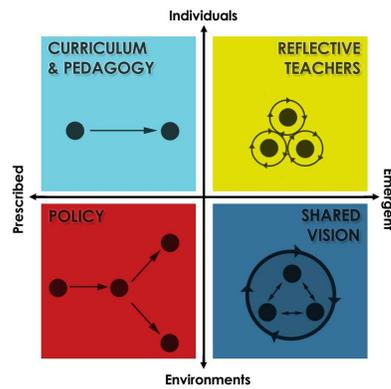


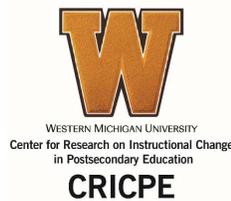
# Using Complexity Leadership Theory to Plan for Emergent Change



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<http://wmich.edu/changeresearch>

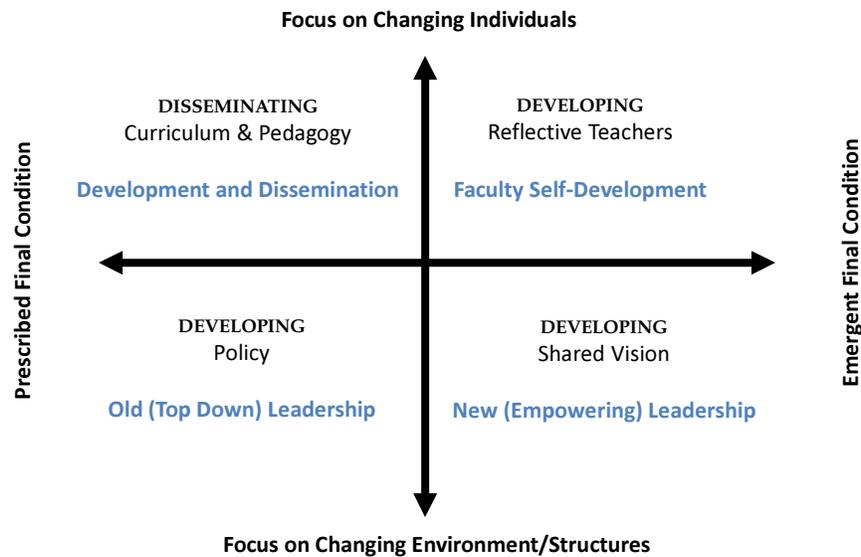


