Promoting systems thinking and challenging students to tackle “wicked problems” through an interdisciplinary student case competition

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Who we are

Katelyn Godin,
occasional tree hugger.

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Beyonce superfan.

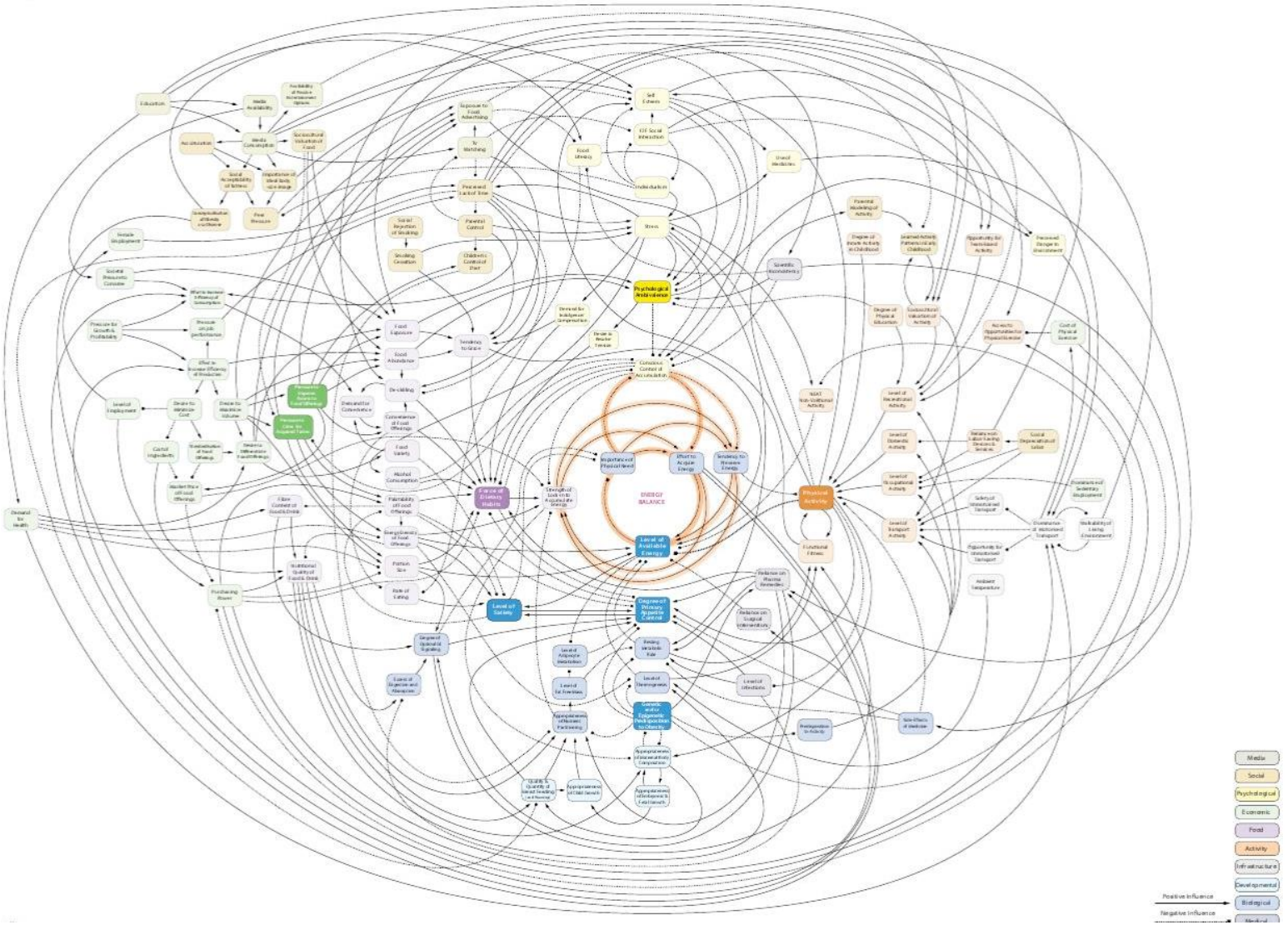
What makes a problem “wicked”?

Characteristics of wicked problems

- Problems have many causes
- No one solution
- “Fuzziness”

Naaldenberg et al. (2009); Murgatroyd (2010)

Obesity systems map



Vandenbroeck, Goossens, & Clemens (2007)

Take-away points

- Systems-thinking is key for examining today's wicked problems – and solutions
- Systems-thinking can be embedded in education at numerous levels
- Specific classroom assessments and activities can be used to promote students' use of systems-thinking
- There are numerous challenges and learning benefits of using these classroom strategies

What is “systems-thinking”?

