Creative Thinking for the High Ability Student: Going Beyond the Basics

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Activity #1

• A bat and ball cost $1.10.
• The bat costs one dollar more than the ball.
• How much does the ball cost?
Activity #1

• How can we slow down our thinking?

By checking things out:

$1.05
$0.05
---------
$1.10
Activity #2

• Sketch 4 trees equidistant from each other.
Activity #2
Activity #3

• Use 6 toothpicks to generate 4 equilateral triangles.
• The length of the sides of all the triangles is the length of the toothpick.
• You cannot break the toothpicks!
What happened?
What is Cognitive Fixation?

"Thinking outside of the box is difficult for some people. Keep trying."
What is Cognitive Fixation?

It is the inability to produce more than one solution to a challenge due to mental blocks that prevent the exploration of further alternatives.
How does Cognitive Fixation occur?
How does cognitive fixation happen?

1) In exercises requiring a solution where examples are given, the answers tend to conform to the examples.
How does cognitive fixation happen?

Design a survival kit for the following natural disasters:

- Flood
- Storm
- Drought
<table>
<thead>
<tr>
<th>Parts</th>
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<tbody>
<tr>
<td>Handle</td>
</tr>
<tr>
<td>Container</td>
</tr>
<tr>
<td>Zipper</td>
</tr>
<tr>
<td>Pocket</td>
</tr>
<tr>
<td>Pouch</td>
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</tbody>
</table>
How does cognitive fixation happen?

2) The same way of solving problems is used even though the fundamentals of the problem may have changed.
How does cognitive fixation happen?

FILM vs DIGITAL
How does cognitive fixation happen?

3) Students are limited by their own basic definitions of the object. When given a challenge students find it difficult to reframe the use of an object to solve it. (Functional fixedness)
How does cognitive fixation happen?

Challenge:
Use the objects above to fix the candle to the wall such that the wax will not drip onto floor.
When students experience cognitive fixation, what can teachers do?
How can we help students overcome cognitive fixation?

a) Challenge basic problem’s assumptions using the tool “Ideal Final Result”
Design a survival kit for the following natural disasters:

- Flood
- Storm
- Drought
How can we help students overcome cognitive fixation?

<table>
<thead>
<tr>
<th>Parts</th>
<th>Ideas</th>
<th>IFR</th>
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<tbody>
<tr>
<td>Handle</td>
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<td>Container</td>
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<tr>
<td>Group A</td>
<td>Group B</td>
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<tr>
<td>---------------------------------------------</td>
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<tr>
<td>Students who did not take a Creative Studies Minor</td>
<td>Students who took a Creativity Studies Minor</td>
<td></td>
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</tbody>
</table>
Group A (no CS Minor)

- Flashlight/megaphone
- Indestructible antennae so you can receive radio/news feeds for further direction
- TV screen/alarm system
- CD player/sound system
- Water repellent
- A/C unit
- Path for air mattress/flotation device
- Fluid for use in cooking

* Contains blankets, first aid kit, weapons, cell phone
* Thought of everything I would want in case of an emergency or flood. Nothing too crazy

* Powered by solar energy
Group A (no CS Minor)

Flood Survival Kit

- First Aid
- Rain Boots
- Snuggie (to stay warm)
- Water
- Package of Food
- SPF 30 Sunscreen (so you don’t burn)
- Boat in a Box (inflatable)
- Stereo/Cd Player (for music to listen to)
- Games for Entertainment
Group B (CS Minor)

Survival Kit

- Rope
- Water
- Insulating material (e.g., firewood)
- Batteries
- Extra乐谱 for the缶: radio, flare, phone charger, matches...

Sickle

[unrolled] → [rolled]
Group B (CS Minor)

Inside:
- First aid medical supplies
- Dry food items
- Blanket
- Box of matches
- Safety swim devices

Outside:
- Neatly packed
- So it floats!
- It is light and easy to carry
- Lined with foam

Water tight seal opens
Inflatable Shoes

Sole filled w/ flotation device

If submerged in water, automatically inflates.
Group B (CS Minor)

**SURVIVAL BALL**

**Why Surviva-Ball?**
- Floating survival ball
- Keeps you on top of the flood
- Waterproof
- Plenty of room for more!

[Diagram showing a survival ball with a girl inside, surrounded by water and other items like food, water, and shelter.]
How can we help students overcome cognitive fixation?

b) Combine distant elements when producing a new solution

E.g. Use elements of an airplane to design furniture
How can we help students overcome cognitive fixation?
c) Phrase the challenge using the purpose of the invention instead of the object, for instance “design a container to drink from” instead of “design a cup”.
How can we help students overcome cognitive fixation?

Other examples:

1) In what ways might I (we) + verb?
   - carry liquid?
   - attract participants for my club?
   - improve traffic flow during peak hours?
How can we help students overcome cognitive fixation?

Other examples:

2) In what ways might I (we) + verb?
- attract participants to my club?
- enlist members in my club?
- persuade peers to join my club?
- draw enthusiastic fans to my club?
How can we help students overcome cognitive fixation?

Building creative thinking skills through questioning and idea generation will help students overcome cognitive fixation.
How can we help students overcome cognitive fixation?
How can we help students overcome cognitive fixation?

- How many ideas do you have?
- How many categories can you generate about them?
- Are the ideas or categories generated original? Why?

- How many questions can you produce?
- How many categories of questions have you generated?
- How important are those questions/categories? Why?
Thank You!

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