

# Emerging E-learning Theories and Ideas

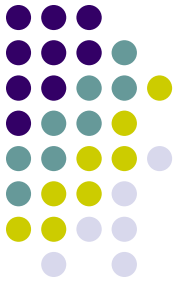
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# Emerging Approaches to E-learning

## Emerging Theories and Ideas

- Theories
  - Emerging from the change in practices associated with e-learning
  - Merging with theories from outside education
  - Influenced by social and technical changes in how, when, and for what reasons we learn online
- Approaches
  - To teaching and learning
  - To research on teaching and learning



## Some Theories and Approaches

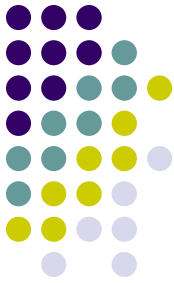
### Emerging Theories and Ideas

#### Learning

- Collaborative Learning
- Learning Communities
- Online-Offline Synergies
- Learning Networks
- Persistent Conversation
- Mobile Learning\*
- Ubiquitous Learning\*
- \* not covered yet

#### Other Areas

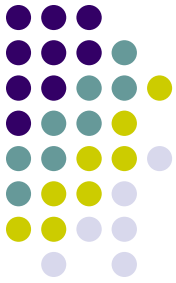
- Group development
- Group behavior
- Community
- Social Networks
- Internet Research



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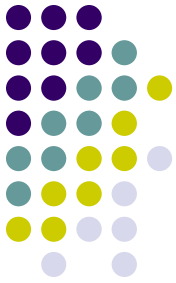
*Emerging Theories and Ideas*

- Collaborative Learning
  - Collaboration (Critical mass, altruistic behavior)
  - Computer-supported collaborative learning, CSCW
  - Learner-leaders
  - Knowledge construction / co-construction (adult learners, experts)
- Learning Communities
  - Virtual community
  - Group behavior, group learning (temporal, group maintenance)
  - Community of practice
- Online-Offline synergies -- Community-embedded learners
- Learning networks -- Social network ties and relations
- Conversation: Persistent conversation; Interactivity
- M-learning, Mobile Learning
- Ubiquitous Learning



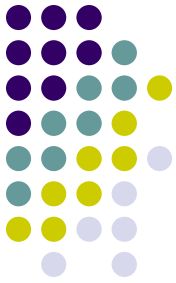
# Collaboration

- Why collaboration?
  - Social aspect of learning
  - Can do more with groups than alone
  - To deal with the amount of interaction in an online class
- Research on working and learning together face-to-face and at a distance that covers collaboration
  - Distributed knowledge, distributed cognition
  - Teamwork
  - Group and organizational behavior
  - Scientific collaboration
  - Interdisciplinary collaboration



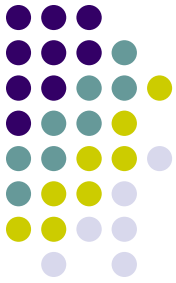
# Collaborative Behaviors

- Getting an information group going requires
  - *Critical mass* of contributors and contributions
  - Leaders who start by contributing more than they get in return (altruistic contribution)
  - Trust in how contributions will be used
  - Reward and recognition for contributions
    - Rewards of types appropriate to the contributors
- E-learning
  - Learner-leaders (Montague)
    - Take on role of giving help to others
  - E-facilitators or “braiders” (Preston)
    - Work with the ideas presented to synthesize and promote further debate and clarification



# Stages of Group Development

- Stages of Development
  - “Forming, storming, and norming” (Tuckman)
- Group processes (McGrath)
  - *Generate* ideas, alternatives, plans
  - *Choose* correct or preferred option from alternatives
  - *Negotiate* in the face of conflicting views and interests
  - *Execute* the work in the face of competition or with respect to some standard
- Group formation in **e-learning**
  - Coming together, maintaining presence online, and disengaging from the online world (Haythornthwaite, Kazmer, Robins, and Shoemaker)

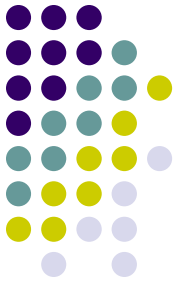


# Group Knowledge Development

## Emerging Theories and Ideas

- Creating a common understanding of goals, processes, practices
- Knowledge
  - Explicit knowledge, e.g., what is written down
    - Subject knowledge, disciplinary knowledge
  - Tacit knowledge, e.g., knowing how to do something
    - Practice knowledge, how to behave, how to be a member of a profession *and* how to use technology
- Practice knowledge **in e-learning**
  - How to learn collaboratively
  - How to work together with and through technologies
  - For all ages, collaborative learning is more like adult learning
    - self-directed, internal motivations, joint construction of ideas and plans, adoption of leader and integrator roles (Montague; Preston)