- A lens used to look at the world and the complex challenges within it
- A recognition of the complexity underlying the whole of a system and the interrelationships between each factor
- Rooted in interdisciplinarity
- An effective approach for tackling “wicked problems”

Naaldenberg et al. (2009); Brown et al. (2010)

A shift to systems-thinking

- Need to equip students with *21st century skills*
  - Creativity
  - Critical thinking
  - Teamwork
  - Ability to work in interdisciplinary groups
  - Leadership
  - Translate knowledge in a meaningful way
  - Presentation skills

Shlafer et al. (2016); Mobley et al. (2014); Neuhauser et al. (2007)

Systems-thinking in education

- Departmental-level
- Program-level
- Course-level
- Individual assignments & activities

Opportunities P.1

- Inquiry/problem-based learning
  - Real world problem
  - Tangible products that will be used by others
  - Process of offering a solution, testing, revising

Murgatroyd (2010); Mobley et al. (2014); Sharp (2015)

Opportunities P.2

- Guest lecturers
- Creating a system maps/ conceptual framework
- Interdisciplinary journal clubs and book discussions

Murgatroyd (2010); Mobley et al. (2014); Sharp (2015)

Benefits P.1

- Development of high-level cognitive learning outcomes
- Students more apt to make mistakes
- Better comprehension of problems
- Greater student engagement
- Learning the culture and language of other disciplines

Murgatroyd (2010); Hmelo-Silver, Duncan, & Chin (2007); Mobley et al. (2014); Naaldenburg et al., 2009; Thomas, 2012

Benefits P.2

- Reinforce and connect earlier knowledge
- Students learn from each other
- Challenge pre-conceived notions
- Building tolerance and respect for other disciplines
- Disadvantaged students benefit most

Murgatroyd, 2010; Hmelo-Silver, Duncan, & Chin, 2007; Mobley et al., 2014; Ng et al., 2010; Sharp, 2015; Chanan et al. 2012

Challenges P.1

- Course curricula that examine wicked problems from one disciplinary lens
- Risk aversion
- Limited resources

Murgatroyd (2010); Thurman, Volet, & Bolton (2009); Mobley et al. (2014); Neuhauser et al. (2007)

Challenges P.2

- Communicating across disciplines
- Lack of inter-departmental collaboration
- Individualistic learners
- + it’s tough!

Murgatroyd (2010); Thurman, Volet, & Bolton (2009); Mobley et al. (2014); Neuhauser et al. (2007)

