Brainstorming and TRIZ

Brian Campbell

Campbellbri@yahoo.co.uk

Brainstorming is rarely mentioned in TRIZ circles. In *The Innovation Algorithm,* p. 57, Altshuller discusses the technique and points how it is an improvement on trial and error, but it is much less effective than TRIZ. However, there are startling similarities between Brainstorming and many of the TRIZ tools and I believe it is a useful tool.

Let us begin by looking at some of the rules/aspects of brainstorming. (A useful introduction to brainstorming can be found in the *Creativity Tools Memory Jogger* P.31 –www.goalqpc.com)

Composition of brainstorming team.

The team will naturally contain the problem owner and relevant experts. However there should also be a person present who knows nothing about the problem and ideally works in a completely different field. If it is technical problem get an accountant on the team. If it is an accounting problem, invite an engineer. The reason for this is twofold. The problem owners will need to explain the problem to the outsider in simple terms and this forces the owners to think carefully about the nature of the problem. They will need to set the scene properly and provide background information. Without an outsider, there would be a tendency to launch straight into the problem and perhaps miss some vital background information.

Secondly the outsider will look at the problem in a totally different way. He or she will have no pre-conceived ideas, no pet theory and also will not be in competition with the experts. His or her seemingly simple questions can lead to some embarrassing moments. Why do you do such and such? Well …. Because we…. Do…we have always done it like that…..

No judgement - all ideas must be considered

Brainstorming must be carried out in an atmosphere free of criticism or even judgement in the initial phase. People are encouraged to keep the

ideas coming, get quantity not quality and trying to range as widely as possible. The evaluation is carried out later.

Excursion techniques

There will come a point after say ten minutes when the ideas dry up. At this point the facilitator might introduce the question "How might person X solve this problem?" Person X must be known to all – a famous film star, historical figure or someone in the news. The key aim is to try to get the members of the team to approach the problem from a different angle. It can also help to lighten the mood and so help the ideas to start flowing again.

Provocation

My favourite technique: turn the problem on its head. If the problem is how to reduce the wastage on a production line, focus on how to make it worse. It will be quite easy to generate a large number of ideas. The key point is that quickly many aspects of the process will have been looked at. Each of the ideas is then evaluated and considered in turn with a mind to improving the problem. If we had suggested removing temperature control we might decide to put it back. However we might say, without temperature control what would we do differently? Do we really need it? So fairly quickly we approach the problem from some very different angles.

An excellent example was a brainstorming session on crime prevention. To make crime worse, one of the suggestions was to remove all the police, as well as free guns for all, etc. In the evaluation phase the question was asked: Okay, if we have no police how can we reduce crime? The answer came back – we would have to do our own policing and the idea of neighbourhood watch was born.

So where does TRIZ come into all of this?

Composition of the team.

TRIZ brings to the table tools and techniques taken from across all disciplines and industries. The many problem definition tools also ensure that the problem is properly defined and considered from many different aspects – 9 windows particularly helps to define the problem well.

Having non-experts on the team would still be worthwhile but not essential.

No judgement

This is required in brainstorming to increase the quantity of the ideas – because the solution might lie anywhere. However with TRIZ by defining the problem and if (say) a trade off is detected, then the solution is not anywhere- it is in one of forty places. The brainstorming is then directed at a much more focused area. Initially perhaps to choose which of the 39 parameters might represent the improving and worsening features might apply. Once a sub-set of principles has been selected, each of them in turn can be brainstormed to determine how the principle might be used in practice. This is I feel the most difficult part of TRIZ - moving from the general solution to the specific solution, so brainstorming might help here.

Similarly if it was an s-field problem, then the brainstorming would be applied to the specific principle required. If it were a knowledge-based problem, then the brainstorming might be to determine who has solved this problem before.

Excursion Techniques

Within TRIZ there are many thinking tools to aid the thinking process.

Size Time Cost.
What if we made the plant much larger, much smaller? What would change?
What if we had more time? Less time?
What if we had an unlimited budget? Or what if we had no budget at all?

Smart Little People

How might an army of tiny intelligent people solve the problem? – definitely thinking out of the box.

Provocation Techniques

The use of Anticipatory Failure Determination springs to mind. This technique is used to look at intermittent problems within a process and is based on how to make the intermittent problem a permanent one. If the

right parameter is found to generate the problem all the time, then switching this parameter off should eliminate the problem.

Other Aspects

The Ideal Final Result would be a useful topic for brainstorming. Different people would undoubtedly have different views and this would help all team members to find out where their colleagues were coming from. The ideality equation would also be a useful subject for brainstorming. How to improve benefits, increase the number of benefits, how to reduce costs, how to reduce harm.

Conclusions

Brainstorming techniques are very useful, simple and powerful tools. They can be used to increase the effectiveness of TRIZ by helping to bridge the gap between the general solution and the specific. The combination of the rigour of TRIZ with the inspiration of brainstorming is I believe a very powerful combination.

About the Author

Brian is a physics graduate who spent 23 years in research and development within the glass industry. He came across TRIZ 3 years ago. He has attended several courses run by Oxford Creativity and CREAX and has read widely on the subject. He has used TRIZ to solve many real problems and is particularly keen to see TRIZ more widely adopted in the UK. He is the moderator of TRIZ UK an e-mail based discussion group.
TRIZUK-subscribe@yahoogroups.co.uk