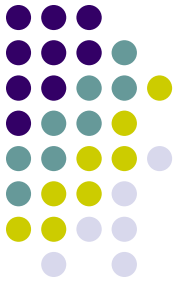




# Collaborative Learning

## Emerging Theories and Ideas

- Benefits
  - Active construction of knowledge, enhanced problem articulation, peer-to-peer information sharing, trying ideas out on others
  - Exposure to ideas and opinions of others
- Need for **learning**
  - Environment where individuals feel safe in expressing their unformed ideas (Bruffee)
  - “The goal of the collaboration is to create a **community of inquiry** where students are fully engaged in collaboratively constructing meaningful and worthwhile knowledge” (Garrison)



# Collaborative Learning

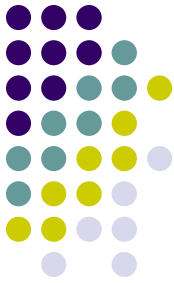
- Networks and learning
  - New ideas come from those we do not know well -- our **weak ties** in social network terms
    - But, these people are not motivated to share information with us, or to help us complete our work
  - Commitment to joint work comes from those we know well and trust -- our **strong ties** in social network terms
    - Thus, **e-learning** settings also need to support strong tie formation in order to get work done (Haythornthwaite, 2002)



# Community

## Emerging Theories and Ideas

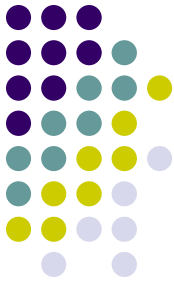
- Community Lost
  - Lament for the passing of the **village ideal** of community, considered lost in urbanization
- Community Saved
  - Rediscovery or local community in the towers of urban living
- Liberated / Networked Community (Wellman)
  - Based on the concept of social networks with a focus on social connections rather than geographic co-location
  - Place independent, liberated from geography
  - Based on **personal communities** sustained through communication and travel
- Online / Virtual
  - Liberated from geography, dependent on technology



# Learning Communities

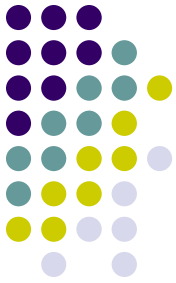
## Emerging Theories and Ideas

- Community of Practice (CoP)
  - Common area of work, primary focus on practices
- Community of Inquiry
  - Common area of discovery
  - Engagement in “collaboratively constructing meaningful and worthwhile knowledge” (Garrison, 2005)
- Knowledge Community
  - Common knowledge, specific expertise
  - Knowledge distinguishes experts from novices, members from non-members
- Discourse Community
  - Common genres, communications with particular purpose and form
  - Community members use rule-based and conventionalized means to accomplish social goals, e.g., greeting rituals, letters, genres of online conversation
  - Knowledge and correct use of genres signifies membership



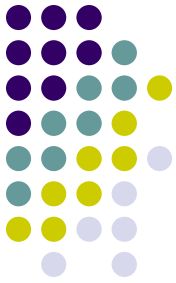
# Community Attributes

- Bonding and culture (shared identity)
  - “First, it is a web of affect-laden relationships that encompasses a group of individuals - relationships that crisscross and reinforce one another, rather than simply a chain of one-on-one relationships. ... referred to as **bonding**.  
Second, a community requires a measure of commitment to a set of shared values, mores, meanings, and a shared historical identity—in short, a **culture**.” (Etzioni & Etzioni, 1999, p. 241)
- Communities of Practice
  - **Mutual engagement, a joint enterprise, and a shared repertoire** (Wenger, 1998)
    - i.e., shared routines, vocabulary, and concepts
- Social Capital
  - **Bridging** (weak ties) and **bonding** ties (strong ties) that provide support and create value in the network (Putnam; Lin)



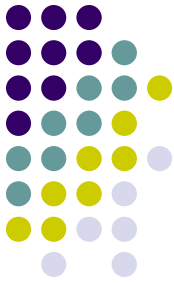
# Virtual Communities

- Rediscovery of community attributes
  - Common language online (e.g., emoticons, acronyms, short message text)
  - Hierarchy and roles (newbie, wizard, trolls, hackers)
  - Maintaining control of the community, e.g., keeping discussion on topic
  - Rituals
  - Shared history
  - Known rules of behavior
    - e.g, Frequently Asked Questions (FAQ) lists
  - *Sociotechnical* capital (Resnick)



# Virtual Communities

- Rediscovery on the importance and relationship with place
  - Online interaction supporting offline geographically dependent communities (Hagar)
  - Online interaction and engagement go hand-in-hand with overall civic engagement (Kavanaugh, “Blacksburg Village”)
  - **E-learning** in communities supports and interacts with community
    - Community-embedded learners (Kazmer)
  - *Community informatics*
    - Using information and communication technologies to improve communities