SMTI 2015 National Conference

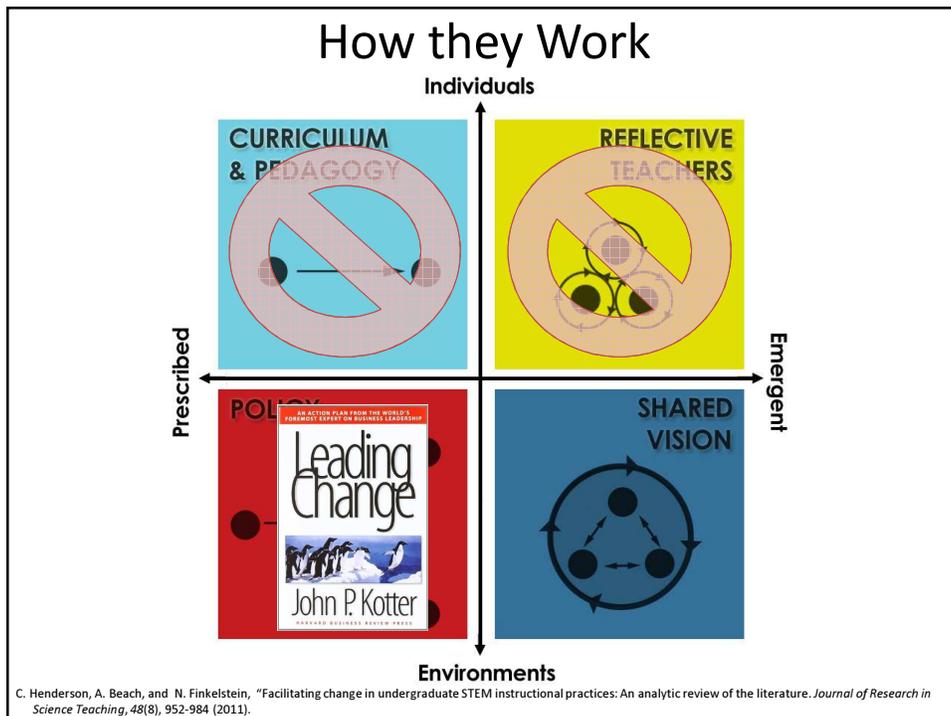
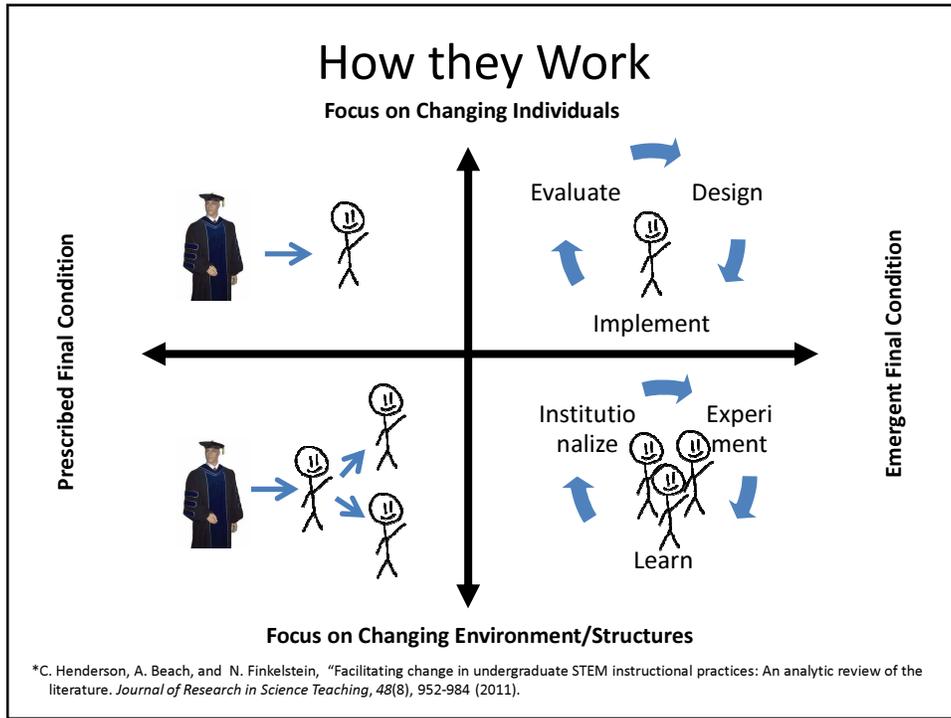
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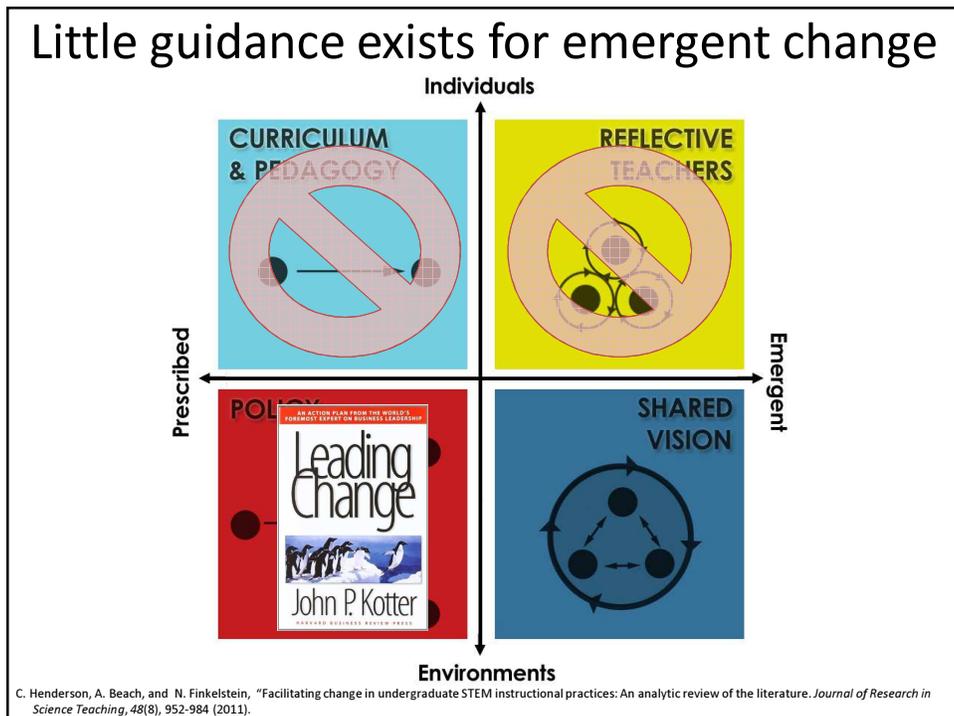
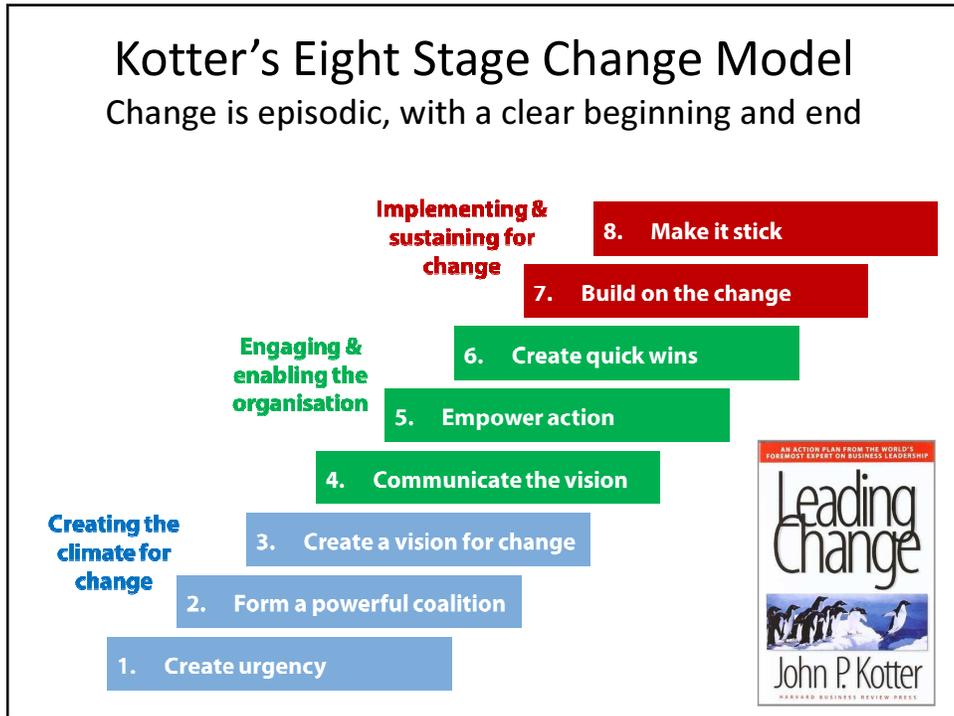
New Orleans

