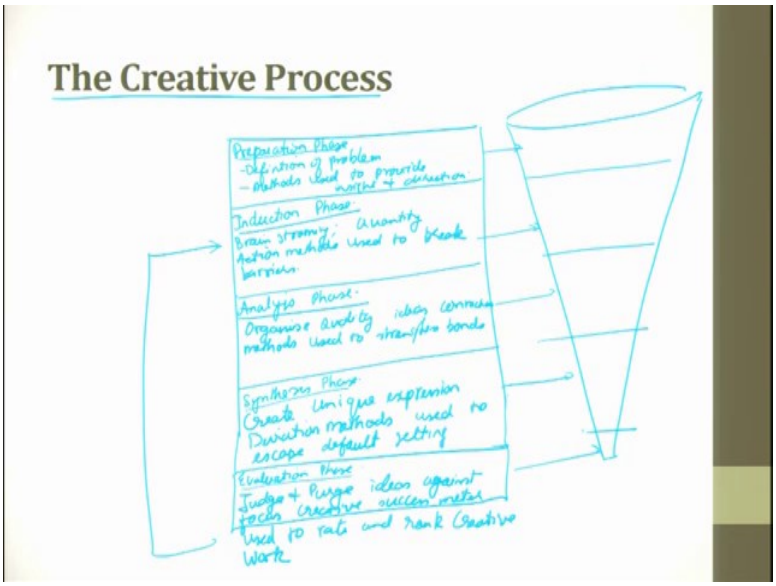

So, let us see in the creative process. So, have four phases. So, first one is called as a preparation phase, then you will have induction phase, then you will have analysis phase, then you will have synthesis phase and the last one you will have the evaluation phase. If I wanted to express it in a pictorial manner, so you should have something like a funnel and you can divide this. And, whatever comes out will be as part of the evaluation phase, right? In the preparation phase, what will happen, you will have this is so corresponding to this.

So, you should have more number of ideas, ideas go down, ideas go down and down, ok? Preparation phase is a phase, where the definition of the problem and then methods used to provide insight and direction that is in the preparation phase. Induction phase is nothing but brain storming phase, then you have quantity and action methods used to break barriers. So, in the induction phase, you do lot of brain storming and in the analysis phase, what you do is you organize quality, ideas, connection methods used to strengthen bonds.

So, you try to see the connection. So, here it is basically you have developed so many ideas, then you will try to develop these ideas and the connections you see then synthesis will be you are trying to create unique expression to solve the problem. Then, deviation methods used to escape default setting. And then in the evaluation phase; you judge and purge ideas against focus, creative success, meters used to rate and rank create to work, ok. So, these are the phases. So, preparation phase, induction phase, identify the problem, brain storm sessions, organize your thought, synthesize your thought and evaluate your thought.

So, these are the different phases and finally, what you get out is the in the evaluation phase. And by the way, after the evaluation phase again, it goes to the induction phase. After solving the problem if you have some lacunose, you go back and try to do several of the induction phases, several of the other brainstorming sessions to solve the problem.

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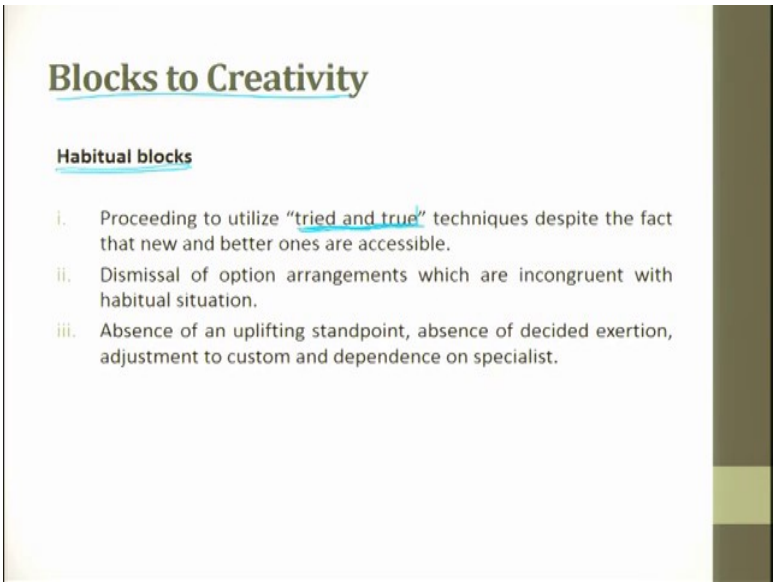

So, there are several blocks to creativity: one is the habitual block. Habitual block is I do not like chemistry, whatever set and done, so good a teacher, so good a illustrative book so much of video available, I do not like chemistry; I do not like chemistry. What is that, that is a habitual block, right. So, and the other thing is whenever I go to temple, I always try to go via certain other temples and then only go to the main deity temple, so that is a habitual; right, so many things habitual is something which is very, very prone.

