Reconceptualizing Scaffolding: Scaffolding a Community of Learners

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What might it mean to scaffold a community of learners?

- **Common Approach:** Focus on scaffolding individuals in the community. The community will move forward through the growth of its members.

- **Proposal:** Focus on scaffolding the community (as a unit) in ways that will move every participant and subgroup forward; scaffold individuals and small groups in that context.
Systematically scaffolding a community of learners

Design scaffolding for each social grouping with other groups in mind.

Teacher scaffolding

Small-group Scaffolding

Individual Scaffolding

Community Scaffolding

- Simple projects
- Community rituals
- Subversive orchestration

- Group Rituals
- Design Diary Pages and Software w/structuring, hints, examples
- Artifacts to think with

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Learning by Design™

- A project-based inquiry approach to science education for middle school
- Students learn science concepts and practices in the context of attempting to achieve design challenges.
- Highly collaborative
- A variety of practices are embedded in the approach to promote the kinds of experiences and reflection on them that promote transfer.
LBD's Community Scaffolding

- Project experiences that expose the community to practices
- Community rituals
  - public expectations and purposes
- Subversive orchestration
  - Distribution of investigative responsibilities
The Book Support Challenge:
An example from LBD™’s *Apollo 13*

- Our goals: Help the community
  - come to appreciate collaborative learning
  - begin becoming proficient at vocabulary and practices of design
- Design and build a structure that will hold up a large textbook 3 inches above a desk using only index cards, paper clips, and rubber bands.
The Book Support Challenge: Orchestrination

- Students work in groups for 10 - 15 minutes to achieve the challenge.
- The class reads about "gallery walks" together (fancy show and tells).
- Each group presents their design; there's some discussion about each.
- Teacher asks students if they want to try again.
Students try again.
They hold another gallery walk.
They accuse each other of copying.
The teacher introduces them to the notion of building on the work of others, patents, citations, ...
They read about collaborative learning and its benefits and requirements (e.g., giving credit)
What's the scaffold?

- A simple project experience and way of orchestrating it
  - that introduces the community of learners to a set of practices
  - that asks students to carry out those practices publicly
  - that engages students in moving each other forward (through modeling and traditional scaffolding)
Results ...

- Students work on other challenges and use the practices they've experienced and talked about.
- Some begin to use the words collaboration, credit, iteration, ...; others follow suit over time.
- Students get better at practices, some adopt early, others follow.
- Students and teacher refer to these experiences as anchors to make points about designing and collaboration.
LBD's Community Rituals

- Gallery walk -- scaffolds explanation
- Pin-up session -- scaffolds justification
- Results presentation -- scaffolds justification and data interpretation
- Design rules of thumb -- scaffolds data interpretation
- Whiteboarding -- scaffolds question asking
What's the scaffold?

- A systematic way of carrying out some important skill set that
  - systematizes practices to make them methodical; promotes habits
  - situates practices in several contexts; promoting adaptability
  - engages students in public practice as collaborators; affording noticing, asking, discussion, productive reflection
Two LBD™ community rituals

- Gallery walks (explanation)
- Pin-up sessions (justification)
- Ritualized public ways of participating in science practices
- Well-articulated expectations
- Repeatedly practiced and publicly discussed
Results ... 

- Students initiate their own use of these practices
  - the pin-up session story
  - creating rules of thumb
  - messing about during interviews and performance assessments
  - whiteboards science fair projects
- Students adapt the rituals to later needs
  - e.g., when teacher stops calling gallery walks
But simply scaffolding the community as a whole is not enough

- Within the community context, need to scaffold
  - work/learning groups
  - individuals, including the community leader

- so that they can be successful as individuals, within subgroups, and within the community
Group Scaffolding

- **Group rituals**
  - Messing about
- **Design Diary Pages** (make expectations clear for group activities through structuring and hints)
  - Designing and running experiments
  - Construction, testing, explanation, iteration
  - Preparing for community rituals
- **SMILE** — Extend design diaries, adding more specific hints and examples, focused on planning, reflecting, and articulating, and on preparing for public rituals
- **Artifacts to think with** — the physical artifacts the students are designing
Design diary pages

My Experiment

- What you want to find out
- Predict what will happen
- My Plan

- What I Must Produce to Meet the Challenge
- Criteria to Meet and Constraints to Satisfy

Data and Sketches

- Step-by-Step Procedure
- Data Summary

HINT: Look for trends and patterns you see in your data.

What Did You Learn

Problem Understanding

- My Statement of the Challenge
- What I Know That Will Help
- What I Still Need to Know

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Scaffolding individuals

- **Student scaffolding**
  - The same as group scaffolding -- structuring, hints, and examples that ritualize articulation, note taking, and presentation -- but individuals use the pages for homework to prepare or summarize

- **Teacher scaffolding**
  - All of the scaffolding scaffolds the teacher.
Traditional view of scaffolding

- Support one gives to an individual to help him or her perform beyond his/her capability within his/her ZPD
- Provided in such a way that the learner can gradually increase what he/she can do by him/herself
But aiming scaffolding at individuals is only one way of helping members of a community learn.

- If we take the ideas of collaborative learning and CSCL seriously, then our approach to scaffolding should go beyond a focus on individuals.
Redefining Scaffolding

- **System of supports** provided to a community to help its members perform beyond their joint capabilities within the community ZPD.

- Provided in such a way that learners can gradually increase what they can do by themselves and with others, raising the level of performance of individuals, subgroups, and the community at the same time.
Systematically scaffolding a community of learners

Design scaffolding for each social grouping with other groups in mind.
Design Principles for Community-Oriented Scaffolding

I’m not sure if I have many, but I do have lots of questions that need to be answered so that we can become systematic
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Lots of questions ...

- What is a community ZPD?
- What might it mean for a community to increase its level of performance? How do you measure that?
- What agents are available in the community to provide scaffolding? How should scaffolding responsibilities be distributed?
What do we know about putting such a system together?

● To reach every student, need multiple ways of providing the same help -- redundancy is a value
● Seamless integration into classroom activities is essential
● Iterative practice and reflection
● Teacher buy-in and facility
Systematic redundancy

- Support individuals in their participation in their work groups
- Support work groups in their participation in community activities
- Support the community such that it recognizes the need for group and individual practices
- Every activity has to have a reason that’s meaningful and visible to students and teacher
What is a community ZPD?

For LBD™

- In the beginning, there are skills students have that they don’t know are important for science; if we make them aware, they can begin to use them.
- Gradually, it’s time to help them get better at those skills.
Community ZPD is not simply the union of all ZPD’s in the community

- Rather, a mix of developmental points that need to be hit
- How do you choose those points?
- We “computed” the community ZPD for middle schoolers through observation
What agents are available to scaffold?

- In project-based classrooms
  - Teacher
  - Peers
  - Invited experts
  - Activities
  - Paper charts and structured pages
  - Software
  - Tools and objects under investigation
How do you divide the scaffolding?

- Paper gets structuring
- Computer gets structuring, common hinting, and examples
- Teacher models and orchestrates
- People are responsible for special cases
- What else?
We get different results than Betsy and Phil. Why?

- We find that very specific scaffolding works well.
  - Not an entirely fair question because we haven’t done comparisons across different kinds of scaffolding.
  - Because the scaffolding is part of a bigger system that orchestrates introduction to, repetitive practice, incremental learning of practices, and use of scaffolds?
  - Because our scaffolding is associated with particular goals students have at the moment?
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