## Four Categories of Change Strategies

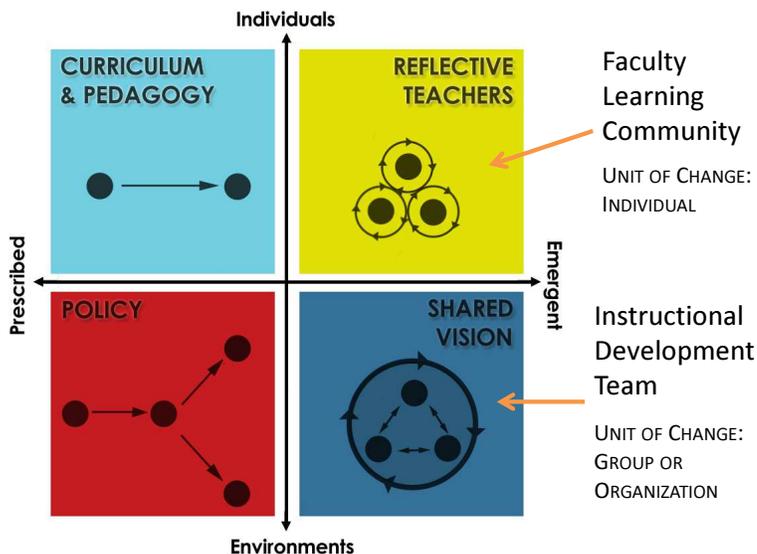


\*C. Henderson, A. Beach, and N. Finkelstein, "Facilitating change in undergraduate STEM instructional practices: An analytic review of the literature." *Journal of Research in Science Teaching*, 48(8), 952-984 (2011).