So, without doing certain things I will not get out of the house, fine? that is habitual block. Whatever may be the time crisis I will do that. So, proceeding to utilize tried and truth technique despite the fact that new and better ones are assessable, ok. Dismissal of option arrangements which are incongruent with the habitual situation is the other thing. Absence of uplifting standpoints, absence of decided exertion, adjustment to customize, custom and dependency on specialty. So, all these things leads to habitual blocks. So, these are a block which will not allow you to go towards creativity.

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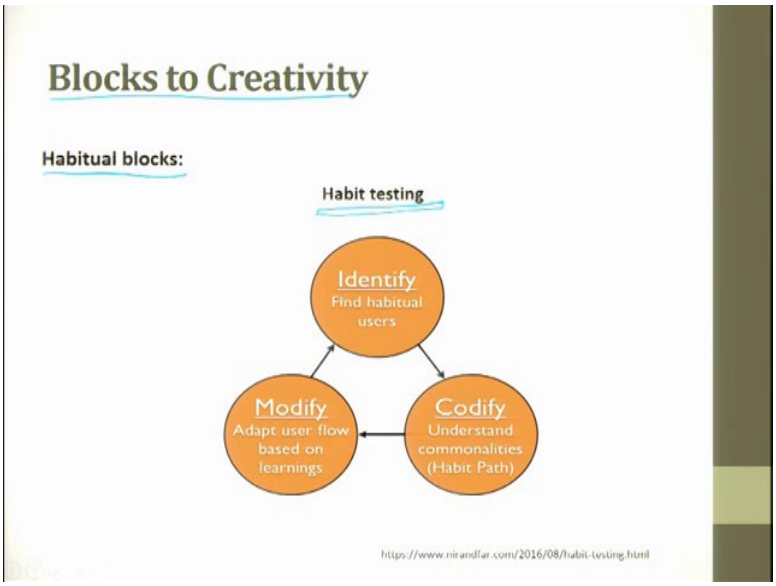

So, habitual block, if you see, habitat testing identifying, find habitual user, then you try to codify, codify is understanding commonality, habit path, and then you will have modify, adapt user flow based on learning, so, you keep doing it. So, this is the habitat test. So, in block of creativity habitual blocks, you have the habitat test; which is conducted. So, where in which we do identify, we codify and then we modify and try to keep going in the circle to find out what is the to see how to improvise your creativity.

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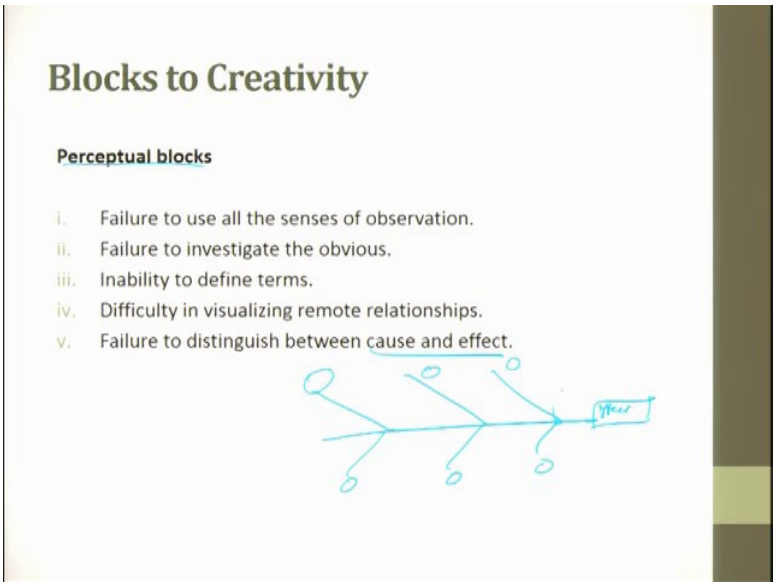

Perceptual block is failures to use all the sense of observation, failure to investigate the obvious, inability to define terms and then difficulty in visualizing remote relationship, failure to distinguish between cause and the effect. so we you when we do the fishbone diagram, so fishbone diagram these are the cause and this is the effect. So, if we do not know to distinguish what are the causes and what is the effect of it, so then it is very difficult.