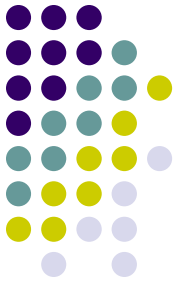


# New E-Learning Research Questions

## Emerging Theories and Ideas

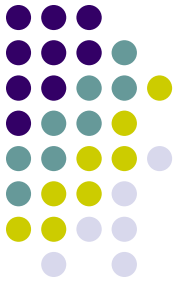
- Learning
  - What does collaboration or active learning look like in an e-learning context? How can we see it when all we have is streams of text?
  - What level of interactivity among students is the right amount?
  - Can we 'see' learning in the stored text?
- Student Experience
  - How can we tell if there is a 'community' among students? What do we look for to see if social conditions are producing the right kind of interaction?
- Class Management
  - What kinds of feedback do instructors need to understand class dynamics?
- Systems Development
  - What needs to be added to e-learning systems to provide more information on social, educational, and learning interactions?
- Technologies
  - How will mobile devices affect learning and e-learning efforts? (M-learning or Mobile learning)
  - How has the Internet encouraged anytime, anywhere learning and how will this affect who we learn from (Ubiquitous learning)





## Research Issues

- Learning from E-Learning Transcripts
  - What follows considers how to learn more about e-learning environments from the text transcripts that are left behind
- My ongoing work
  - Defining measures of interaction online that provide effective feedback for teachers, students, and researchers
  - Discovering measures that indicate social cohesion, learning, emotional response
  - Using automated means to derive social networks of interaction
    - Who talks to whom about what
  - Using visualization to present results in a meaningful way for teachers, students, researchers



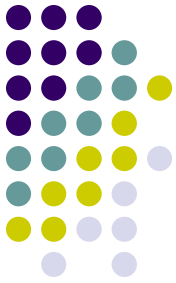
## Persistent Conversation

- Talk that leaves a trace, a record
  - Email, Chat, Blogs, Texting
- Creates a record
  - Text (+ audio, video)
  - Social network information
  - Content information
  - Emotional information
  - Learning information
- How can we use these records to enhance feedback to teachers and students in e-learning settings



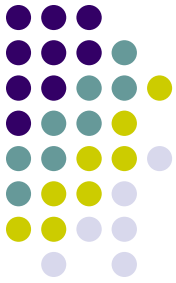
# Visualization of Online Conversations

- Substantive Problem
  - Linear presentations of conversations as text
  - Lack of non-verbal information and feedback
    - sounds, spatial arrangement, eye contact
  - Synchronous exchanges and need for monitoring, intervention, feedback
  - Asynchronous exchanges and their weight of text



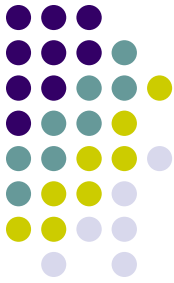
# Theoretical Problems

- Data visualization versus scientific visualization
  - **What** to visualize, not just how to implement a known standard
- Quick views versus research views
  - Ex., instrument panels for simultaneous monitoring and reacting OR after-the-fact examination
- Hierarchies of views
  - Top views vs “drill-down” views
  - What data to show at the surface, what to show a click away
- Single versus multiple modalities
  - Tracking conversations across email, chat, audio, phone, face-to-face



## What to Visualize

- Social network information, e.g.,
  - Who is talking to Whom?
  - Who is present, who is talking, who is \*not\* talking, how encompassing is the conversational activity?
- Conversation content
  - What are people talking about?
    - How much do they talk? How often?
- Social Network x Content
  - Who is talking to whom about what? Who is dominating what conversations?
- Media Use
  - Who is talking to whom about what and via which media?

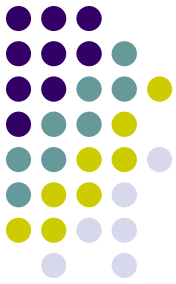


# Visualizations of an IRC chat

```
*** mxxxxr is now known as Louise
*** erinid has joined #lis380lea
*** spxxxxxx has joined #lis380lea
*** spxxxxxx is now known as Rita
*** Kim has joined #lis380lea
*** kxxxx has joined #lis380lea
[erinid] hello everyone. how is everyone? it is the most perfect fall day here in Chicago
(great day for being outside!).
[Rita] Good morning. Is anyone else having trouble with "ghost posts" on the bulletin
boards? How frustrating.
*** scxxxxxx has joined #lis380lea
*** kxxxx is now known as Dora
[erinid] How do you mean, Rita? You post and nothing shows up?
*** sxxxxxx is now known as Irene
[Robin] It's lovely and windy here...one of my favorite kind of fall days. :) And the leaves
are covering the ground, all fall-colored and beautiful
[Cate] Hi Erin. No big winds today?
[barb] rita --yes! i've had so many posts that don't show up
*** kxxxxxxx has joined #lis380lea
*** cxxxxxxx is now known as Pat
[erinid] no big winds! just blue sky, sunny, 60 degrees or something.
*** jo has joined #lis380lea
[Dora] It is -10o here in Alaska. Brrr!
[Norma] 80 in sunny Anchorage
[Rita] Hi Erin. Yep, that's it! Oh, well. Glad Chicago is beautiful today. We had a silver
frost this morning in Portland--our 1st.
*** lxxxxxxx has joined #lis380lea
*** jxxxxx has joined #lis380lea
.....
```

