

Mindful of Process: Scaffolds for Collaboration Discourse in Design Education

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Abstract: Given the critical importance of collaboration in lifelong learning, this paper highlights the need for interventions that help learners develop awareness of the social dimensions of group problem solving and adopt patterns of discourse leading to more successful collaborative learning outcomes. In pursuit of this, I present scaffolds that were piloted on students learning the practice of collaborative human-centered design, and argue for the larger significance of design as a framework for developing collaborative capacities.

Introduction

Collaboration can be thought of as involving a dual problem-space that participants must simultaneously negotiate (Barron, 2003). One is a *content space* consisting of the problem to be solved and the solutions generated. The second is a *relational space* consisting of social interactional challenges and opportunities that structure group discourse about the content space. The success of collaboration depends on the ability of a group to be mindful of and develop both spaces simultaneously. In practice, however, these spaces compete for limited attention and the salience of subject-matter in the content space typically dominates. This paper therefore highlights the need for interventions that foster collaborative capacities in the relational space. I present pilot examples from elementary school students learning human-centered design practices.

Background

In her study of twelve 6th-grade triads engaged in collaborative problem solving, Barron (2003) found that between-triad differences in post-task individual learning assessments could only be accounted for by differences in groups' social interactions, i.e. how they negotiated the relational space. Two specific patterns of collaboration discourse were observed in successful groups and lacking in less successful groups.

- (A) *Successful groups tended to discuss or accept correct idea proposals while less successful groups were likely to ignore or reject them.*
- (B) *Utterances were more likely to build on immediately preceding utterances in successful groups, whereas conversations in less successful groups were relatively more discontinuous.*

Barron's findings suggest that these patterns of successful discourse help groups achieve shared engagement as requisite for establishing a joint problem-solving space and group cognition (Stahl, 2006; Roschelle, 1992).

From an interventionist perspective, these findings beg the question of how we can encourage learners to adopt discourse practices that improve collaborative learning outcomes. There is evidence that through participation in intentionally designed discourse communities learners come to appropriate conventions for discussing subject-matter in the content space, such as the scholarly convention of justifying claims with evidence (Engle & Conant, 2002). What sort of intervention could encourage learners to appropriate discourse conventions in the *social-relational* space, specifically the ones linked to collaborative learning achievement?

In the next section I introduce a collaborative learning activity highly suited for studying and supporting the social-relational space in group problem solving: groups of learners engaged in the practice of human-centered design, e.g. need-finding, brainstorming, prototyping and user-testing. Group brainstorming, for instance, rapidly generates a complex, branching stream of ideas and evaluations exhibiting discursive patterns of proposal, response and discussion. Practitioners in some design communities have adopted eight so-called "Rules of Brainstorming" as interventions in their own collaborative processes to codify norms of discourse during brainstorming (Sutton & Hardgaden, 1996). Interestingly, two of the most important rules, "defer judgment" and "build on the ideas of others", correspond precisely to the discourse patterns (A and B above) that Barron found were associated with successful collaborative learning outcomes (see Table 1).

Table 1: Comparison between two rules for brainstorming (Sutton & Hardgaden, 1996) and patterns of discourse found to be associated with more and less successful collaborative learning outcomes (Barron, 2003).

Brainstorming Rule	Successful Discourse Pattern	Unsuccessful Discourse Pattern
Defer judgment/rejection of new proposals	New proposals are discussed or accepted	New proposals are ignored or rejected
Build new proposals on the ideas of others	New utterances are closely linked to the topic of immediately preceding utterances	New utterances are unrelated to the topic of immediately preceding utterances

Interventions

Intervening in the collaborative design process, in the sense used here, is what Fischer and colleagues call “metadesign” (Fischer & Giaccardi, 2006). “Metadesigners use their own creativity to create socio-technical environments in which other people can be creative. They must create the social conditions for broad participation in design activities which is as important as creating the artifact itself...” (Fischer, 2007). What follows, then, is a first report on the development of a metadesign framework for collaborative design education.

In partnership with a K-8 private school, a group of design educators piloted scaffolds for collaborative design discourse with approximately thirty students between 2nd and 8th grades. The students engaged in a series of design challenges over the course of a summer, the challenges themselves being prototypes for a design curriculum to be implemented in the upcoming school year. The overall goal was to help students become “mindful of process” — that is, to attend to and develop the social-relational space during their collaborations, in addition to the more salient subject matter of the problem content.

In order to scaffold the successful collaborative discourse patterns from Table 1, educators repurposed a technique from the improvisational theatre tradition. During introductory brainstorm sessions, students were encouraged to begin new proposals with “Yes, and...[new proposal]”, as opposed to “Yes, but...[critique of previous proposal]” or any other unsuccessful pattern. The “yes, and” construction defers analytical judgment of the previous proposal and verbalizes acceptance (“yes”), and then builds on the proposal with a related idea (“and...”). Students role-played brainstorms with and without the discourse scaffolds and then were prompted to reflect on the perceived differences. After the introductory training period, students engaged in brainstorming for their own small group design projects. Students were widely seen to practice the learned discourse patterns even though the explicit “yes, and” construction was often absent. This suggests that the relational space discourse patterns had been internalized. However, lacking a suitable control group, this pilot finding is tentative at best.

Discussion & Conclusion

“Everyone designs who devises courses of action aimed at changing existing circumstances into preferred ones... Schools of engineering, as well as schools of architecture, business, education, law, and medicine, are all centrally concerned with the process of design.” (Herbert Simon, 1981)

As Simon indicates in the quote above, design is a useful model for understanding practices across many disciplines. This paper highlights the potential for human-centered design as a collaborative learning activity to (a) foster awareness of the social dimensions of collaboration and (b) support the adoption of discourse patterns known to be associated with more successful collaborative learning outcomes. The capacity to be mindful of the relational space during collaboration is a critical component of lifelong learning as there are few human endeavors that do not involve some form of social collaborative discourse.

While this paper has focused on a particular formal activity that helps newcomers learn collaborative design practice, it’s also important to recognize the informal sociocultural context in which these learning activities take place. The educators involved in the present study are members of a community of design educator-practitioners. Newcomers to the community are welcomed not only as formal learners, but as legitimate participants in a community of practice (Lave & Wenger, 1991). Learning to collaborate is thus a process of socialization, not merely the adoption of particular discourse patterns. In short, the community’s culture of collaboration reinforces its practice of collaboration. Central to the culture of the community in question is the notion that being mindful of the collaborative design process is as important as the products of that process, if not more so. Future work will seek to understand how people learn to collaborate in communities that are mindful of process.

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