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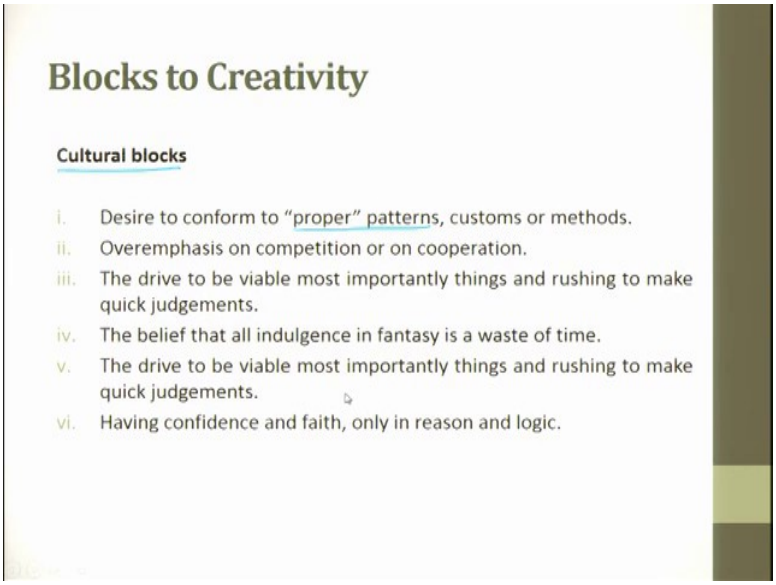

Cultural block, desire to conform to proper patterns customs or methods so, this is a cultural block. So, first we saw habitual block, then we saw perceptual block, then here now we are seeing a cultural block. Over emphasis on competition or non or on cooperation. The drive to be viable most importantly thinking and rushing to make quick decisions; this is a cultural block. The belief that all indulgence in fantasy is a waste of time; cultural block. The drive to be viable most importantly things and rushing to make quick decisions. Having confidence and faith only in reasons and logic; this is a cultural block.

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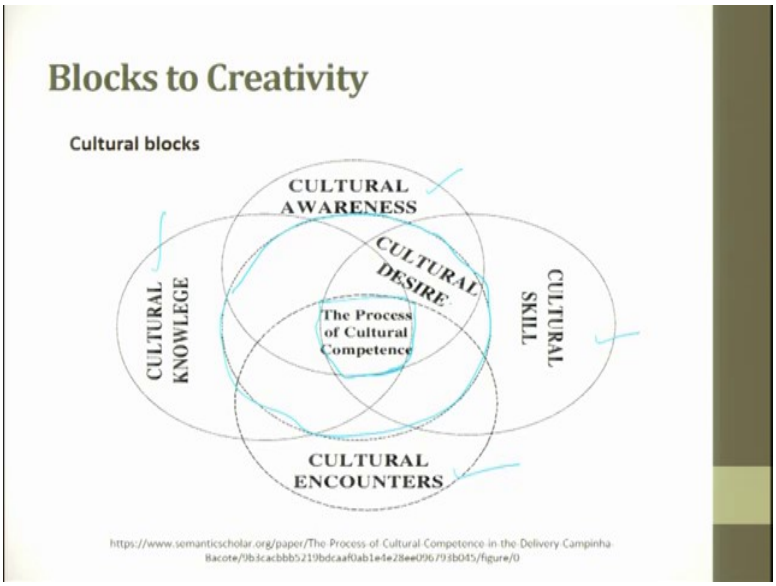

So, blocks of creativity, you have cultural block, this is cultural awareness, this is cultural skill, this is cultural encounters, this is cultural knowledge and this is cultural desire, which falls a common, which is a common thing, which forms you see this circle, which talks about cultural desire, ok. Then the integration of or a common area for all these things is the process of cultural competence; which is there.