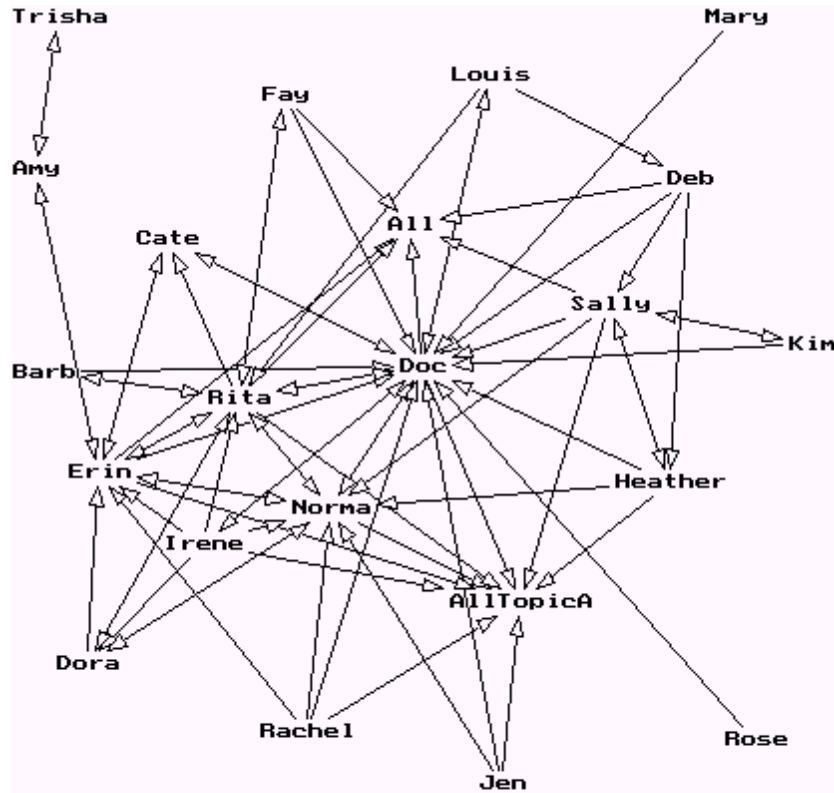
## Note:

- names as 'glue' connecting conversations
- name variation for same person
- name repetition for different people
- conversations to a named other
- conversation to unnamed subgroups
- conversation to unnamed whole group



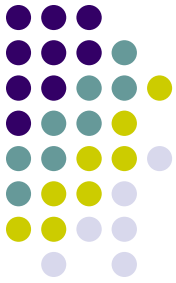
# Visualizations: Pre-class chat Who is Talking to Whom

Emerging Theories and Ideas



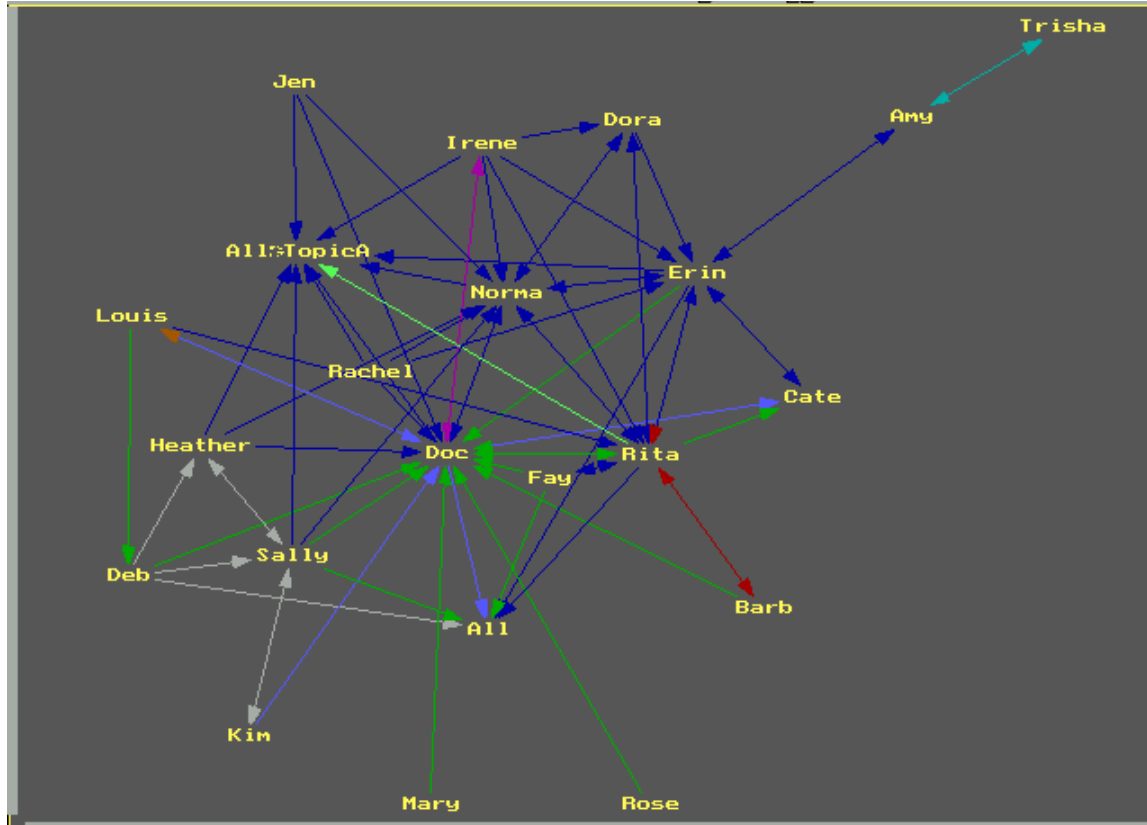
## ISSUES:

