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Developing a Business Model
UAB Pediatrics Fourth Fridays Series
Continuing Medical Education
Friday June 24, 2016

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Objectives: At the conclusion of this workshop, participants will be able to identify and describe:

- teams, team science and the *Science of Team Science*
- Differences between creativity, innovation, entrepreneurship and strategy
- 12 potential sources of innovation conflicts
- 3 primary types of conflict in science teams
- 10 steps of collaboration planning
- where to find additional team science resources



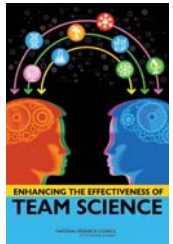
NIH Grant Review Criteria

- Significance
- Investigator(s)
- Innovation
- Approach
- Environment
- Protection of Human Subjects
- Inclusion of Women, Minorities, and Children




National Academies Report: Enhancing the Effectiveness of Team Science

- National Science Foundation
- National Academy of Sciences
- National Academy of Engineering
- Institute of Medicine
- National Research Council

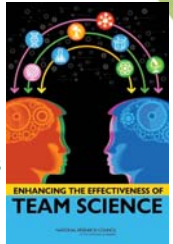


Committee on the Science of Team Science, Cooke, N., Hilton, M., Editors. *Enhancing the Effectiveness of Team Science*. Washington, DC: The National Academies Press; 2015 Apr 24.




Current trends in scientific research

- 90% of all science and engineering pubs are by 2 or more authors
- Most pubs authored by 6-10 researchers across multiple institutions
- Researchers are not always academics
- Team size continues to increase



Committee on the Science of Team Science, Cooke, N., Hilton, M., Editors. *Enhancing the Effectiveness of Team Science*. Washington, DC: The National Academies Press; 2015 Apr 24.



What is a team?

- **“Two or more individuals with different roles and responsibilities, who interact socially and interdependently within an organizational system to perform tasks and accomplish common goals”** (NAP report, p. Sum-1).



Committee on the Science of Team Science, Cooke, N., Hilton, M., Editors. *Enhancing the Effectiveness of Team Science*. Washington, DC: The National Academies Press; 2015 Apr 24.

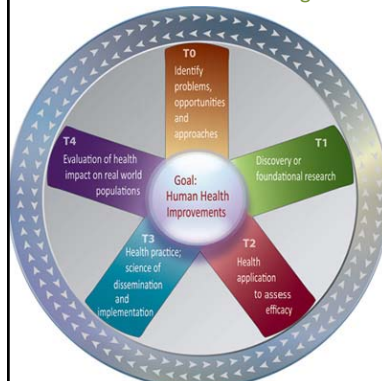


What is Team Science?

- “Team science is a **collaborative effort** to address a **scientific challenge** that **leverages** the strengths and expertise of professionals trained in different fields.” (www.teamsciencetoolkit.cancer.gov/Public/WhatIsTS.aspx)
- “Team science initiatives are designed to promote collaborative – and often **cross-disciplinary** – approaches to analyzing research questions about particular phenomena...” (Stokols, Hall, Taylor, & Moser, 2008, pp. 577-78)
- “Teams have emerged as a pivotal form for organizing **translational science** efforts. Such teams involve **multiple stakeholders** who are increasingly drawn from a **variety of disciplinary and organizational boundaries** and serve a variety of roles.” (Winter & Berente, 2012, p. 443)
- “More specifically, ‘team science’ is expected to **combine specialized expertise**, theoretical approaches, and research methods **across disciplinary boundaries**, solving... complex problems and producing high-impact science.” (Börner et al., 2010, p. 1)



Translational Science Paradigm



U. Of Washington, T-Phases
<https://www.ihhs.org/investigators/definitions/translational-research>



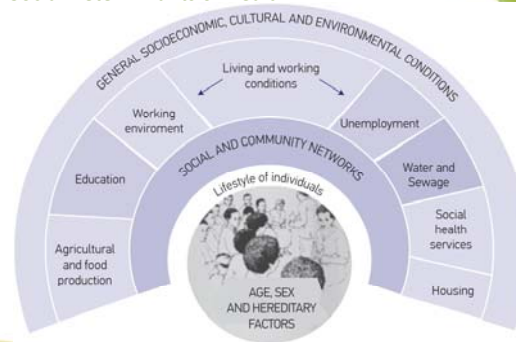
Patient Centered Outcomes Research Institute (PCORI)



<http://www.theamericannurse.org/index.php/2012/04/02/supporting-research-with-patient-centered-outcomes/>



