

# Impact of Anchored Discussion Technology on Collaborative Knowledge Construction

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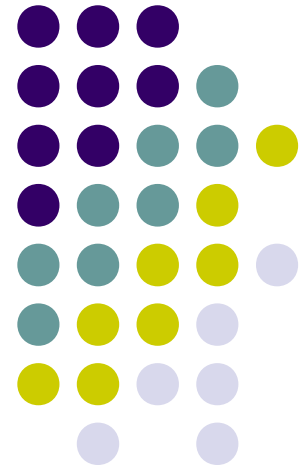
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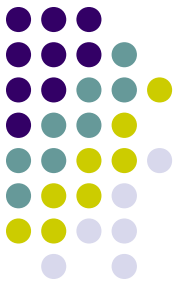
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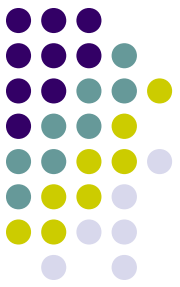




# Agenda

- Core Concepts
  - Collaborative Knowledge Construction
  - Collaborative Learning
  - Discussion
- Research Framework
  - Problem Statement
  - Purpose
  - Anchored Discussion Technology
  - Research Question\Hypotheses
  - Methods: Data Collection and Analysis
- Expected Research Contribution
- Comments & Questions

# Collaborative Knowledge Construction

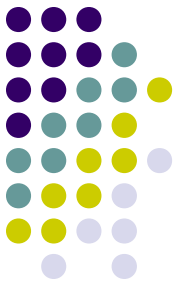


- **Definition:** A process that “takes advantage of the diverse levels of existing expertise among students and their self directed learning skills in order to bring new information to a discussion” [1].
- **Two Fundamental Theories:**
  1. **Distributed Cognition:** Group members can collectively construct new knowledge when they can not achieve the same individually.
  2. **Social Capital:** Group members working collaboratively toward a common goal can achieve more through combining their expertise and knowledge than the same individuals working alone [2].

1-Lee S. and Jefferson T. “The Interplay between Self-Directed Learning and Social Interactions: Collaborative Knowledge Building in Online Problem-Based Discussions”, ICLS 2006, pp. 390-396.

2- Weatherley J., Sumner T., Khoo M., Wright M., and Hoffmann M. “Partnership Reviewing: A Cooperative Approach for Peer Review of Complex Educational Resources”, Proceedings of the 2nd ACM/IEEE-CS joint conference on Digital libraries, pp. 106-114.

# Collaborative Learning



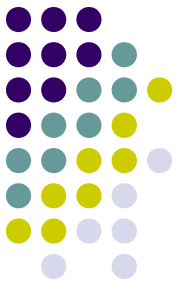
- **Definition:** From a constructivist perspective, it is a pedagogical method that can stimulate students to discuss complex problems from different perspectives [3].
- **Relation to Collaborative Knowledge Construction:** Research views collaborative learning as a process of collaborative knowledge construction because in this process learners elaborate, explain, and evaluate information in order to re and co-construct new knowledge [4,5,6].

3-Veerman, A., & Veldhuis-Diermanse, E. "Collaborative learning through computer-mediated communication in academic education," Proceedings European Perspectives on Computer Supported Collaborative Learning: Euro-CSCL. - Maastricht : Maastricht McLuhan Institute, 2001 - p. 625 - 632.

4-Baker, M. "A Model for Negotiation in Teaching-Learning Dialogues. Journal of Artificial Intelligence in Education, 5(2), 1994, pp. 199-254.

5-Dillenbourg, P., Schneider, D."Mediating the Mechanisms which Make Collaborative Learning Sometimes Effective", International Journal of Educational Telecommunications, 1(2-3), 131-146.

6-Erkens, G. "Cooperative Problem Solving with Computers in Education: Modelling of Cooperative Dialogues for the Design of Intelligent Educational Systems", Utrecht: Brouwer Uithof (1997).