“All” and “AllTopicA” --  
are constructs;  
Shows no conversational  
threads



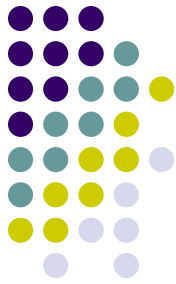
# Who is Talking to Whom by Conversation

Emerging Theories and Ideas



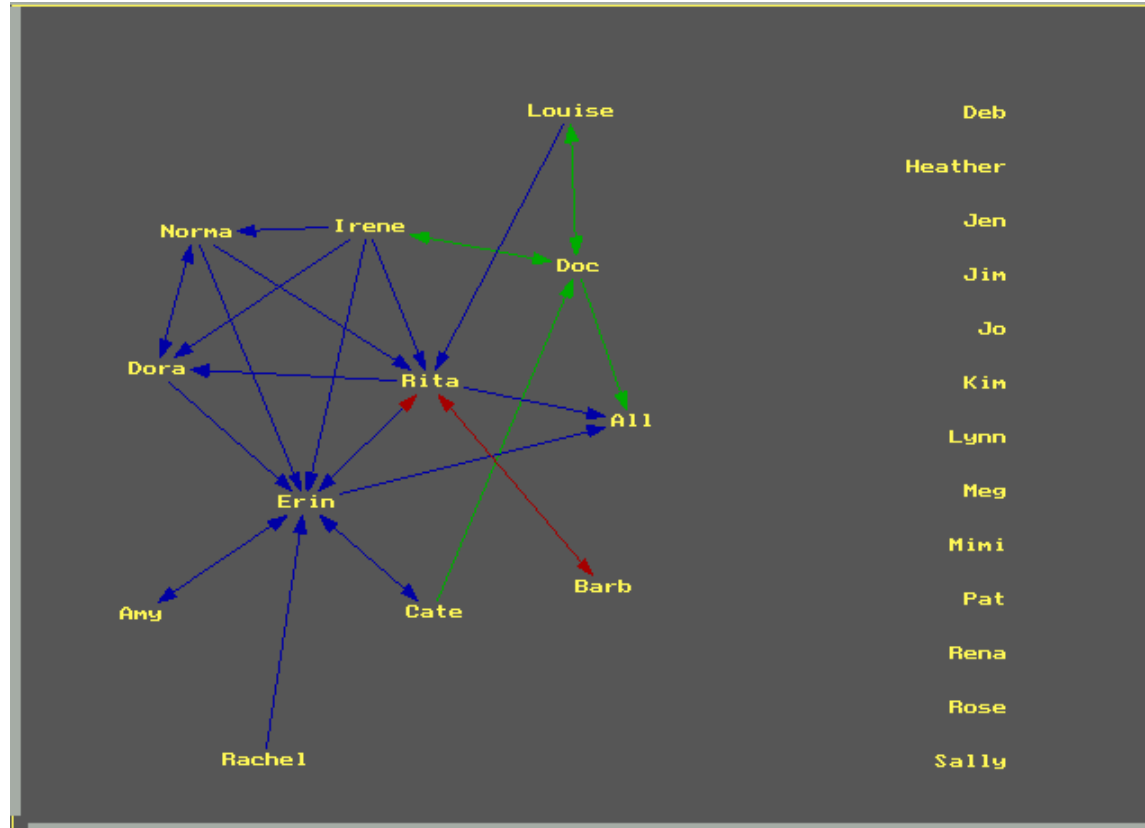
ISSUES: Shows conversational threads but all on top of each other for the whole time period; doesn't show non-talkers



