Repertoires of Collaborative Practice

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Abstract. This symposium presents results from a coordinated suite of studies on collaborative practices, and the theoretical framework we have developed to account for what is learned from collaborative episodes. We use the phrase 'Repertoires of Collaborative Practice' to describe the individual, interpersonal, contextual and community practices that can influence collaboration. We hypothesize that repertoires of collaborative practice are developmental in nature, and that collaborators may become adept at selecting which elements from their repertoires should be implemented in specific situations. The theoretical description is accompanied by four papers applying this framework to examine the collaborative practices in different collaborative settings – online gamers, adolescent musicians, middleschool technology projects, and a comparative study of Quakers and product designers.

Introduction

Collaborative activities take many forms, and are an increasing reality in education and work in the 21st century. However, how people learn to collaborate, and what people transfer from one collaborative situation to another is still undefined. While researchers have been exploring for decades what makes a single collaborative learning instance successful—by examining the individual attributes of collaborators, the interactions that occur, the context of a collaborative episode and the institutional or community practices that surround the episode—we are yet to fully understand how expertise develops. Through studying how people collaborate and how people talk about their collaborations, we propose that people develop Repertoires of Collaborative Practice, which they draw upon when they encounter a new collaborative situation.

The term Repertoires of Collaborative Practice reflects the breadth of factors that come into play during a collaborative episode. These include intentions, interactions, contextual affordances and community practices. We theorize that repertoires of collaborative practice develop through experience with different forms of collaboration and are influenced by the collaborative context. They include metacollaborative knowledge for managing interactions, monitoring the development of shared problem space, appropriately leveraging contextual affordances, and inventing new ways of interacting when needed.

We have built on the work of Gutierrez & Rogoff (2003) in characterizing our topic as repertoires of collaborative practice. Gutierrez and Rogoff describe linguistic and culturalhistorical repertoires as ways of engaging in activities which are developed through prior experiences. They emphasize that these repertoires can be differentially accessed across contexts, and that people need to develop dexterity in drawing on the most appropriate behaviors for a given context. In the same way, we see repertoires of collaborative practice as ways of engaging in collaborative activities that collaborators can elect to use in particular contexts. These repertoires, and an understanding of the conditions in which they appropriately come into play, are developed through individuals' prior experiences collaborating and interacting with others and feedback in those situations about what is effective or problematic. The implementation of such repertoires of collaborative practice in action is strongly influenced by the context of the collaboration, the repertoires that collaborators bring, and the cultural affordances of the community in which the episode occurs.

Our motivation for proposing and investigating this framework is twofold. First, there is a need to develop more comprehensive and inclusive theories to understand variability in collaboration. Inevitably, studies of collaborative learning find significant variability in learning or performance outcomes. Effect sizes for collaborative conditions range from 0.21 (Slavin, 1990) to 0.88 (Johnson & Johnson, 1992). This variation has been explained in many ways, and by drawing on quite disparate theoretical constructs. The second motivating factor for this work is the increasing use of, and need for, collaboration across many situations and contexts in the 21st century world. There is increasing recognition that the solutions to the societal and intellectual challenges we face, currently and in the future, will be solved collaboratively. The learning sciences literature calls out for more robust, holistic learning theories that articulate the significance of social resources and historical and developmental processes in learning (e.g., Cole, 1996; Rogoff, 2003; Wertsch, 1991).

Understanding how people become flexible collaborators who can draw on prior experience to develop new practices that support joint work, is essential to improve environments that require people to learn collectively, share knowledge, network, and innovate (JohnSteiner, 2000).

The Repertoires of Collaborative Practice framework allows us to view the practices that people bring to a collaborative episode through four lenses: At the individual level, intentions and orientations are important; at the interpersonal level, ways of supporting and managing the joint problem space and the relational space are focal; the context level allows us to examine how the constraints of a particular task or episode influence the outcomes of a group; and at the community practice level, institutional norms and historical ways of interacting are attended to. Following Rogoff (2003), we see these as interrelated planes that systemically interact in any collaborative situation but that are usefully segmented for analytic purposes.

In our four symposium papers, a variety of collaborative situations are explored. We see how each particular context and its community norms affects collaboration. Each paper will explore the existence or development of collaborative practices. By using multiple types of collaborative activity to elaborate our framework, we have been able to identify the aspects of collaboration that are most important across different settings. We have also identified features of collaborative practice that are predominant within some collaborative situations, but virtually unnoticed in others. By comparing and contrasting types of collaboration, and how collaborators conceptualize their joint work, we consider how practices from one community can be adapted or abandoned within a different context, depending on constraints or affordances at the four levels.

Paper 1: Collaboration in Massively Multiplayer Online RolePlaying Games

Author: Sarah Walter

I have participated in an online gaming community for over a year, capturing video, audio and text chat of intense collaborative gameplay activities known as raids. Participants spent months figuring out effective strategies, returning weekly to execute the strategy, until they were finally successful in completing the raid. Combined with interview data, analyses of how participants learned to collaborate in these raids over several months are presented. I examine how joint attention is established and maintained in the virtual setting, the role of newcomers in the community, influences of the larger gaming community, and how participants solved problems concerning strategies for success. Quantitative data, such as number of teammate casualties and time to completion, help illustrate learning and successful innovation over time.