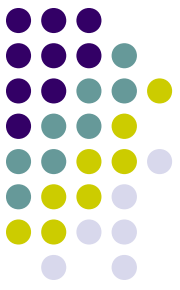


# Discussion

- **Relation To Learning:** A discussion that facilitates purposeful sharing of useful knowledge supports learning [7].
- **Properties of Effective Discussion for Learning:**
  - Sustainability
  - Broad Participation
  - Focus on topics related to learning goals [8]

7-Brookfield, S., & Preskill, S. "Discussion as a way of teaching: Tools and techniques for democratic classrooms," San Francisco: Jossey-Bass 1999.

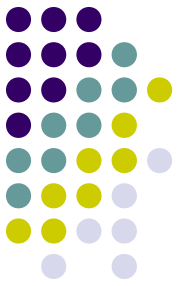
8-Guzdial, M., & Turns, J."Effective discussion through computer-mediated anchored forum," The Journal of the Learning Sciences, 9 (4), 2000, pp. 437-469.



# Research Framework

- **Problem Statement:** Online discussions lack in-depth and sustainable interaction because
  - Students' communication is mostly independent monologues
  - Students are more inclined to share existing experiences and perspectives than providing each other with specific and relevant feedback
- **Purpose:** My paper proposes anchored discussion technology as a computer tool to foster online discussions between learners.

# Anchored Discussion Technology



- **Definition:** Integrating a document such as a research article into a threaded discussion by cross-linking both items to each other.

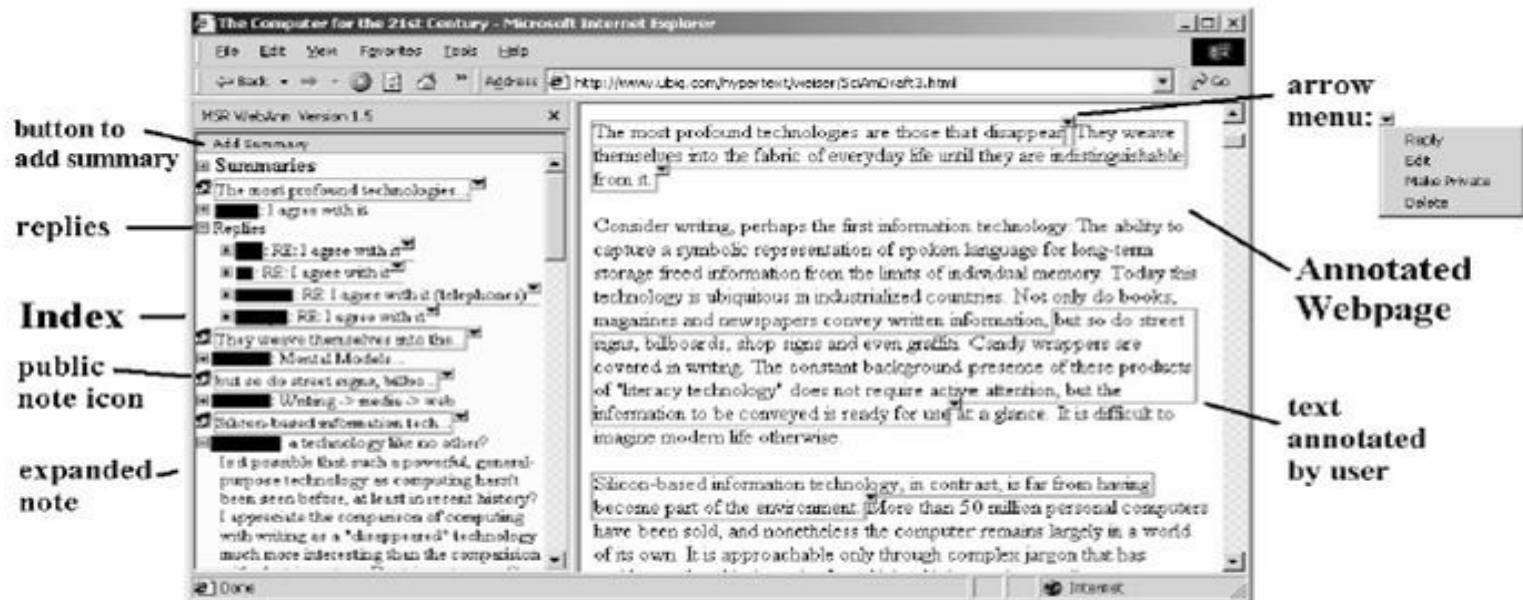
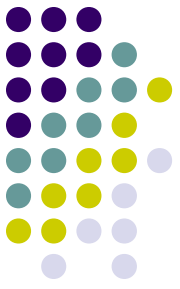