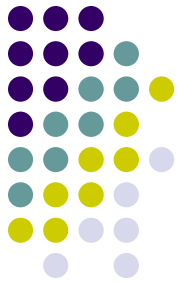


# Who is Talking and Not Talking by Conversation: Time 1

Emerging Theories and Ideas

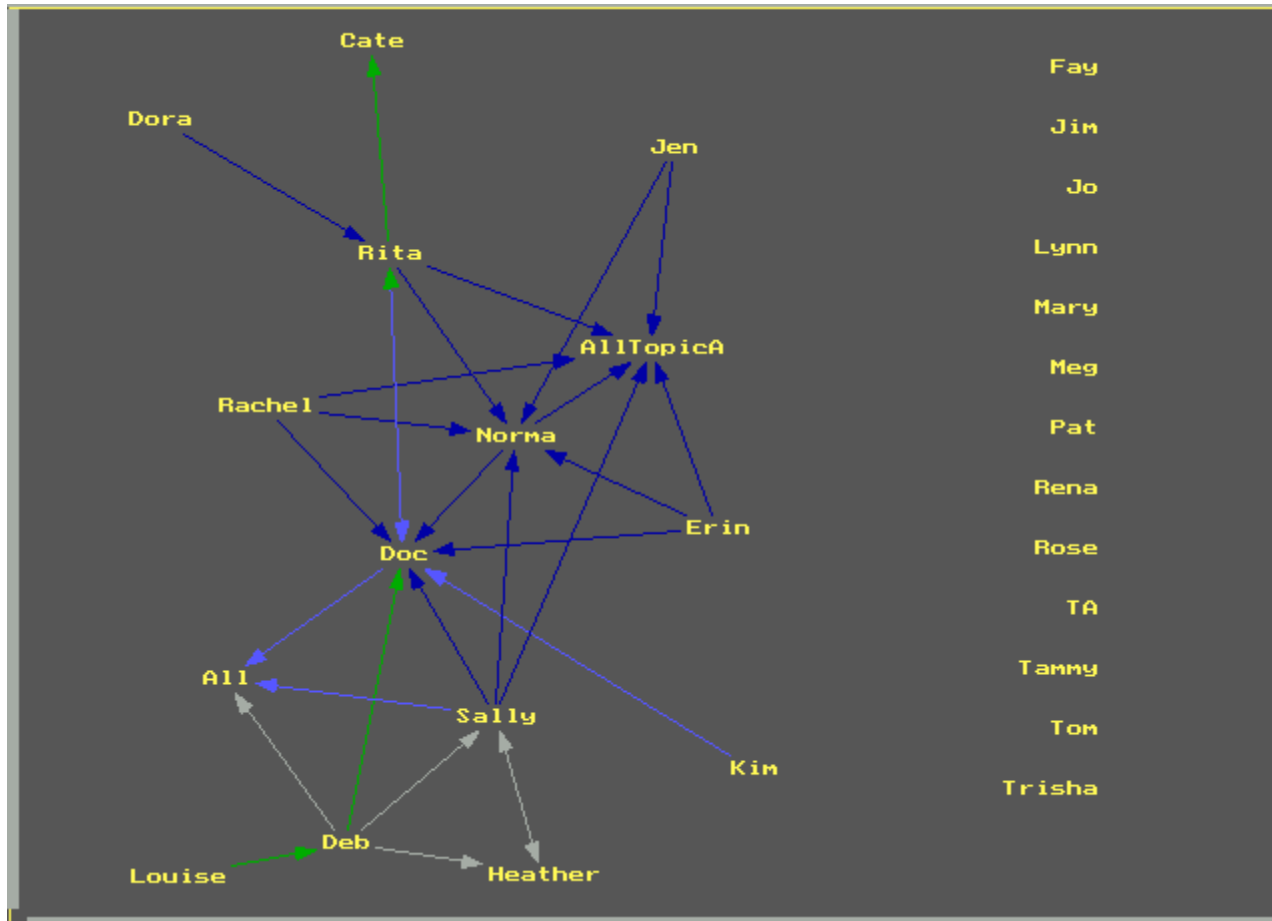


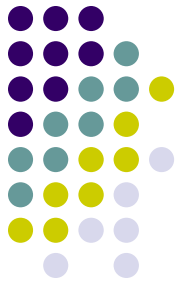
ISSUES: shows conversational threads (max. 2), non-talkers, during first third of pre-class period. Conversational threads here determined manually -- **how to automate?**