Paper 2: "Don't touch anything, it might break!": Adolescent musicians' accounts of collaboration and access to technologies seminal to their musical practice

Author: Véronique Mertl

In this ethnographic study, I investigate the accounts of adolescent musicians about collaborative practices in the context of their outofschool musical practice. I seek to understand the complexity of collaborative engagement by investigating how people in collaborative settings think about and design for collaboration and by exploring how interactions unfold within the ecology of the music context. The use of technologies was central to their creative process when they composed, performed, and recorded their own music. Additionally, the ability to access these tools and resources were vital to their collaborations since knowledge and the collaborative process is distributed between members and the resources and tools they use (Hutchins, 2002).

Through interviews and videorecordings of rehearsals and performances of ten adolescent hip hop, jazz and rock musicians, I report on their sophisticated collaborative practices when managing their music groups, strategizing to recruit new members, and composing and recording new songs. Interestingly, within outofschool music organizations, the adolescent musicians were often marginalized from the technologies seminal to their musical practice. The very institution created to support their practice seemed to erect barriers for the musicians. One hiphop artist was told by facilitators not to touch anything when recording. She saw the recording studio as inaccessible, even though she was actively trying to learn recording technology and was designing a recording studio in her own home. Technological tools and resources were not part of the collaborative practices for the adolescent youth in these venues and there was a divide between how youth gained technical expertise to sustain their musical practice and the barriers to technology.

Paper 3: Learning to collaborate through multimedia composing

Authors: Caitlin Martin & Brigid Barron

In this presentation we share middle school students' theories of collaboration as they develop in the context of projectbased work. Our research centers on the Digital Youth Network (DYN), a digital literacy program creating opportunities for youth to extend their consciousness around social change through the production and critique of media (Pinkard, et al., 2008). The DYN program is part of an innercity charter school

located in the Midwest serving approximately 140 68 graders (ages 1113) from middle to lowincome households. DYN provides mandatory school day technology classes and voluntary afterschool technology clubs, both offering opportunities for students to work with peers on collaborative projects. As students move from sixth to eighth grade, we collect longitudinal learning data from interviews and observations. Interviews ask students to reflect on causes of more and less successful collaborations and to describe advice they would offer to peers starting a new collaborative project. Our analysis reveals that students' emergent theories attend to: (1) the necessity of aligning goals of team members around project quality and effort; (2) the risks and benefits associated with partnering with friends; and (3) the frequent difficulty and importance of having all ideas heard. Students were able to articulate strategies for creating conditions to support collaboration including: (1) designing roles allowing everyone to participate and contribute; (2) drawing on outside resources and talent; and (3) attending to time management. These themes will be discussed in relation to time and assessment constraints of schoolbased collaboration as compared to the symposium's other collaborative contexts. A case study will illustrate how these themes played out for one collaborator in the context of a multiweek classwide group project involving authoring and recording a song and producing a corresponding music video.

Paper 4: Prototyping practices in Quaker and product designer communities
Author: Daniel Steinbock

This paper presents a comparative qualitative inquiry of two different communities of practice: the Religious Society of Friends (Quakers) and humancentered product designers. The communities are compared in terms of practices they have developed to organize and regulate collaborative activity, with emphasis on assessing if and how participants change existing practices or innovate new ones. The primary purpose of this inquiry is to gain insight into how repertoires of collaborative practice develop and evolve over time.

Each of the two communities under study selfidentifies as a "culture of collaboration" and participants are peculiarly attentive to the socialrelational factors of their own collaborative practice. In addition, each community, in its own way, is engaged in ongoing innovation: for the Quakers, continuous revelation of new spiritual insights; for the designers, development of novel products and services. The communities were chosen for these qualities, as reflective practices around issues of collaboration and innovation are highly visible to ethnography in these settings. Drawing on this data, I use the designers' concept of a 'prototype' to explain how participants view the process by which practices evolve over time. The original communities of practice model (Lave & Wenger, 1991) conceptualizes participation as centripetal socialization into a fixed repertoire of practices which are reproduced unchangingly over time. This is insufficient to explain how innovation can lead to the emergence of new practices, or how existing repertoires of practice are dynamically modified and improved upon by participants. This paper reconceives participation in communities of practice as an ongoing, iterative design process, wherein practices are not finished products but prototypical worksinprogress.

References

Gutierrez, K. D., & Rogoff, B. (2003). Cultural ways of learning: Individual traits or repertoires of practice. *Educational Researcher*, 22(5), 1925.

Hutchins, E. (2002). *Cognition in the wild* (5th ed.). Cambridge, MA: MIT Press.

John Steiner, V. (2000). *Creative collaboration*. New York: Oxford University Press.

Johnson, D. W., & Johnson, R. T. (1992). Positive interdependence: Key to effective cooperation. In R. Hertz-Lazarowitz & N. Miller (Eds.), *Interaction in cooperative groups: The theoretical anatomy of group learning* (pp. 174 -99). Cambridge, England: Cambridge University Press.

Lave, J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.

Pinkard, N., Barron, B., Martin, C., Gomez, K., Zywica, J. (2008). Digital youth network: Fusing school and afterschool contexts to develop youth's new media literacies. Paper presented at *AERA '08: American Educational Research Association Annual Meeting*, New York, NY.

Rogoff, B. (2003). *The cultural nature of human development*. New York: Oxford University Press.

Slavin, R. (1990). *Cooperative learning: Theory, research, and practice* (1st ed.). Englewood Cliffs, New Jersey: Prentice Hall.

Wertsch, J. V. (1991). *Voices of the mind: A sociocultural approach to mediated action*. Cambridge, MA: Haward University Press.

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