Social Determinants of Health



Community-Based Participatory Research

Source: <https://ui-unc.edu/story/geographers-doctors-and-community-members>

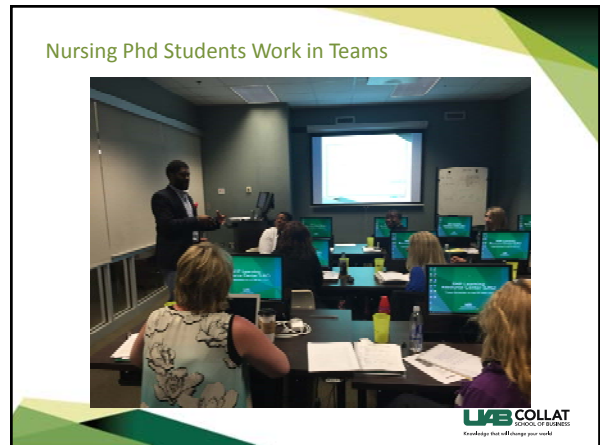
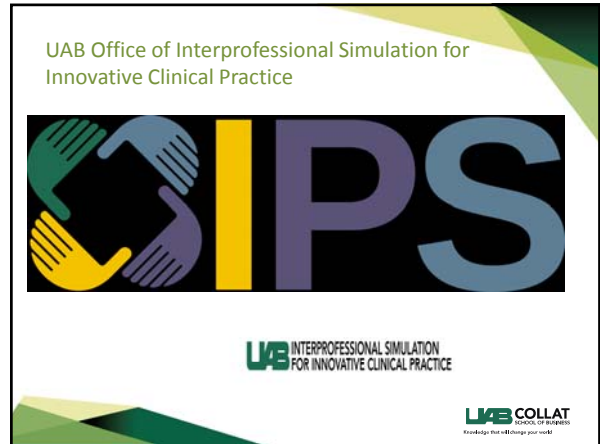
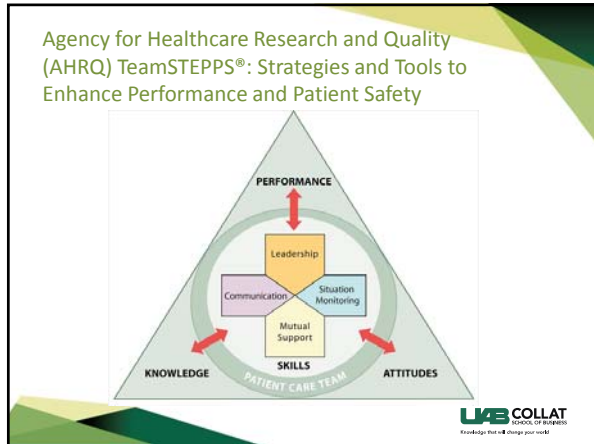


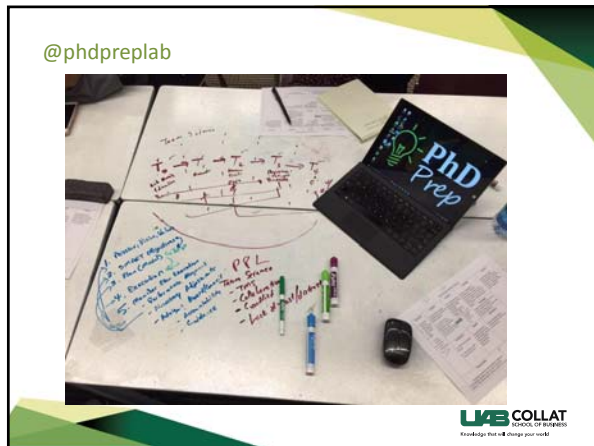
Source: <http://cslr.gmu.edu/cslr-capabilities/community-based-participatory-research/>



Community Health Research: Tracking Vacant and Abandoned Property







The Business of Translational Team Science

- Science requires Creativity
- Science requires Innovation
- Science requires Entrepreneurship
- Science requires Strategy

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The Business of Translational Team Science

Team-Based Creativity

- The **exchange** and **combination** of **divergent** yet **complementary** bits of information between 2 or more team members that produces something that is both **novel** and **potentially useful** (Amabile, 1983; Amabile et al., 1996; Gino et al., 2010; Nahapiet & Ghoshal, 1998)

Team-Based Innovation

- Implementation of a novel or useful discovery or product (Hulsheger et al., 2009)
- Translation (taking action to move and transform the science from one phase to another)

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The Business of Translational Team Science

Team-Based Entrepreneurship

- Opportunity-seeking behavior.
- Commercialization. Tech transfer. Start-up activity. University spin-offs. Intellectual property. Licensing. Patent protection. Business incubation.
- Income generation. Profit maximization. Wealth creation.

Team-Based Strategy

- Advantage-seeking behavior.
- How to out-perform and out-compete others. (e.g. Ireland, Hitt and Simon, 2003)
- Sustainability. Long-range planning.