So, cultural awareness and cultural skill, these are some things which and then in a country like India, where there is a vast multicultural existence. So, cultural skills are completely different, cultural encounters, then cultural knowledge, why do we do this, why do we do that festival; that is knowledge, ok. Cultural awareness is very, very important.

Because, today we talk about understanding the roots, so cultural awareness; right, cultural skills, what are our exceptional skills, how did we come into existence, what are we supposed to do and all those things are cultural skills. Cultural desire is an is also a new thing, which is coming up and the last one is cultural encounter. So, these are certain cultural blocks, which are existing today. So, if you want to get into creativity, you have to get out of all these blocks and go towards creativity.

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Emotional block; emotional block is fear. Whenever I touch something new, it breaks. Whenever I do something, it breaks. Whenever I try to go on a Saturday, it fails; something like that, so it is all emotional; right. Fear of making mistakes or appearing foolish. If I do that, I will fail. So, I have many people do not even open out their mouth, recently was doing, I was having a get together with school students. So, these school students were all had a language barrier, they were not, they were very finding it very difficult to come out and speak in English.

So, what I did was I asked them which game do you like, and then they said cricket. So, then what I did was, I played for 1 hour a cricket match on a screen, and asked the students to give a commentary for it. So, first they start and then I told them you talk whatever you want and you give commentary, whatever you want in whichever language you want.

So, first what I did was, I took them out of their mental barrier and emotional block, they started opening, and then they started talking. They started giving commentary about the match, what they see on the screen in their own vernacular language. Then, I asked them to give in a proper sequence, in a proper manner, in their own vernacular language, on the next day the same cricket match; what they did yesterday.

So, they were much more confident, the scene was known, so they started giving. So, it was something like a dubbing which they did. And on the 3rd day, I said now you should talk in

English. So, slowly they came out and they started talking in English with lot of mistakes; grammatical mistakes. And I repeated this exercise for one week and on the 5th day and 6th day believe me, they started speaking in English and they started giving the commentary without any mistakes; grammatical mistakes. So, they have improved.

So, all that I did is I broke their emotional block. So, fear for making a mistake or appearing foolish. Fear of supervisor or colleagues and subordinates distrust. Over motivation to succeed quickly. Refusal to take any reroute in achieving an objective. Failure to dismiss choice which are satisfactory, yet which are clearly sub idea. So, these are the emotional blocks which you have to kill it, so that you have a creative thinking. So, when you see the emotional block, it is like the situation selection, then you have attentional deployment, then cognitive change and then response modular.

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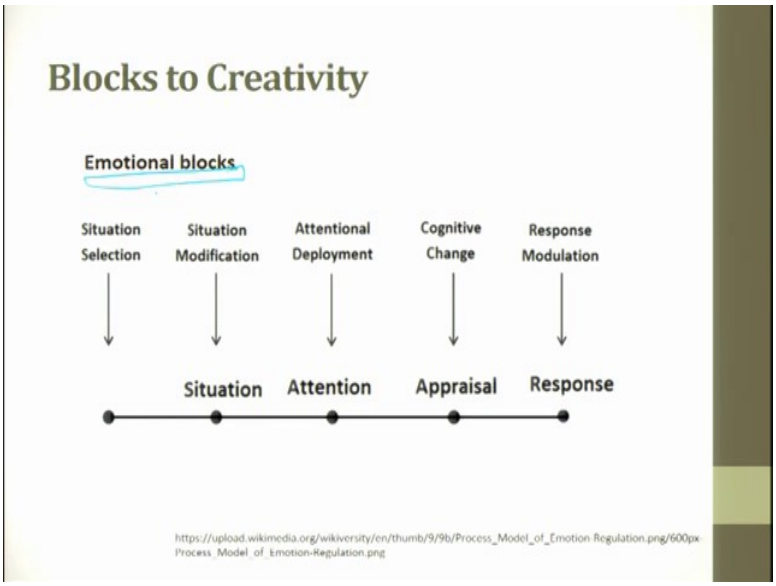

So, if you see their situation, attention; ok and then you have appraisal and then you have response, so you should make sure all these things get out and you get out of the emotional block, so that you can produce.