Figure 1: Anchored Discussion Technology Example [9]

# Anchored Technology

## Advantages and Limitations



### Advantages

- More clarity about the target of discussion and less effort to follow the discussion [10]
- Strengthening the link between discussion and study material with document centeredness [11]
- Increasing the average number of messages per author per paper as well as the average number of replies per author per paper [11]

### Limitations

- Difficulty of making general comments [11]
- Discussion overload especially for big groups [11]
- Scattered comments [11]

10-Guzdial, M., & Turns, J. "Effective discussion through computer-mediated anchored forum," The Journal of the Learning Sciences, 9 (4), 2000, pp. 437-469.

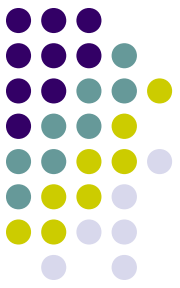
11- Bernheim Brush, A. J., Barger, D., Grudin, J., Borning, A., & Gupta, A. "Supporting interaction outside of class: Anchored discussion vs. discussion boards," In G. Stahl (Ed.), Computer supported collaborative learning: Foundations for a CSCL community, Proceedings of CSCL, 2002 pp. 425-434.



# Research Question and Hypotheses

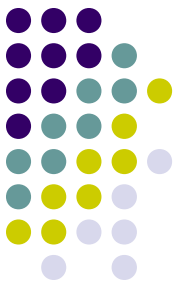


- **Research Question:** What degree of collaborative knowledge construction could be achieved on a topic relevant to a class by a cooperative group of learners who use anchored discussion over a traditional discussion forum?
- **H1:** The proportion of task related communication to non-task related communication is greater in anchored discussion forum.
- **H2:** Anchored discussion forum promotes higher levels of collaborative knowledge construction than a regular discussion forum.



# Method: Data Collection

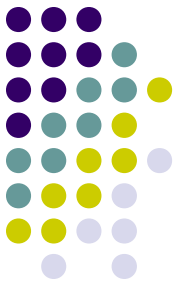
- Experimental study will take place as a part of 15 weeks graduate course in which students will need to work collaboratively on a group project by using either anchored or traditional discussion forum.
- The purpose of group project will be enhancing students' confidence and ability to express their opinions regarding to research papers in a manner that matches the class purpose.
- Students will be randomly assigned to the test and control groups. To prevent diffusion of treatment, group project grade will be based on group presentations and individuals' forum postings.



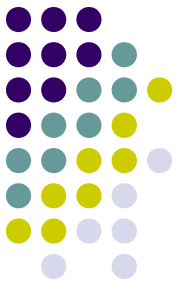
# Method: Data Analysis

- I will use two content analysis models to understand the processes that participants engage in as they input messages in a discussion tool.
  - Model 1: Veerman et al.'s Model [12]
  - Model 2: Transcript Analysis Tool [13]
- These models are based on the assumption that collaborative knowledge construction is an observable process.
- Two researchers will categorize the messages based on the models. Cohen's Kappa statistics will be calculated to assess inter-judge agreement.
- The result of content analysis will be validated by information acquired from interviewing students.

# Expected Research Contribution



- In a collaborative learning environment, anchored discussion technology could facilitate better understanding of a subject matter by linking effective presentation of online discussions to learning objectives.



# **Thanks For Your Attention**

- Comments & Questions