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NSF Innovation Corps and I-Corps™ at NIH

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Business School Faculty

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Research Coordinator Training

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Birmingham Education Foundation

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8th Graders Innovating at Phillips Academy

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Daddy's Pooh Pooh (Web-Based Morning Show for Kids)

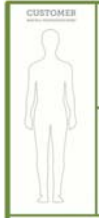
<https://www.linkedin.com/public-views/what-my-7-year-old-daughter-and-i-are-researching-anthony-c-head-ah-4hrkpr0f-post>

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Business Model Canvas: A Tool for Teams

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Customer



- Recipients of care/treatment
- Research Subjects
- Sample/Patient Populations
- Funders
- Peer Reviewers
- End users (e.g. physicians, care givers, etc)

Problem



- Conditions/Diagnosis
- Food Desert, Blight, Crime
- Prevalence/Severity/Frequency
- Physician/Caregiver challenges
- Pains, Gains, Jobs to be Done
- Gaps in theory/practice

Competition



- Current plans of care/treatment
- Alternatives
- Effectiveness
- Satisfaction with current care/treatment
- Competing theories, research teams, etc

Solution



- Proposed plan of care/treatment/intervention
- Value Proposition
- Specific Aims

Benefit



- Proposed benefit to subjects?
- How does the proposed science:
 - Relieve pains?
 - Create desired gains?
 - Facilitate getting jobs done more cheaply or efficiently?
- Theoretical Contributions
- Practical Contributions

Advantage



- Novelty/Innovation
- Why should subjects enroll or remain in the study?
- Why should your science be funded? Published?
- Why should providers adopt your product or approach over competing alternatives?

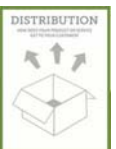
Message




- What is your “brand”?
- How will you establish and build trust?
- How will your subjects, funders, peers and end users learn about your work?
- What are your plans for recruitment, enrollment and retention?




Distribution




- Research Design?
- Where will the research be conducted?
 - Lab, field study, CBPR, point of care, etc
- What is your dissemination plan?
 - Journal outlets?
- What is your plan for translation, implementation, commercialization, etc?



Revenue





- Funding sources
 - Federal grants
 - Foundations
 - Fee-for-service
 - Industry-sponsored
 - Intramural funding





Startup Needs

- Non-recurring costs
 - Lab space, equipment, recruitment incentives, technology
- Costs for pilot studies


Costs

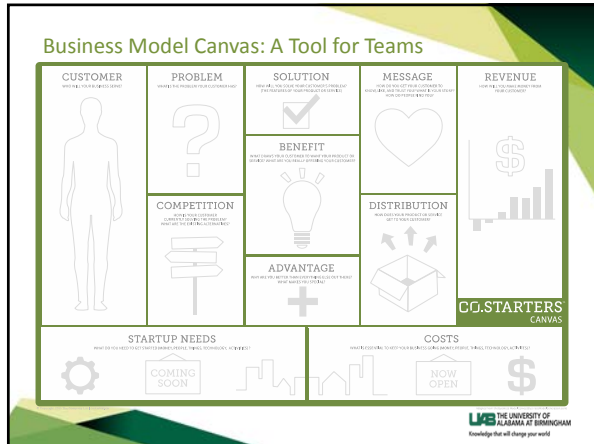
- Ongoing costs once the study begins
 - Space rental, salary support, supplies
- Direct/indirect costs
- Time
- Emotional Energy

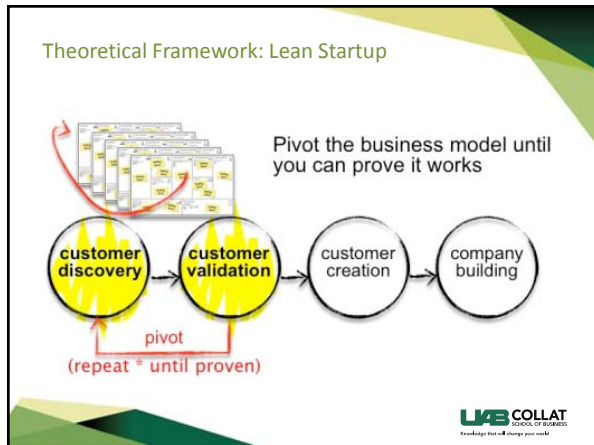
Performance Evaluation

- Holding strategic planning retreats/kickoffs
- Project management
- Quarterly/Annual review
- Documenting activity
- Monitoring progress towards stated objectives
- Making corrective adjustments as needed
- Vision casting for next Q/Y