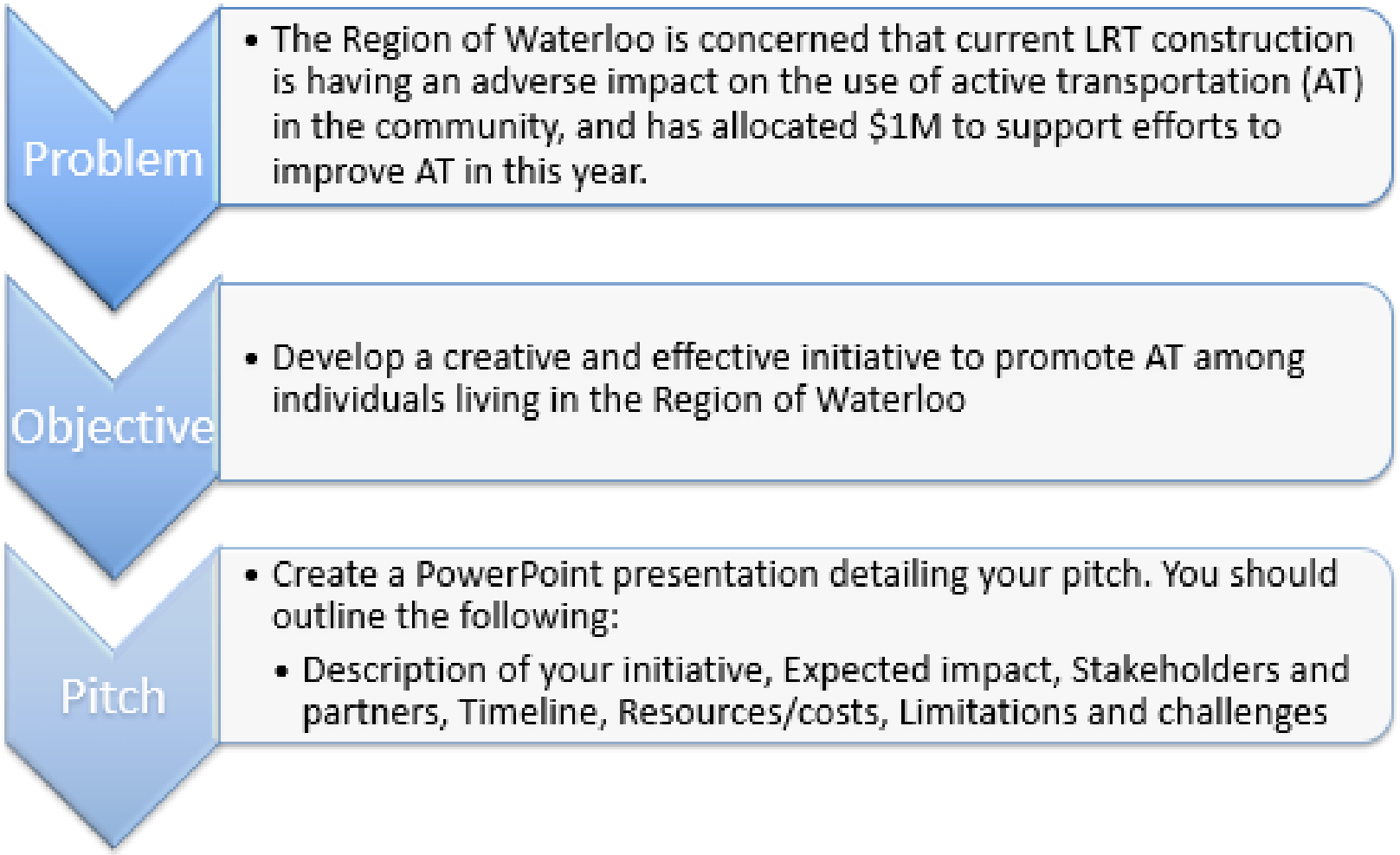
The Perfect Pitch

canadian obesity network

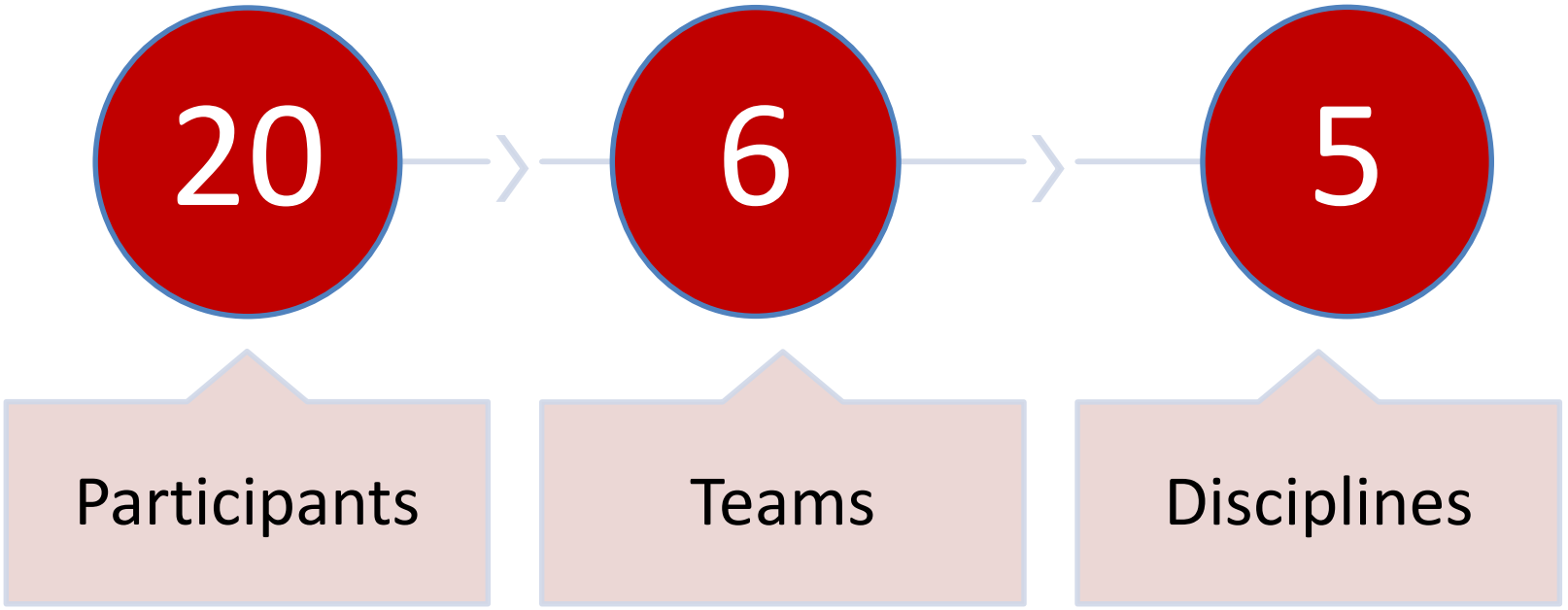
Event Timeline

9:15 – 9:30	Presentation of the case wicked problem
9:30 – 11:00	Groups prepare their pitch
11:00 – 12:00	Introduction of panelists Presentations 3 min. pitch, 5 min. questions
12:00 – 12:30	Lunch, tallying of votes
12:30	Announcement of winners!

The challenge



Participants



Judges

- (*Clockwise*) Michelle Pinto, Theron Kramer, Dr. Rhona Hanning, Robin Mazumder

- Judges scored pitches according to:
  - creativity, use of evidence, demonstration of interdisciplinarity, presentation, and viability

Outcomes

- Facilitation and logistics of activity very smooth
- High degree of engagement from students
- Diversity in judging panel allowed for constructive feedback to groups

Challenges

- Recruitment of students outside of health-related fields
- Many groups focused on single, innovative interventions, rather than multi-component approaches
- Preparation of event planning timeline, case study, and promotion materials was time-intensive
  - Materials can be re-used for future events

In Closing

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