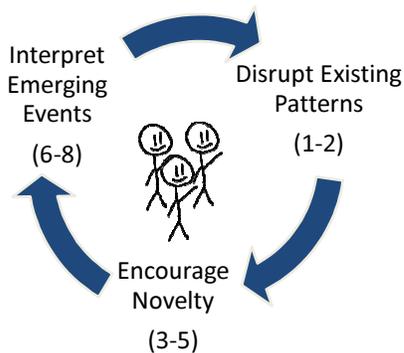
Groups are a common feature of both reflective teachers and shared vision, but serve different purposes in each case.



## Complexity Leadership Theory

Change is cyclic and ongoing

Complexity Leadership Theory's Enabling Leadership (Uhl-Bien et al., 2007)
Change is cyclic and ongoing
1. Disrupting patterns to encourage interactions between individuals
2. Developing rules that create interdependency to encourage teamwork
3. Encouraging dissenting opinions to increase tension
4. Avoiding stifling regulations
5. Articulating the vision
6. Identifying emerging knowledge from interactions
7. Communicating emerging knowledge to formal leadership
8. Implementing knowledge



Borrego, M., & Henderson, C. (2014). Increasing the Use of Evidence-Based Teaching in STEM Higher Education: A Comparison of Eight Change Strategies. *Journal of Engineering Education*, 103(2), 220–252. doi:10.1002/jee.20040

Quardokus, K. (2014). Unpublished Doctoral Dissertation.

## Changing Teaching Practices from a Complexity Leadership Perspective

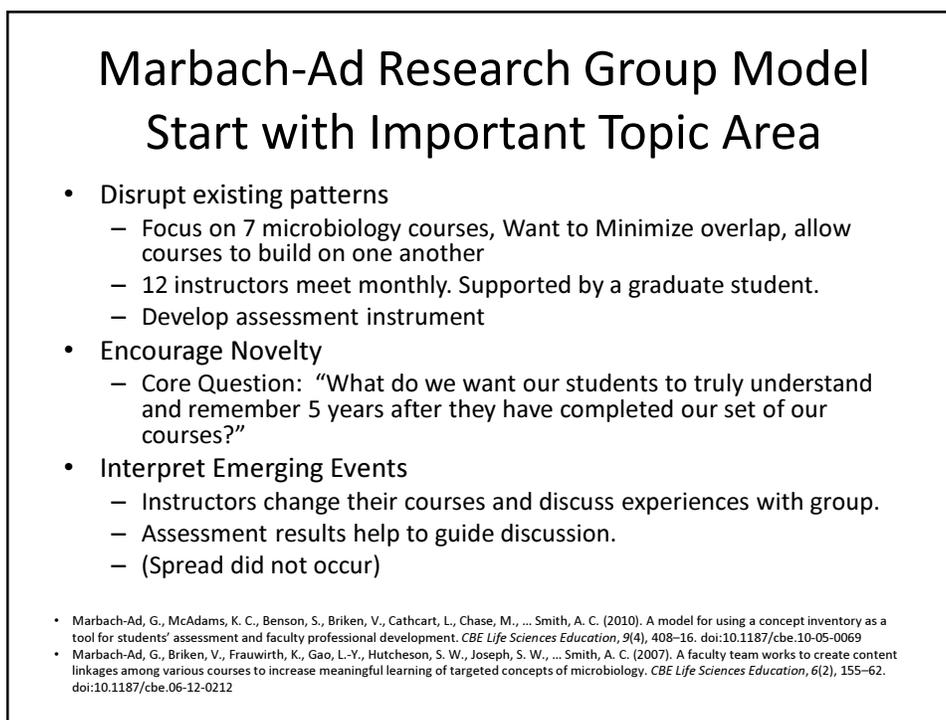
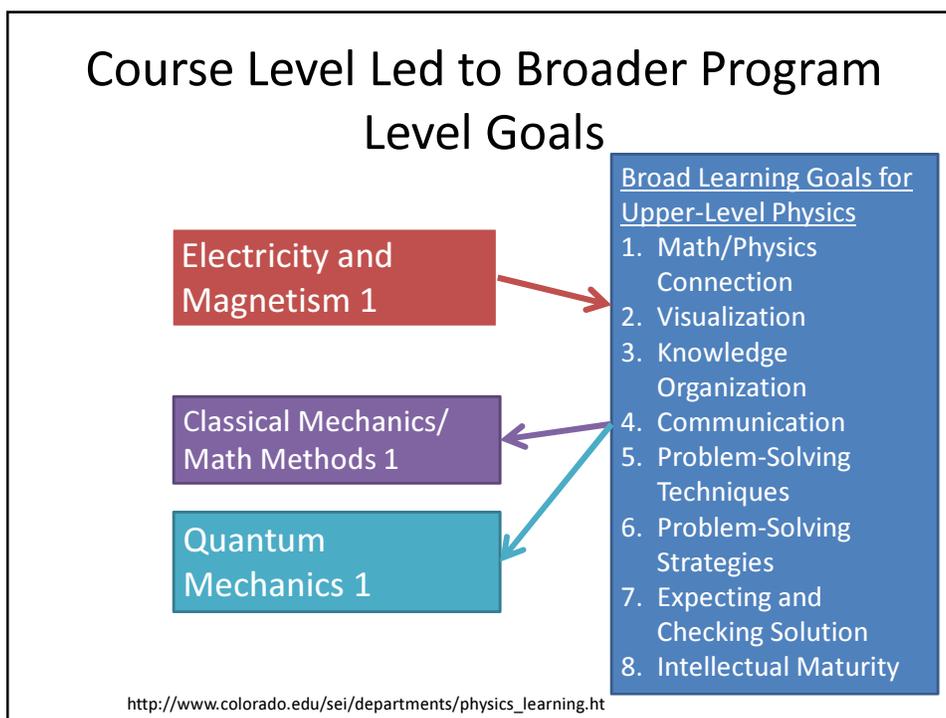
### Three Examples