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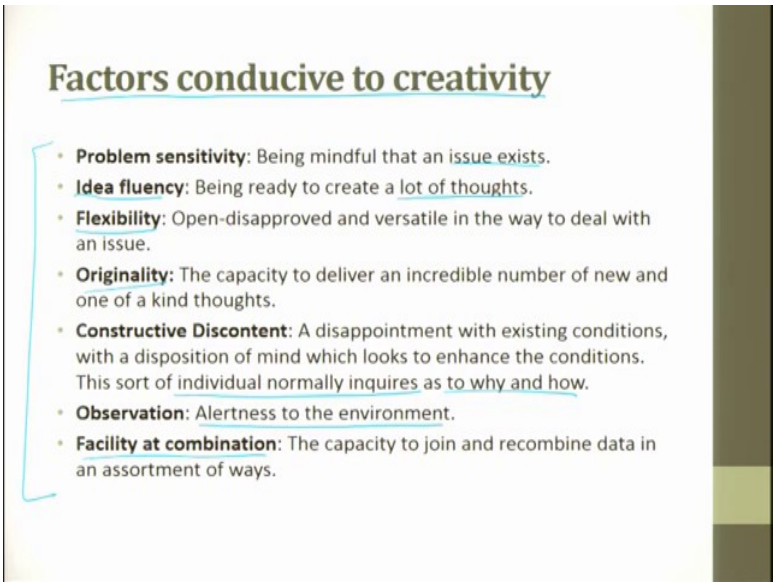

So, the factor conducive for creativity is problem sensitive, being mindful that an issue exists; that is problem sensitivity. So, when you try to solve a problem, you should be mindful that there is a problem. If there is not a problem existing, please do not solve the problem. If things can happen without solving the problem, then do not consider that as a problem. And if you have a problem, be sensitive to the problem. For example, wearing a perfect dress for an occasion. So, you should think that yes there is a problem which we have to address and there are solutions; we have to look for solutions.

Then idea fluency, being ready to create a lot of thoughts. So, you are suppose to come with lot of creative ideas, lot of thoughts. And suppose, you say that I have 25 ideas you lay it down. And maybe all among the 25 ideas, 10 ideas may be foolish, but still put 4 those ideas. So, then when you start killing those ideas, something might be interesting there we pick it up and then take it to the main solution; whatever you have later.

Then we should have flexibility. These are some of the conducive environment, you should have. Flexibility: open-disapproved and versatile in the way to deal with an issue, you should always be human. So, you should always try to understand others, accept others, have no emotions and when there is a challenge thrown on front of you on your idea, you should be in a position to justify that idea and go towards the betterment.

And originality, the capacity to deliver an incredible number of new and one of a kind thought is originality should be there. Originality also induces creativity, lot of musicians bring in originality in their music, artists bring originality. In the same way technologists also bring in lot of new originalities in their thing.

Then constructive discontent; a disappointment with existing conditions with a disposition of mind, which looks to enhance the conditions. This sort of individual normal inquiries are to why and how are to be constructor. Then it is going to be observation; observation is alertness to the environment, it should be there. And facilities to at combination, the capacity to join and recombine data in an assorted way, it is also important.

So, these are some of the factors, which are very important, which helps to conducive in making creativity. Problem sensitive, idea of fluency, then flexibility, originality and constructive discontent, observational, and facility at combination are some of the factors which are very important, which tries to bring in creativity.

These are the conducive factors, these factors will lead to creativity. So, you should have be sensitive, you should be idea fluency, you should be flexible, you should be original, you should have constructive discontent, so you should not feel disappointed with the existing, you should start moving forward, then observations, then facilities at combination.

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Orientation is very important, motivation, and permissible atmosphere. So, orientation is developed to the best possible attitude towards imagination, you should have a orientation in solving problem. Then the next one is motivation. The summoning of the essential vital to work towards an objective and accomplishing it is the motivation.

You do not you should have a motivation factor. If your motivation factor is lost, then your creativity will not happen. Motivation is something very, very important, that is why if you see in many of the colleges and schools, they have somebody called as motivators, motivators are nothing but counselors, so they try to motivate people.

Counseling does not mean only psychological counseling, there are other counseling's also required. So, motivator, so motivation is one. And permissible atmosphere and environment in which new thoughts are empowered is permissible atmosphere you have to create. So, all these things are factors, which are conducive to creativity.