# Who is Talking and Not Talking by Conversation: Time 2

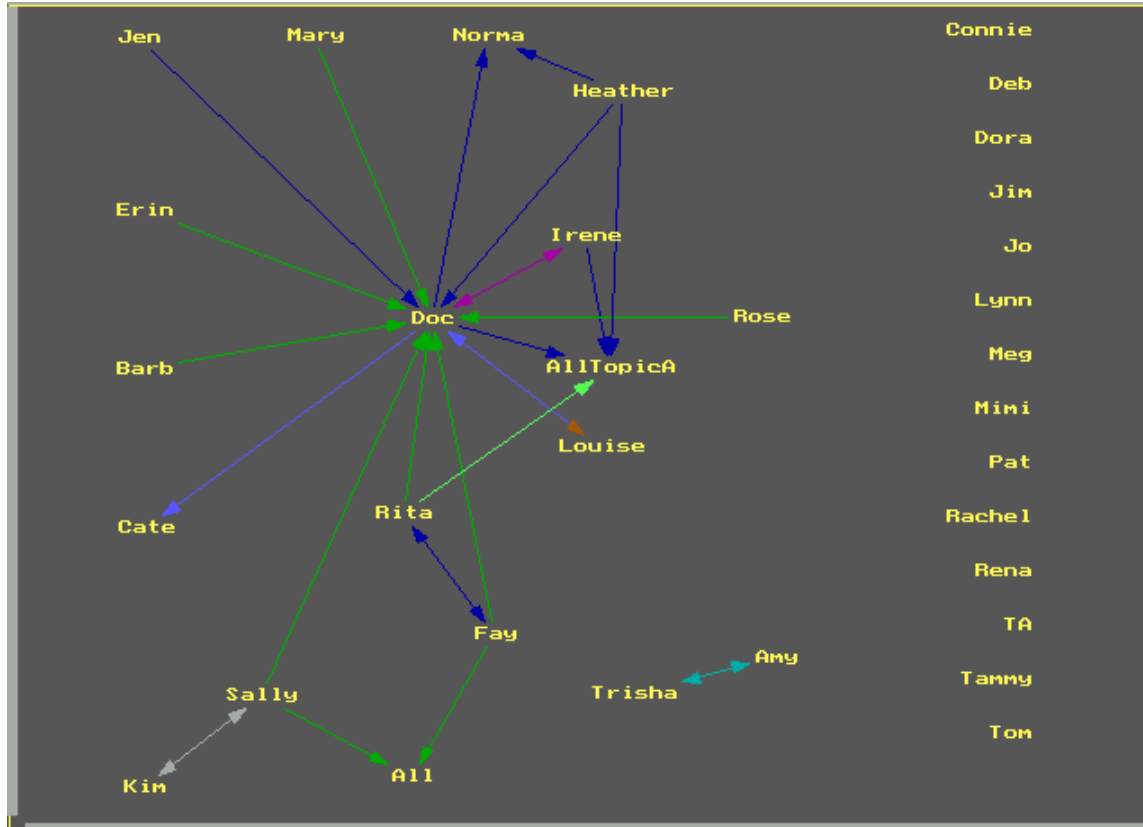
Emerging Theories and Ideas



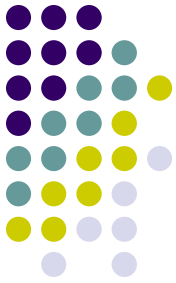


# Who is Talking and Not Talking by Conversation: Time 3

Emerging Theories and Ideas

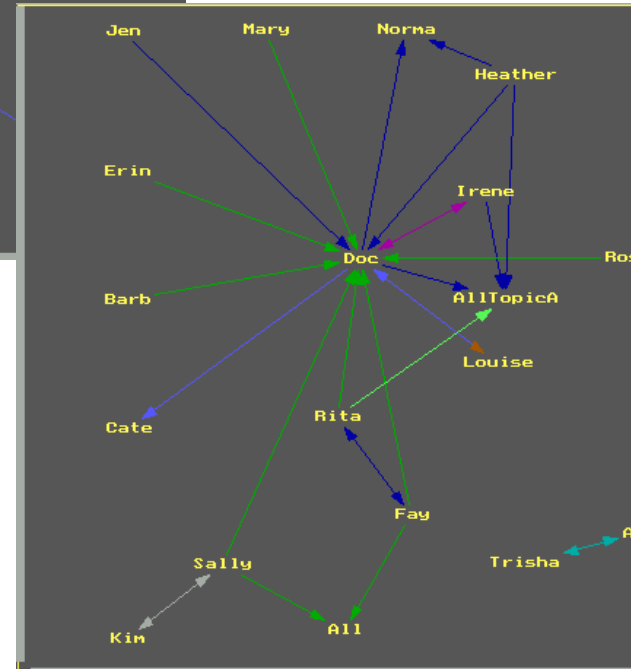
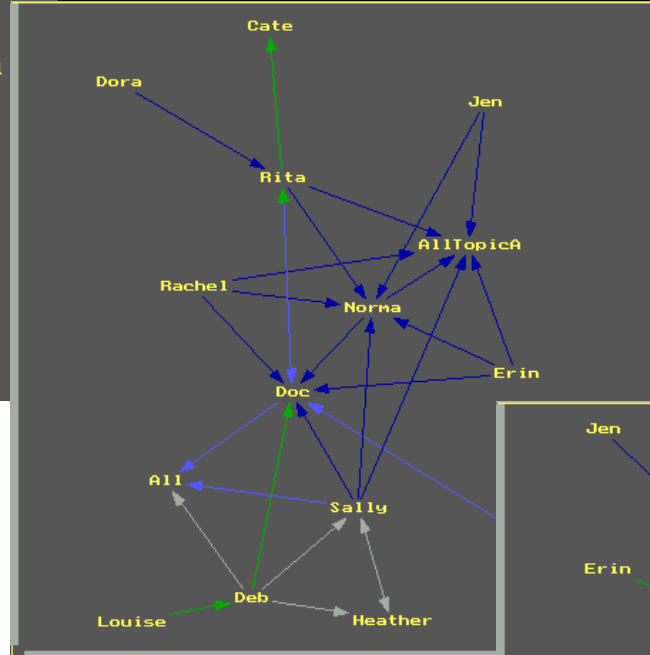
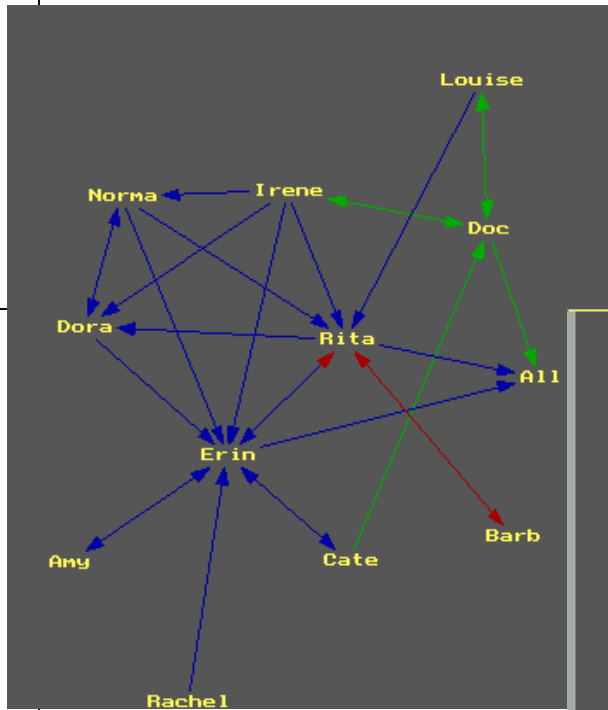


ISSUES: the three slides show conversational movement over time; **What movements confer significance?** -- e.g., changes in number of threads, central talkers, number of non-talkers, density of talk network?



Emerging Theories and Ideas

# Multiple Views



Issue: How to relate one picture to another? How to visualize so the desired information can be easily interpreted: Keep individuals in the same place? Follow the network



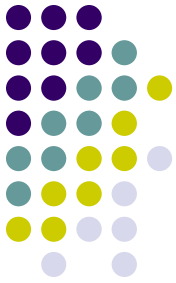
# Tasks Faced in Trying to Visualize Conversations

## Shown **\*\*so few\*\***

- Talk relations: who with whom about what; who is not talking
- New spatial arrangements by conversational location, and location in the conversation
- Change/movement over time
- Whole networks
- One medium (see the position paper for pictures across media and time)
- Small number of time periods and number of speakers

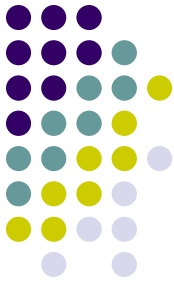
## Not Shown **\*\*so many\*\***

- Listening: whose conversation are non-talkers “listening” to
- Primary vs secondary conversations; content; frequency of interaction
- People: more than names; who they are; who knows what (I know); large n
- History: past associations (ContactMap)
- Cross-media, cross-session coherence
- Ego-centric view



## Summary of Issues

- What's important?
  - What of all the interactions shown and not shown are of importance to instructors and students?
  - What signifies a good learning experience, social experience, development of community, trust, etc.?
  - What can be useful in a “quick view”? What needs to be left for a post-hoc “research” view?
- What network configurations are important?
  - What network characteristics signify an important social effect? What changes matter? E.g., density, networks stars, isolates
- How can we **automate** and present so that the information is easily accessible to teachers and e-learners?
- >> move on to presentation of more recent work <<



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