- ### 12 Potential Sources of Business Model Innovation Conflicts (Blank, 2013; Osterwalder & Pigneur, 2010)
1. Customer
 2. Problem
 3. Competition
 4. Solution
 5. Benefit
 6. Advantage
 7. Message
 8. Distribution
 9. Revenue
 10. Startup Needs
 11. Costs
 12. Evaluation



- ### Challenges associated with team science
- High membership diversity
 - Deep knowledge integration
 - Large size
 - Misaligned goals
 - Permeable boundaries
 - Geographic dispersion
 - High task interdependence
-

- ### Recommendations for enhancing team science: Focus on promoting team processes Table 3-1
- Team Conflict
 - Psychological Safety
 - Transactive Memory
 - Team Climate
 - Team Mental Models
 - Cognitive Team Interaction
 - Team Cohesion
 - Team Efficacy
-

Transactive Memory Systems (TMS)- Mental Model of Tasks, Expertise and People

Tasks	Expertise	People

Transactive Memory Systems (TMS)- Mental Model of Tasks, Expertise and People

Tasks	Expertise	People
Grantsmanship	??	Susan
Multi-level analysis	Biostats	??
Comm Organizing	Church Leader	??
??	Health Disparities	Karen
Publish	??	John
Health Screenings	Clinician	Chris
Qualitative Surveys	CBPR	??

Brandon, D. P., & Hollingshead, A. B. (2004). Transactive Memory Systems in Organizations: Matching Tasks, Expertise, and People. *Organization Science*, 15(6), 633-644. doi:10.1287/orsc.1040.0069

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Recommendations: 10-Step Collaboration Planning (Hall et al., 2014)

1. Rationale for Team Approach and Configuration
2. Collaboration Readiness
3. Technological Readiness
4. Team Functioning
5. Communication and Coordination

Hall, K., Crowston, K., & Vogel, A. (2014). How to Write a Collaboration Plan. *Team Science Toolkit*. Retrieved from <https://www.teamsciencetoolkit.cancer.gov/public/T5ResourceBiblio.aspx?tid=3&id=3112>

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Recommendations: 10-Step Collaboration Planning (Hall et al., 2014)

6. Leadership, Management and Administration
7. Conflict Prevention and Management
8. Training
9. Quality Improvement Activities
10. Budget/Resource Allocation

Hall, K., Crowston, K., & Vogel, A. (2014). How to Write a Collaboration Plan. *Team Science Toolkit*. Retrieved from <https://www.teamsciencetoolkit.cancer.gov/public/T5ResourceBiblio.aspx?tid=3&id=3112>

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On-Campus Resources for Team Work

1. PhD Prep Lab (Evaluation and Assessment, Continuing Education, Professional Development, Strategic Planning Retreats, Kickoff Meetings, Grant Writing, etc)
2. Collat School of Business (Courses in Strategy, Innovation, Leadership, Entrepreneurship)
3. iLab at Innovation Depot (Event Hosting, Co-working Space, Interns, etc)
4. Edge of Chaos (4th Floor of Lister-Hill Library)
5. AHRQ's TeamSTEPS (Strategies and Tools to Enhance Performance and Patient Safety)
6. CO.STARTERS.co

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On-Campus Resources for Team Work

7. Health Care Leadership Academy (Grant Savage and David Rogers)
8. UAB Quality Enhancement Plan (QEP) - Learning in a Team Environment
9. UAB Office of Interprofessional Simulation for Innovative Clinical Practice
10. UAB Organizational Learning and Development (7 Habits, Crucial Conversations, etc)
11. CCTS – see especially [Research Commons](#), [TIERS](#)

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The Science of Team Science: Resources

- How to write a [collaboration plan](#) <https://www.teamsciencetoolkit.cancer.gov>
- COALESCE - CTSA Online Assistance for Leveraging the Science of Collaborative Effort ([teamscience.net](#))
- Collaboration and Team Science: A Field Guide ([teamscience.nih.gov](#))
- CTSA Clinical & Translational Science Awards ([ctsacentral.org](#))
- Northwestern University Clinical and Translational Sciences (NUCATS) Institute (www.scienceofteamscience.org/scits-a-team-science-resources)

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The *Business* of Team Science: Resources

- Alabama Launchpad Competition alabamalaunchpad.com
- Blank, S. (2013, May). Why the lean startup changes everything. *Harvard Business Review*, 3-9. <https://archive.harvardbusiness.org/cla/web/pl/product.seam?c=29512&i=29514&cs=72931baa3b05f76aca8090b33db139bb0>
- Business Model Innovation businessmodelgeneration.com/canvas
- How to Build a Startup udacity.com/course/ep245 (Free Course)
- National Science Foundation Innovation Corps Program nsf.gov/i-corps



Questions?

