Applied Ideation and Design Thinking for Assistive Technologies

Today
Thinking about problems
Brainstorming and ideation
Practice brainstorms
Scenarios and storytelling
Presentation and wrap
Thinking about problems

**Problem**
- Observe: Investigate, Record, Analyze, Understand
- Explain: Contextualize, Substantiate, Diagram, Articulate

**Solutions**
- Brainstorm: Explore: Alternatives, Possibilities, Choices
- Cluster: Analyze, Prioritize, Eliminate, Elevate
- Express: Explain, Diagram, Mockup, Build

**Iterate**
- Evaluate: Try out on stakeholders, Test with users
- Reframe: Redefine, Reprioritize, Redirect, Replan
Ideation and inspiration

Genius is one percent inspiration and ninety-nine percent perspiration.

Thomas Edison, inventor

Inspiration is for amateurs. The rest of us just show up and get to work.

Chuck Close, artist
Brainstorming

Defined by Alex Osborn in 1939
“Storming a problem in a commando fashion”
*Your Creative Power*, 1949
*Applied Imagination*, 1953

Took on a life of its own
BBDO - Alex Osborn
MIT Creative Engineering Lab - John Arnold
Stanford Design Division - Bob McKim

IDEO
d.school at Stanford and Potsdam

Sources: _; Verner Reed/Time & Life Pictures/Getty Images; Gayle Curtis
The Osborn Rules for Brainstorming
Osborn Rule #1

DEFER

JUDGEMENT

Say Yes
Fifty phrases that kill creativity

- Our place is different
- We tried that before.
- It costs too much.
- That's not my job.
- They're too busy to do that.
- We don't have the time.
- Not enough help.
- It's too radical a change.
- The staff will never buy it.
- It's against company policy.
- The union will scream.
- That will run up our overhead.
- We don't have the authority.
- Let's get back to reality
- That's not our problem.
- I don't like the idea.
- I'm not saying you're wrong but...
- You're two years ahead of your time.
- Now's not the right time.
- It isn't in the budget.
- Can't teach an old dog new tricks.
- Good thought, but impractical.
- Let's give it more thought.
- We'll be the laughingstock of the industry.
- Not that again.
- Where'd you dig that one up?
- We did alright without it before.
- It's never been tried.
- Let's put that one on the back burner for now.
- Let's form a committee.
- It won't work in our place.
- The executive committee will never go for it.
- I don't see the connection.
- Let's all sleep on it.
- It can't be done.
- It's too much trouble to change.
- It won't pay for itself.
- It's impossible.
- I know a person who tried it and got fired.
- We've always done it this way.
- We'd lose money in the long run.
- Don't rock the boat.
- That's what we can expect from the staff.
- Has anyone else ever tried it?
- Let's look into it further.
- We'll have to answer to the stockholders.
- Quit dreaming.
- If it ain't broke, don't fix it.
- That's too much ivory tower.
- It's too much work.
Osborn Rule # 2

GO FOR

QUANTITY

FLUENCY + FLEXIBILITY
<table>
<thead>
<tr>
<th>Put to other uses?</th>
<th>Magnify?</th>
<th>Minify?</th>
<th>Reverse?</th>
</tr>
</thead>
<tbody>
<tr>
<td>New ways to use as is?</td>
<td>What to add?</td>
<td>What to subtract?</td>
<td>Transpose positive and negative?</td>
</tr>
<tr>
<td>Other uses if modified?</td>
<td>More time?</td>
<td>Smaller?</td>
<td>How about opposites?</td>
</tr>
<tr>
<td>Adapt?</td>
<td>Greater frequency?</td>
<td>Condensed?</td>
<td>Turn it backward?</td>
</tr>
<tr>
<td>What else is like this?</td>
<td>Stronger?</td>
<td>Miniature?</td>
<td>Turn it upside down?</td>
</tr>
<tr>
<td>What other idea does this suggest?</td>
<td>Higher?</td>
<td>Lower?</td>
<td>Reverse roles?</td>
</tr>
<tr>
<td>Does the past offer parallel?</td>
<td>Longer?</td>
<td>Shorter?</td>
<td>Change shoes?</td>
</tr>
<tr>
<td>What could I copy?</td>
<td>Extra Value?</td>
<td>Lighter?</td>
<td>Turn tables?</td>
</tr>
<tr>
<td>Whom could I emulate?</td>
<td>Plus ingredient?</td>
<td>Omit?</td>
<td>Turn other cheek?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modify?</th>
<th>Combine?</th>
<th>Substitute?</th>
</tr>
</thead>
<tbody>
<tr>
<td>New twist?</td>
<td>How about a blend, an alloy, assortment, ensemble?</td>
<td>Who else instead?</td>
</tr>
<tr>
<td>Change meaning, color, motion, sound, odor, form, shape?</td>
<td>Combine units?</td>
<td>What else instead?</td>
</tr>
<tr>
<td>Other shapes?</td>
<td>Combine purposes?</td>
<td>Other ingredient?</td>
</tr>
<tr>
<td></td>
<td>Combine appeals?</td>
<td>Other process?</td>
</tr>
<tr>
<td></td>
<td>Combine ideas?</td>
<td>Other place?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other approach?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other tone of voice?</td>
</tr>
</tbody>
</table>
Transformation cards

