Academic Versus Industry Mindset
Presented by Biomedical Engineering Calgary in partnership with the Reproduction and Regenerative Medicine Research Group

November 22, 2018
2:00 p.m. - 4:00 p.m.
Health Sciences Centre
Theatre 3

**Dr. Eric Jervis**
Principle Scientist
Research and Development
STEMCELL Technologies
Vancouver, BC

How are your graduate studies preparing you for a career? How is industry different from academic research? What skills will future employers look for that will give you a competitive advantage in your job search?
The reality is that most students miss great opportunities for developing skills that will be needed in industry because they have not considered what industry will be looking for. Dr. Jervis will present experiences and lessons learned as he moved from an academic position to an industry position. He will provide examples of skills that industry requires, and ways to gain these skills during graduate studies. Dr. Jervis will also review the new product proposal process at STEMCELL and discuss key challenges in going from an idea to a marketable product.

BME-Ignite-STEMCELL.eventbrite.ca

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**SYMPOSIUM:**
**WHAT CAN YOU BE WITH YOUR GRAD DEGREE?**

December 13, 2018
CSM Foothills Campus | Calgary, AB

https://cumming.ucalgary.ca/gse/proskills/symposium-what-can-you-be-your-grad-degree
Visual Communication
Derrick E. Rancourt
Cumming School of Medicine
University of Calgary
Acknowledgements

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• Sabrina Anderson

My Team
• Charlie Hsu
• Suman Nath
• Pooyan Naghsh

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• Alex Bruton

Taylor Centre for Teaching & Learning
• Scholar Program
Visual Communication is an effective way for students to:

1. Engage community, and
2. Pursue inquiry-based learning,
3. Persuade others of their work’s value,
4. Market themselves to potential mentors and employers.

Thesis Statement
Why is it Useful?

- Enhances
  - Thinking
  - Representing
  - Communicating
- Helps create more compelling, usable products
What is Visual Thinking?

• An approach to understanding, creating, and communicating
• A collection of visually-based concepts and methods
  • Information Visualization
  • Mindmaps
  • Sequential visual representations
Science and Persuasion
Storyboarding

key activities
value proposition
customer relationships
key partners
customer segments
cost structure
key resources
revenue streams
channels
# Storyboarding

<table>
<thead>
<tr>
<th>Key Partners</th>
<th>Key Activities</th>
<th>Value Proposition</th>
<th>Customer Relationships</th>
<th>Customer Segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>-FSCD</td>
<td>-Ensure aids CPR-C &amp; police checked</td>
<td>-Connect aids to families</td>
<td>-Families</td>
<td>-Families with an autistic child/teen/adult</td>
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<tr>
<td>-PDD</td>
<td>-Assist with paperwork</td>
<td>-Help families and aids with paperwork</td>
<td>-Employees</td>
<td>-University students/adults</td>
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<tr>
<td>-Gov Alberta Disability Services</td>
<td></td>
<td>-Save families and aids time and energy.</td>
<td></td>
<td>-wanting steady work</td>
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<td><strong>Key Resources</strong></td>
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<tr>
<td>-Insurance</td>
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<td>-Connection to key partners</td>
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| Channels               |                                                     |                                                        |                             |                                        |
| -Families via partners |                                                      |                                                        |                             |                                        |
| -Campus Ads            |                                                      |                                                        |                             |                                        |
| -Social media          |                                                      |                                                        |                             |                                        |
| -Website               |                                                      |                                                        |                             |                                        |

| **Cost Structure**     |                                                     |                                                        |                             |                                        |
| -Business Training     |                                                     |                                                        |                             |                                        |
| -Transportation        |                                                      |                                                        |                             |                                        |
| -Computer, Internet, website |                                            |                                                        |                             |                                        |
| -App Development       |                                                      |                                                        |                             |                                        |

| **Revenue Streams**    |                                                     |                                                        |                             |                                        |
| -Portion of wages      |                                                     |                                                        |                             |                                        |
| -Base fee for use of service |                                              |                                                        |                             |                                        |
| -Sale of App           |                                                      |                                                        |                             |                                        |
Common creativity blockers:
1) Fear of the messy unknown,
2) Fear of being judged,
3) Fear of the first step, and
4) Fear of losing control.
Applications