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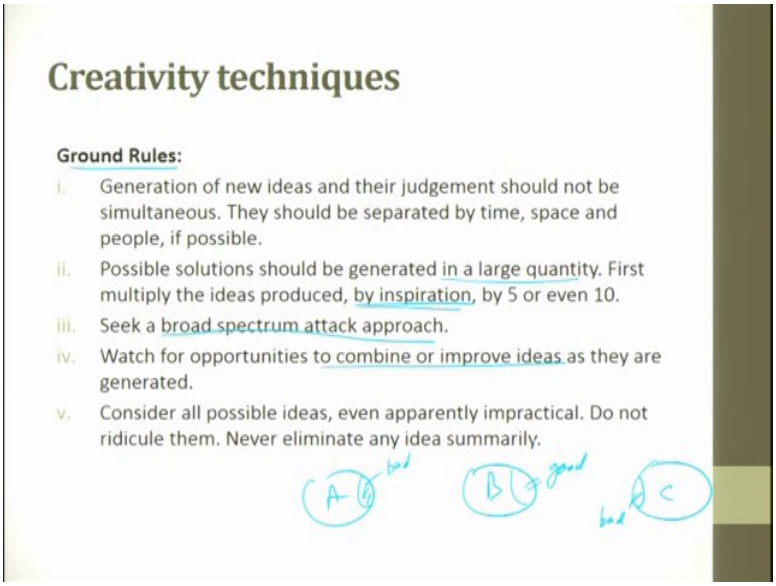

So, creative techniques, first is ground rules: generation of new ideas and their judgment should not be simultaneous. Make an idea and immediately, you should this idea is rubbish, drop it; no, take that idea, take it further. Put everything in the basket and then start picking up from the basket one after the other. Maybe half of the basket when you pick up, half of the idea is good half is bad. So, you throw half of the idea, take half of the idea and go.

So, generation of new idea and their judgment should not be simultaneous. First collect all the ideas put it inside a box; they should be separated by time, space, people, if possible. For example I generate idea and I should not kill that idea. So, I generated the idea, and then give it to the other person. So, many a times what people do is they do brainstorming session 20 people sit down, and do a brainstorming session. After the brainstorming session is over, so they all make a notes.

The other way round is 21 percent gives 20 ideas, he records all the 20 ideas. And he gives that all the recorded thing to the next two person and the next two person starts with a base and then he brings in more creativity, that is also practiced. But, a single person who generates should not kill the idea. Then, possible solutions should be generated in large quantity, you should always look for feasible solutions. Solutions which can solve the problem, which are close to the problem that is what we are. Possible solution should be generated in large quantities. First multiply the ideas produced, by inspiration, by 5 or even 10. So, inspiration first multiply the ideas produced by inspiration.

Then, seek a broad spectrum attack approach, do not try to take an idea, do not try to go to the finest point and then start killing that entire idea. Take a broad perspective, now you are putting the first level filter on the ideas. So, try to say this idea looks to be feasible, let us take it forward. This particular thing cannot be done. So, the entire idea is broken, so we should not do that. So, seek a broader spectrum attack approach.

Watch for opportunities to combine and improve ideas. So, A idea, B idea, C idea, so here is bad, here is good and here is bad. So, now take A good part, B good part, C good part, and combine and try to have it. If you have to do this combination and if these A, B, C is proposed by three different people, you should not have egos in accepting all the three, so that is what watch for opportunities to combine and improve the ideas as they generate. Consider all possible ideas, even apparently impractical things. Do not ridicule them. Never eliminate any idea, summarily. So, this is what whatever I said, we have put here. This is the ground rules.

