SUMMARY OF RESEARCH DISCUSSION
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[The following notes represent topics discussed regarding the research dimension of transformation in engineering education.]

**Learning community models**

- **What do we know / not know?**
  - Know about campus-wide groups (shared context), don’t know as much about multi-institution groups, don’t know as much about groups of department level groups at the same institution
  - How they work/worked (formation, function, sustaining)?
  - Consortia vs. colonial model (we know best, let me tell you about it)
  - Original change model more of a focused dissemination plan, evolved into local learning communities and development of partnerships
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- Social network that characterizes activities that people belong to which are institutionalized; central people who are involved in multiple links who network others into other activities and other groups that deal with particular issues (e.g., the department resource group) – they are the knowledge management folks who have the knowledge and link people to variety of knowledge that people need to work productively
- Challenges (implementation and research)
- Implementation: Have a network, struggling with how to help them become a learning community
- Implementation: In a small department – if the department itself isn’t “healthy” (disable collaboration)...and it may be a reason to step outside department lines.
- Research: lacking expertise in developing / having a model of change – where is this expertise and how to have that expertise on the team (Sociologists do this! Evaluation professionals do this!)
- Research: Social network analyses - a focus on what people do (they network, share knowledge, etc.) but may not speak to what people understand about teaching / learning / change; provides a historical view and an intervention-view
(making changes to the experience – can see what the outcomes are in terms of how the network grows/evolves).

- Funding: What is the role of funding in growing and sustaining these communities? Research 1 universities are less involved in the network yet may have greater access to funding resources (or do they)?
- What have they achieved?
- Research questions:
  - What are the necessary characteristics of learning community for it to form, grow, survive, and thrive?
  - What kinds of resources for sustaining communities and/or networks? Issues of funding, status and power (teaching having high status vs. low status), culture, beliefs about teaching as “common knowledge” vs. scholarly work, etc.
  - What does a community need to thrive in these kinds of contexts?
  - What makes people want to enter a community, what makes others invite people into a community?
  - How to take strategies from one context and use them in other contexts (e.g., a teaching focused university to a research university)?
  - How does experience within a learning community impact ways of thinking (e.g., sociological ways of thinking)?
  - What “critical mass” needs to be there in building a community – identity, functional discovery, etc. (Christine’s work)?
  - What are the landscapes of learning communities and social networks in which they work best? (Learning communities tend to start small and may not work as well when they get large; social networks tend to work best at a very large scale and may not work as well as a small scale) Related question: How do issues of scale relate to a sense of identity within that community? A desire to have an identity within that community?
  - How does the locus on the status hierarchy influence diffusion? Status here is focused on status of teaching and engagement of “high status” individuals involved in the process (prestigious). Links to the multi-level community structure at the local context.
  - What is the propagation pathways in social networks and how do these different pathways produce different outcomes of transformation?

**Change models**

- See link below regarding “opportunities”
- Research questions
- How do change models evolve over time – and how can this help us understand the change process? (A kind of action research?) (Even if initial change model is somewhat underformed or undertheorized?)
- What is the relationship between what is proposed and what occurred? (Elaine had a better framing and I missed it)
- How does the change in the program from CCLI to TUES impact the proposals they receive and the impacts that emerge?
• What are the relationships between “metacognition” (the change that happens “in” people) and the actions people take (e.g., in collaboration with others, within a social network, how they try to propagate their work)? (This is the link between cognition, social cognition, etc.)
• How to design your project with the intention of change?
• What do people who design for “diffusion” or “transformation” emphasize in their change models?
• What are the elements of the change model, and how do they interact? (which areas are well understood, which are not, and what do we know about the interactions around system elements – meta-analysis of relative weight of elements)
• What would a cross-disciplinary model on change that brings together different (and sometimes competing) views (higher education, sociology, engineering education, engineering, learning science, psychology, etc.)?
• What are frameworks for understanding change – from different perspectives?

Faculty changes around teaching and learning
• Have models for talking about professional development and changes in beliefs in teaching and learning
• Research questions:
  • How faculty understand the connections between how they teach and the impacts they seek or foster (short and long term)?
  • What motivates faculty…..
  • (didn’t have time to keep pushing on this)

Following the innovation – adaption, reinvention
• Charles….(how does reinvention of an “innovation” impact an understanding of teaching and learning – the effort involved in doing this is likely to reveal assumptions, challenge assumptions, etc.)

Strategies, structures, and systems
• Have some knowledge around individual strategies (they work, don’t work)
• Links to strategies around institutional structures and norms
• Research question:
  • What would it mean to combine strategies – how does the interaction of different strategies work? What comes out? (e.g., learning communities, self-reflection, and structural effort)
  • How do unstated norms influence the change process? What are they and why do they have that kind of influence? (statements on SoTL = research as official college policy, some ignored and some emphasized it, some efforts on part of people in power to make sure official policies are enacted in real ways)
  • What can we learn from cases that have influenced institutional structures and norms?
• How does the reward structure work? What is underlying beliefs about opportunities to change reward systems? [link to Higher Education research community]

Opportunities
• Where is “change” on the national agenda – do we not see this as research? Is the focus not something of value in funding agendas?
• Strategy: If you want funding, you have to perceive of yourself as a “collective” (e.g., working practitioner community) – has to be collaborative, not individual. Is this another way of saying – if you want funding you need to establish how you are going to impact broadly – not just that you will (e.g., broader impact statement), but HOW (define your unit of change, method of change, etc.).
• Strategy: $50k reward for including a community college – what do we know about that?
• Strategy: NSF RFPs requiring a statement on your change model – link to Broader Impact statement – move away from “embedded change model” – and provide evidence of it in your proposal
• A statement of why you are proposing what you are
• This then becomes it’s own unit of analyses that is researchable – in what ways does this “strategy” influence change
• Evaluation plan – logic models – evaluation becomes a collaboration not an activity separate from program design. The way they are written now suggests they are written at the end which suggests that there is not a connection between what the proposal seeks to achieve and what it means to achieve this. Are we shortcutting evaluation – and yet expecting high hopes from this? How might the inclusion of a change model and more stringent criteria on ‘impact’ change the role of evaluators in developing a proposal.
• Dissemination plan – to what extent are there efforts to disseminate to “users” in useful ways?
• Providing a sourcebook (e.g., how to do program evaluation) that provides a primer and link to resources on what it means to have a change model and how to create one
• A thought (after our conversation) – perhaps this should be in all RFPs (particularly those focused on discovery in the disciplines) – could this be a change model in itself – if we are ALL responsible for thinking about the ways we want our work to have an impact – thinking about impact in educational settings should have equal value as thinking about impact in research lab settings. This is what it means to be a professional…
• Resources to consider as part of the grant writing template