- Informal vs. formal
- Self vs. world

- Think
- Share
- Collaborate
- Convince

- Vizability - methods for understanding and communicating
- Mindmaps - specific method for representing information
- Sequential Art Concepts - application of temporally based visual representations (e.g. Film, Comics)
- InfoViz guidelines - how to best communicate through spatial representations (Tufte, Kosslyn, others)
- Vizability - methods for understanding and communicating
Vizability

- Attribute
- Parameter
- Local
- Global
Mind (Concept) Mapping

Maps show dead ends, side routes & roads leading off map.

i. mind mapping
ii. writing web

i. messy
ii. free flowing

can be refined

is purposeful because
ought to be

helps you

organize thoughts
plan writing
ideas
new ideas can emerge

is also called
linear outlines
can lead to
where
the flow is visible and can be changed

is a
can be
discussion tool
that can be
informal & democratic (people's ideas are included)

writing tool
links can be made

i. process
ii. with steps

Storyboarding Research

Mixture of ECM and cellular proteins

Decellularization

Homogenize

ECM Extraction

Polymerize into ECM-gels in plates

Identification of main components then remake ECM-gels with these components

Plate ESCs

Mass spectrometry of ECM-gels

ECM-gels

Matrigel/Laminin

Transfer to bioreactors for further expansion and differentiation

Differentiation

ECM-gels

Matrigel/Laminin
“If the statistics are boring, then you’ve got the wrong numbers.”
Tufte 2009
Graphical Integrity

• *Lie Factor* = \( \frac{\text{size of effect shown in graphic}}{\text{size of effect in data}} \)

Should be ~ 1

< 1 = understated effect

> 1 = exaggerated effect

\[
LF = \frac{4280\% \text{ (change in volume)}}{454\% \text{ (change in price)}} = 9.4
\]
Graphical Integrity

Lower data-ink ratio (worse)

Higher data-ink ratio (better)
The Process of Visual Thinking

LOOK
SEE
IMAGINE
SHOW
Activities

- Scan across the whole landscape. Build a big picture; note that there are forests and trees... and leaves, as well.
- Find the edges and determine which way is up. Establish the limits of our view and the fundamental coordinates of the data in front of us.
- Make an initial pass at screening out the noise; separate the visual wheat from the chaff.
Activities

• Filter for relevance: Actively select those visual inputs worth another look and dismiss others. (Then later go back and check again.)

• Categorize and make distinctions: Separate the wheat into different categories by type.

• Notice patterns and clump creatively; identify visual commonalities among inputs, and larger commonalities among categories.
Activities

• Close your eyes to see more: With all visual inputs fresh in the mind, look with your eyes closed and see if new connections emerge.
• Find analogies: Ask, “Where have I seen this before?” and then imagine how analogous solutions might work in this new situation.
• Manipulate the patterns: Turn pictures upside down, flop them left to right, switch coordinates to turn them inside out. See if something new becomes visible.
• Alter the obvious: Push visual ideas by finding multiple ways to show the same thing.
Activities

• Clarify your best ideas: Prioritize all visual ideas so that the most relevant come to the top.

• Nail things down: Pick the appropriate visual framework and get your ideas down on paper or up on the board.

• Cover all the W’s: Make sure that who/what, how much, where and when are always visible; let how and why emerge as the visual punch line.
Visual Thinking Loop
How About a Little Persuasion?

- Elements of Presentation
- Persuasion & Argument
- The 5 P’s
  - Plan
  - Prepare
  - Practice
  - Positivity
  - Presence

[Image of a book cover]

https://cumming.ucalgary.ca/gse/home/how-about-more-persuasion-our-research-seminars
Performance Grid

- Audience daydreams, performs other tasks, pretending to listen
- Audience interested but having difficulty staying focused
- Audience is engaged but dismisses the event as superficial
- Ideas Moved into Action
Thesis Statement
3 Minute Thesis
Title that hints at the underlying issue or question and is formatted in “sentence case”