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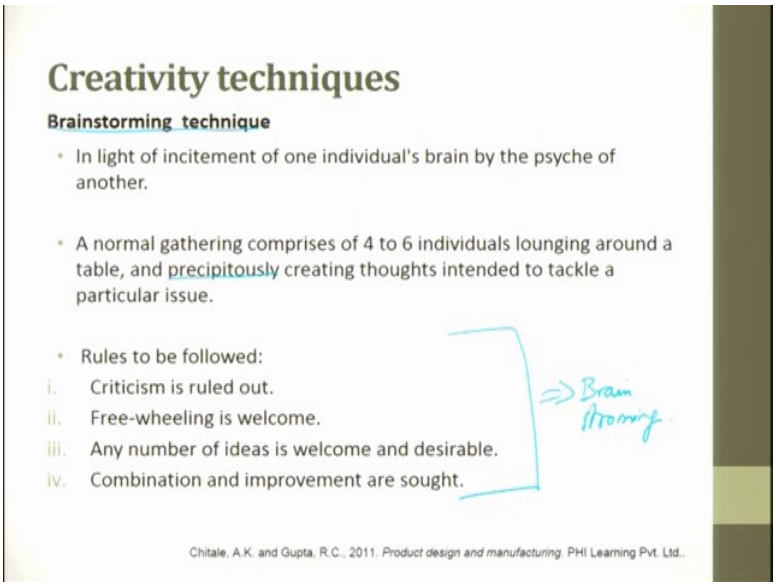

Brainstorming technique; in light of incitement of an individual's thought brain by the psychology of another, so this is brainstorming technique. And normal gathering comprises of 4 to 6 individuals lounging around a table and precipitously creating thoughts intended to tackle a particular issue.

Rules to be followed; criticism is ruled out, free-wheeling is welcome, any number of ideas is welcome and desirable, combination and improvement are sought. So, this are the rules which we have to follow for brainstorming, ok. So, free-wheeling is welcome, so anybody can talk anything, you can keep moving. And you make a conducive environment sit around and then keep discussing and start going towards it.

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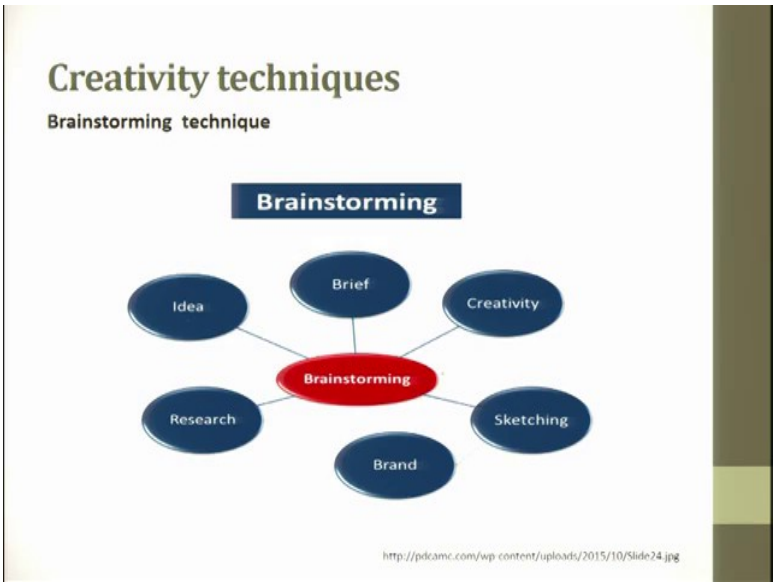

So, this is brainstorming technique. So, brainstorming will have techniques should have an idea, it should be brief, it should be creative, you can use sketching, you can use branding, you can also use research. So, you can try to generate or you can try to use all these things and start doing a brainstorming technique.

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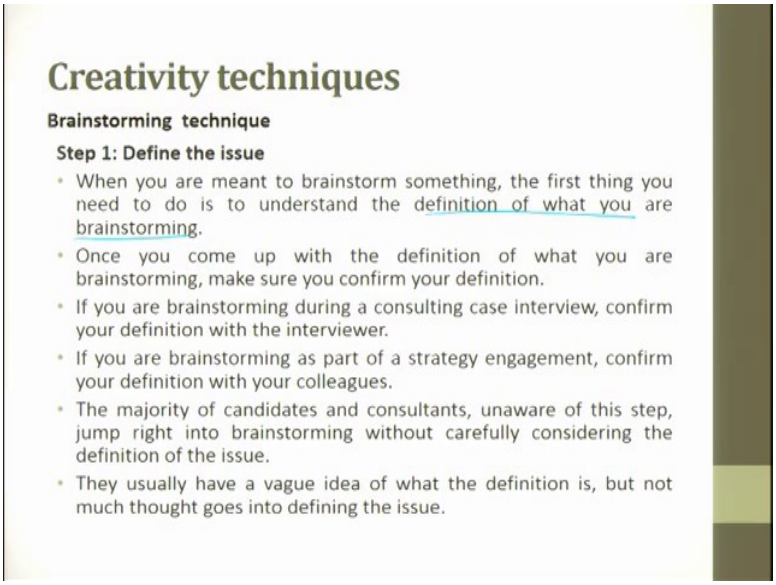

Step 1, define the issue. When you are meant to brainstorm something, the first thing you need to do is to understand the definition of what you are brainstorming. Many a times people

keep talking giving their opinion without understanding; what are they deliberating all about, so that is what we are saying. What are what is the definition of the problem and what are we all doing that is what we should know.