Source: the MIT Creative Engineering Laboratory, ca 1956 – Adapted from Osborn's Applied Imagination
Osborn Rule #3

GET RADICAL

WILD     WEIRD     ABSURD     STUPID

Easier to tone down than pump up

Source: Obey the Pure Breed
“Out of a hundred ideas, the first sixty ideas produced five that were actually new or different, the next twenty produced nothing but laughter, and ideas eighty to a hundred produced another ten that were amazing. Thankfully, we didn’t give up when the well ran dry around idea number sixty.”

Source: Adapted from Dev Patnaik, The Ebb and Flow of Ideas
Osborn Rule #4

LEAPFROG

Mash up
Build on other people’s ideas
Let go of your own

Source: Rolf Faste
## Ground Rules Recap

### Four content rules

**Defer Judgment**
- Say Yes!
- Save analysis and evaluation for later

**Go for quantity**
- Fluency - lots of ideas
- Flexibility - lots of *different* ideas

**Get radical**
- Encourage wild, eccentric, improbable ideas
- Easier to tone down than pump up

**Leapfrog**
- Build on others’ ideas
- Let yours go into the mix

### Four process rules

**Stay focused on topic**
- A stray thread can throw you off
- Turn it around to something that relates

**One conversation at a time**
- Let everyone get their idea out
- Bring side discussions onto the table

**Headline it**
- Express the essence and move on
- Maintain flow

**Be visual**
- Get the right brain working
And, for best results...

**Four setup tips**

Explicitly agree

“Let’s brainstorm!”

“Yeah!”

Facilitate

“What else...?”

Record

Capture the thought

Time box

Define the play period
Exercise – Brainstorm a Project

Start with your problem

1. Form small groups
2. Pick one problem for this exercise
3. Brainstorm 15 minutes
4. Pick a solution
5. Present to the class
   1. User
   2. Context
   3. How it works
Creating solution scenarios

Five story components

**User**
Identify and characterize a user, based on the target user group

**Context**
Describe context or situation in which the problem exists

**Problem**
Describe an incident or condition that motivates the use of the solution

**Solution**
Show how they access and use the solution to address their need

**Outcome**
Describe the outcome of the situation - the payoff, the problem solved, the happy user
Better Brainstorms

Four content rules
1. **Defer Judgment**
   Say Yes!
   Save analysis and evaluation for later
2. **Go for quantity**
   Fluency - lots of ideas
   Flexibility - lots of different ideas
3. **Get radical**
   Encourage wild, eccentric, improbable ideas
   Easier to tone down than pump up
4. **Leapfrog**
   Build on others’ ideas
   Let yours go into the mix

Four process rules
5. **Stay focused on topic**
   A stray thread can throw you off
   Turn it around to something that relates
6. **One conversation at a time**
   Let everyone get their idea out
   Bring side discussions onto the table
7. **Headline it**
   Express the essence and move on
   Maintain flow
8. **Be visual**
   Get the right brain working

Better Scenarios

Five story components
1. **User**
   Identify and characterize a user, based on the target user group
2. **Context**
   Describe context or situation in which the problem exists
3. **Problem**
   Describe an incident or condition that motivates the use of the solution
4. **Solution**
   Show how they access and use the solution to address their need
5. **Outcome**
   Describe the outcome of the situation - the payoff, the problem solved, the happy user