Name(s) here

1Institute, 2Department, University of Calgary

Introduction
Less is More

Methods
Less is More

Results 1
Less is More

Thesis Statement
(Graphical Abstract)
Results 1, 2, 3

Other Results
Less is More

Results 2
Less is More

Conclusions
Less is More

References

Acknowledgments

Contact Information
Persuasion vs. Argument

- Persuasion involve tactics to move people to a position, a belief, or a course of action.
- Argument is a specific kind of persuasion based on the principles of reasoning.
- It involve establishing a claim and then proving it with the using logical reasoning, examples, and research.
Structure of an Argument

- Introduction
- Thesis Statement
- Background Information
- Reasons and Evidence
- The Opposing View and the Refutation
- Conclusions
INFLUENCE + PERSUASION
How to influence and persuade others in ethical, effective and sustainable ways

6 universal principles

Reciprocity
- People are most likely to give back when what's given is unexpected and personalized.
- Power to those who give first.

Authority
- Expertise and credibility matter.
- Trust - quickly present a small drawback or weakness about your case before you present your compelling case.

Liking
- People are more likely to say yes to people that they like.
- Complement people to operate.

Scarcity
- People want things that are rare/unique and difficult to obtain.
- Present case before you speak.

Consistency
- People want to live up to the commitments they make.
- Look for people to make small commitments - a step on road to change.

Social Proof
- People will align to what others are doing.
- Share good bits about what others are doing.

BEWARE
- Can work for both desirable and undesirable behaviors.

Based on work of Robert Cialdini
The 5 P’s

- Plan
- Prepare
- Presence
- Positivity
- Practice
Plan

- What is your goal?
  - Best approach to reach goal
  - Limitations
- Start With Your Conclusions
  - Start and end well
  - Framework/Outline
Know Your Audience

Audience awareness is essential
• What is their position?
• How committed are they?
• Will they consider other views?
• What will their objections be?

<table>
<thead>
<tr>
<th>Style</th>
<th>Audience Says</th>
<th>You Say</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUDITORY</td>
<td>Did I hear you right? Sounds exciting. That’s music to my ears. Your message rings true to me. Talk me through this...</td>
<td>Use auditory metaphors: “music to my ears” Respond with words like “hear,” “sounds,” “rings true...” Focus on what people said and what it sounds like.</td>
</tr>
<tr>
<td>VISUAL</td>
<td>We are seeing eye-to-eye. I’m not sure I see your point. The future looks bright. It appears as if we have a long road ahead of us.</td>
<td>Draw a picture or use an image to make a point. Respond with words like “see,” “looks,” “catch sight of...” Use visual metaphors. In stories, describe what you see in the environment.</td>
</tr>
<tr>
<td>KINESTHETIC</td>
<td>I feel like we are getting somewhere. It seems like a rough road ahead. He’s carrying a heavy load. Let’s get a handle on this. Can we smooth this out?</td>
<td>Use feeling metaphors: Respond with words like “feel,” “sense,” “intuit...” In stories, describe texture. Get them on their feet and use an active exercise.</td>
</tr>
<tr>
<td>DIGITAL</td>
<td>Let me show you how we came to this... We have three options. This makes sense because... We can double our returns with 10% more resources.</td>
<td>Show a graph. Give numbers and facts. Use language that quantifies. Go in chronological order, use sequence and logic to organize thoughts.</td>
</tr>
</tbody>
</table>
Prepare

Make It Interesting!
• Informative
• Fun
• Lecture/Discussion/Activity
• Audience Interaction

“Your brand is what other people say about you when you’re not in the room.”
~Jeff Bezos
Anchor Story

FUR BEARING TROUT

Very Rare

CAUGHT WHILE TROLLING IN LAKE SUPERIOR OFF GROS CAP, NEAR SAULT STE. MARIE, DISTRICT OF ALGOMA

It is believed that the great depth and the extreme penetrating coldness of the water in which these fish live, has caused them to grow their dense coat of (usually) white fur.

Mounted by ROSS C. JOBE, Taxidermist of Sault Ste. Marie, Ontario

anchoring-a-simple-storytelling-trick-to-make-data-approachable-and-memorable
Practice, Positivity, Presence

Articles
1) Power posing, imposter syndrome & the giver-taker spectrum
2) The 5 P’s to destress the thesis defense
3) TOYFing the PhD candidacy exam
Questions