- CU Boulder (Wieman Course Transformation Model)
- U of Maryland College Park (Marbach-Ad Research Group Model)
- Iowa State University (Ogilvie Learning Community Model)

## Wieman Course Transformation Model Course Level → Program Level

- Disrupt existing patterns
  - Start with focus on upper-division E&M course. 13 instructors met 7 times to set goals. Significant support by post doc.
  - Developed an assessment instrument
- Encourage Novelty
  - Core Question: “What is junior E&M1 about? How is it different from the introductory E&M course?”
- Interpret Emerging Events
  - Significant “behind the scenes” work by post docs and others to synthesize ideas and report back to larger group
  - Course level led to broader program level goals (and shared language in the department)

Chasteen, S. V., Pepper, R. E., Caballero, M. D., Pollock, S. J., & Perkins, K. K. (2012). Colorado Upper-Division Electrostatics diagnostic: A conceptual assessment for the junior level. *Physical Review Special Topics - Physics Education Research*, 8(2), 020108.



## Iowa State University Learning Community Model

- Disrupt existing patterns
  - Focus on 5 science departments to improve 1st and 2nd-year science courses
  - Four Learning Communities (LCs)
  - In successful department: new faculty assignments, co-teaching
- Encourage Novelty
  - Simple Message: “students should do science in the first two years of college”
  - In successful LC: faculty teaching same large-lecture course
- Interpret Emerging Events
  - Post doc to support LC work (new ideas, time)
  - In successful department: supportive department chair (personal interactions, time in faculty meetings)
  - (Spread did not occur)

## Change Initiatives from a Complexity Leadership Perspective

### Key Features

- Disrupt existing patterns:
  - **Support:** Working groups need support (e.g., post doc or grad student)
  - **Interdependence:** Individuals have a reason to work together (e.g., new course assignment)
- Encourage Novelty
  - **Moderate Diversity:** Groups have some diversity of ideas/experiences, but not so much that it is a barrier
  - **Simple rule:** Work framed by compelling, simple rule or question (e.g., “students should do science in their first two years”)
- Interpret Emerging Events
  - **Facilitation:** interpreting within groups
    - post doc or grad student played an important role
    - Additional one-on-one communication outside of group meetings
  - **Communication:** Spreading ideas outside of groups
    - Shared Language: extracting principles from details