Once you come up with a definition of what you are brainstorming, makes your you confirm your definition. So, if you wanted to try to solve a problem, so you cannot say I want to solve this particular problem in this. Make a generic statement and then only you can have multiple ideas flowing into the generic statement. If you are brainstorming during a consulting case interview, confirm your definition with the interviewers.

If you are brainstorming as part of a strategy engagement, confirm your definition with your colleagues. The majority of the candidates and the consultant, unaware of this step, jump right to the brainstorming without carefully considering the definition of the issue. They usually have a vague idea of what the definition is, but not much thought goes into the defining of the issue.

For example, if I say, I want to become a rich man; very generic, very, very generic; right, so why should I become rich? So, the question comes is I want to be happy. So, the definition should be, I want to be happy and not that subset which says I want to be rich. See suppose let us assume, you want to become rich, I give a solution: work for 23 hours a day, take 1 hour rest. Yes, I will work for 5 years and then have a lot of health problems, I have become rich, but lot of health problems; it is of no use.

But, what you want in life, you want the happiness in life. So, if you write define the problem clearly; I want to be happy, then what will happen is when you start looking for solutions, you will say work for 8 hours, then do exercise for 3 hours, then spend with family for 2 hours, sleep 6 hours. So, now you see you will come with a solution, which will be more workable, so that is what definition of the problem is very, very important.

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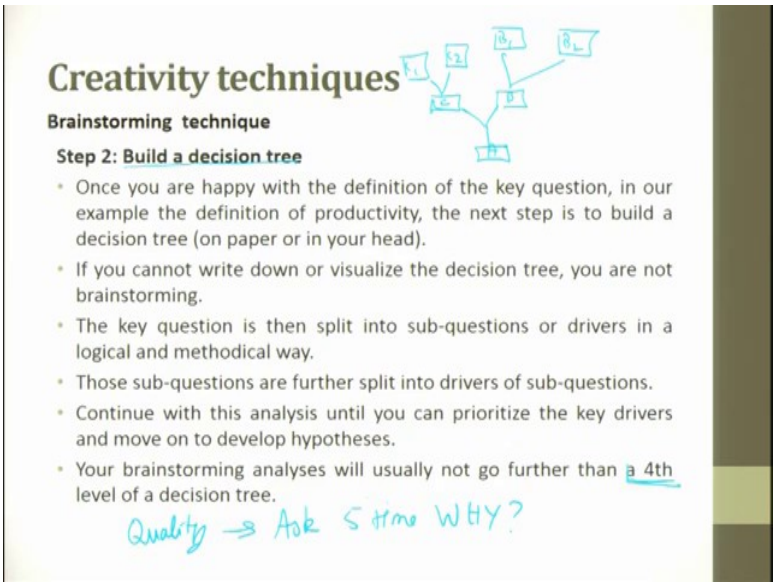

Next build a decision tree. Once you are happy with the definition of a key question, in our example the definition of productivity, the next step is to build a decision tree, ok. Decision tree, what is decision tree, ok. So, for used there is a start, then you have two alternative solutions; A, B, and C, then B will lead to B 1, and B 2, this is C; C will lead to C 1, and C 2. So, something this is a decision tree, it keeps on going, ok. If you cannot write down or visualize a decision tree, you are not brainstorming, ok.

The key question is then split into sub questions or drivers in the logical and a methodical way. Those sub questions are further split into drivers of sub-questions, so this is what I said. Continue with this analysis until you can prioritize the tree drivers and move towards the developed hypothesis. Your brainstorming analysis will usually not go further more than 4 steps, that is why in the quality tools, we have a tool which says ask 5 times; why? So, you will understand the root cause of the problem.

Thank you very much.