Generating Alternatives and Creativity

Any engineering project will have a range of possible solutions. Your challenge is to list as many as you can so that you can present the client with some useful choices.

Brainstorming

There are a range of techniques that will help you be more creative. One easy method is brainstorming. The idea is to generate as many ideas as possible in an agreed amount of time. You might aim for 20 ideas in 10 minutes. As the ideas flow, great new ideas will emerge. Write down (in your logbook) all the ideas as they emerge.

Some crazy ones will emerge too, but that's ok. They can be eliminated later. The crazy ideas often provide the impetus for new, good ideas.

What goes wrong with brainstorming is that group members want to talk about, or *elaborate,* their ideas. This takes a lot of time. The other thing you will be tempted to do is to *criticise* other people's ideas. "That will never work, because ...". Resist this too. So, **no elaborating and no evaluating** during brainstorming. Just name the idea and move on.

At the end of 10 minutes, or the agreed amount of time, you can begin to **evaluate** the list. With a bit of luck, your group has produced a whole range of good ideas. Some new ideas might even emerge at this stage, sometimes by combining ideas on your existing list.

Sustainable creativity

One useful approach for generating alternative solutions is to use the sustainability criteria (explained in more detail in the next section). These require any solution to satisfy economic, environmental and social constraints. Of course, any solution must also satisfy technical requirements (strength, serviceability, etc).

For example, say we were looking at the future water supply for Melbourne, how could we use these four factors to help us generate alternative solutions?

Criterion	Possibly solutions
Technical	• Build another dam • Build a desalination plant • Install water tanks at homes to capture stormwater • Recycle wastewater for industry use • Install greywater recycling at home level
Economic	• Make water more expensive so that people use less
Environmental	• Encourage residents to plant gardens that require less watering
Social	• Create education programs to conserve water • Make laws to prohibit behaviour such as cleaning driveways using water

No doubt you can think of others to add to the list.

More information

There are many books and websites devoted to creativity. Look for Edward de Bono's work on Lateral Thinking and also look for information about TRIZ.

Exercise

Write down 20 (or more) ways to improve use of public transport in Melbourne.