## Complexity Leadership in Action: Broncos FIRST

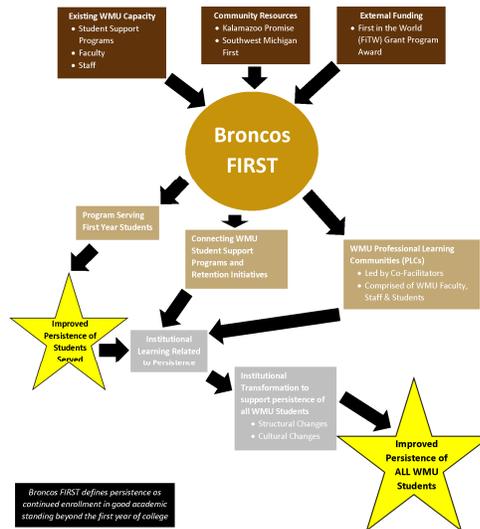
*“What would it mean for institutions to take student retention seriously? It would mean that institutions would stop tinkering at the margins of institutional life and make enhancing student retention the linchpin about which they organize their activities.” (Tinto, 2012, p. 116)*

## Complexity Leadership in Action: Broncos FIRST

In 2014, WMU was awarded a \$3.2 million grant by the DoE First in the World program to promote and study institutional transformation towards improving student success (defined as progress towards graduation).

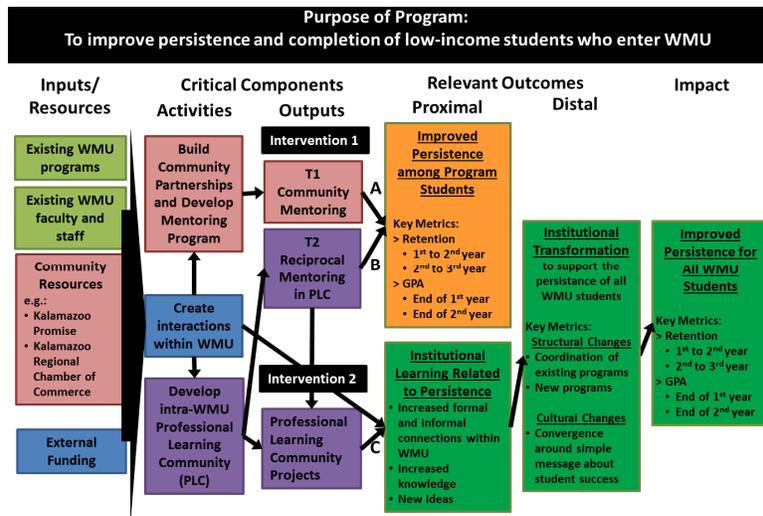
*Through a collaborative change model that involves optimizing and coordinating current institutional efforts as well as promoting cultural change through Professional Learning Communities (PLCs).*

## Broncos FIRST Overall Model



We planned the project from inception as an emergent change initiative shaped by Complexity Leadership principles.

## Broncos FIRST Logic Model



## Disrupt Existing Patterns

- Fundamentally – using grant to look inward at ourselves rather than outward or at “fixing” specific student groups.
- Process – bringing faculty, staff, administrators and the **students themselves** together to address collaboratively identified issues and challenges.
- Outcomes – not prescribed

## Encourage Novelty

- PLCs are not “directed” – they will co-create their own curriculum and identify issues/questions for projects collaboratively
- Make-up of the PLCs VERY diverse, and include students as experts of their own experiences
- Facilitators trained to foster authentic discussion – including disagreement
- Larger network-building approaches

## Interpret Emerging Events

- The largest line item in the budget is for RESEARCH on our process and on the emerging outcomes of the project.
- We have a direct communication line to the President and Provost, and our advisory board contains key associate deans and administrators who can scale up and institutionalize projects and recommendations

## Determining Results

- It can be difficult to “measure” emergent results – we have multiple approaches to measure change, both quantitative and qualitative.
- Our research design is intensively focused on process and intentionally open to emerging results.

## Questions?

- [www.wmich.edu/changeresearch.com](http://www.wmich.edu/changeresearch.com)