Sociocognitive Apprenticeship: Mediating Practices and Identities

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Abstract: The learning sciences community has gleaned a good deal from research on traditional apprenticeships, and efforts to implement cognitive apprenticeships in schools. A hybrid model of "sociocognitive apprenticeship" is proposed, combining aspects of traditional and cognitive apprenticeships to aid culturally disadvantaged students to develop successful participation in and identification with professional communities of practice. The sociocognitive apprenticeship model is illustrated through results of a descriptive study of a community science and engineering program for teenage youth.

Introduction

Some years ago, Lave and Wenger (1991) sparked a good deal of interest in traditional apprenticeships among educators. Some educators hoped to glean insights into how to improve education within schools based on practices from traditional apprenticeships, leading to recommendations for “cognitive apprenticeships” (e.g., Brown, Collins & Duguid, 1989). We describe a hybrid of traditional and cognitive apprenticeships, which we refer to as "sociocognitive apprenticeship".

With previous frameworks on apprenticeship as a backdrop, we analyze the apprenticeship-like activity within a setting combining work and academic learning—the “YouthScience” program run by a large community-based organization in a United States city with a mission to "stimulate interest in and understanding of science and technology throughout the community." The program "works with underserved teenagers throughout the course of their high school career, providing them with a work-based, inquiry learning environment that focuses on science, mathematics, and technology" (program website). In this work, it became apparent to us that it might be useful to articulate a new hybrid of apprenticeship, which we term "sociocognitive apprenticeships", that focuses simultaneously on increasing participation in a community of practice through learning and through encouraging positive trajectories of identification (Wortham, 2006).

YouthScience as a Sociocognitive Apprenticeship

Traditional (Lave & Wenger, 1991), cognitive (Brown, Collins & Duguid, 1989), and the sociocognitive apprenticeship we see in the YouthScience program have several similarities, but differ in the nature of the setting, what sort of work they are based on, their goals, and the participants.

The YouthScience programs tended to utilize instructional modes also found in traditional and cognitive apprenticeships. Just as master tailors and teachers sometimes *model* expert activity, supervisors in YouthScience used modeling. For instance, one supervisor modeled leading an informal science activities for her teens before asking them to do so, whereas another often modeled lab procedures such as measuring out amounts of liquid, and still others modeled the use of drills they would be using in a greenhouse construction project. From time to time, teens modeled some expert performance for one another in a way that was pointed out by the teens themselves or their supervisors. In addition, *coaching* behavior was evident in the course of YouthScience activities, as when a supervisor helped a teen adjust her mixing of chemicals or another sat down with some teens to help them solve a problem with fairly testing greenhouse skin strength. *Scaffolding and fading* was done in one group during the first two weeks when the teens practiced their activities frequently, and their supervisors prompted them to go on to the next steps, as well as explicitly reflected on successes and weakness after every session. The level of support provided by the supervisors faded over time, and they played a less active role when visiting groups were on hand. Finally, multiple subgroups employed projects that, as in traditional and cognitive apprentice, were meaningful to the participants and often had some concrete results (e.g., actual greenhouses, successful sessions with visiting community groups).

The nature of the apprenticeship setting, practices, and goals tend to vary in important ways across these types of apprenticeship. In a traditional apprenticeship, the setting is a workplace, with all that implies. Workplaces are places where workers are compensated for their time and effort, and traditional ones such as tailors' workplaces are based on time-honored practices of a craft or trade. The goals of a traditional apprenticeship are the practical creation of some products, such as clothing. Cognitive apprenticeships tend to be set in schools, which have their own set of practices and goals based on the history of schooling, and academic disciplines such as science, history, literature, and so on. In a given cognitive apprenticeship activity, there are not necessarily any practical goals, with “learning the material” taking its place; nor is there necessarily an alternative way of conducting business outside of “traditional schooling” that is known to the teachers and students. In a sociocognitive apprenticeship like YouthScience, the fact that the setting is a workplace that explicitly identifies itself as “conducting a lot of professional development” makes a difference. The fact that

YouthScience is a workplace implies that they have practical outcomes they are responsible for, and depending on their employees to help them fulfill. They also have academic outcomes they are trying to fulfill, such as helping the teens learn science or engineering content, but this consistently takes a second place to getting some meaningful work done. As a model for their practices, we found some evidence that the supervisors in YouthScience were trying to enculturate the youth into "knowledge work" (Drucker, 1959/1996) which refers to white collar, information-rich work. For instance, one pair of supervisors explicitly wanted their teens to not just focus on the blue-collar labor of building a greenhouse, but instead to spend more time and attention on the white-collar knowledge work of designing, building, and testing greenhouse structures and skins, based on the work of professional engineers.

Moving to the participants, in some ways the sociocognitive apprenticeship has similarity to cognitive apprenticeships, and in other ways to traditional apprenticeships. Like teachers leading a cognitive apprenticeship, the supervisors of the sociocognitive YouthScience apprenticeship often do not have as much expertise as the leader of a traditional apprenticeship, nor do they have as much incentive to stay up to date with the latest practices in the professions that inform the work. But any expertise and experience cognitive or sociocognitive apprenticeship "leaders" have can help them to "broker" authentic practices and import authentic artifacts from the work world (Wenger, 1998). For instance, one supervisor brokered the "design-build-test" practices she was familiar with from engineering to her group of teens, and introduced teens to the design software "SketchUp" for analyzing space use in the greenhouses with the same technological artifact some professional architects use; other supervisors brokered laboratory practices they'd been introduced to in university chemistry courses to the their groups.

The mix of participants other than the supervisors found in a sociocognitive apprenticeship hearken back to the more traditional apprenticeships, in contrast to the tendencies of cognitive apprenticeships set in schools. Schools throughout much of the Western world are overwhelmingly set up as groupings of children at one age or developmental level. Thus, students in a school-based cognitive apprenticeship tend to have a fairly uniform developmental level compared to one another. In other words, school classes are set up so that all but one or two members of the group have maximum overlap in their "zones of proximal development" (Vygotsky, 1978), or what they are capable of doing with the help of people with more expertise. In classrooms, it is commonplace for teachers implementing a "cognitive apprenticeship" to encourage students to see one another as resources for one another, but the age-graded groupings tends to work against this exhortation, forcing students to rely on their teacher as their primary source of expertise. In contrast, traditional apprenticeships and the sociocognitive apprenticeship of the YouthScience program consistently have a broad mixture of newcomers and varying levels of oldtimers among their apprentices. One group in this study, for instance, included several rising 9^{th} and 10^{th} graders, as well as a few rising 11^{th} and 12^{th} graders. The fact that the apprentices' zones of proximal development have a broader range and richer set of overlaps becomes a resource for the YouthScience community, where expertise and multi-level guidance and coaching is available among the apprentices as well as from their supervisor.

The strengths apparent in a sociocognitive apprenticeship such as YouthScience point to some possibilities for how some school-based cognitive apprenticeships could be improved. In particular, aiming toward projects with practical goals in a school, as long as they are based on a meaningful and authentic sort of knowledge work related to the area(s) under study, is eminently possible. And finding more ways to mix up the age and developmental grouping to the advantage of all learners in schools is worth exploring.

The culturally sophisticated sociocognitive apprenticeship like that described in this study enabled disadvantaged African-American youth in an urban setting to connect to the professional worlds of science, engineering, and other knowledge work. Although school-based cognitive apprenticeships might work for students whose family lifeworlds are already more connected to that of professional worlds such as that of science and engineering, the YouthScience teens clearly benefited from being guided across the borders into the practices of professional workplaces.

References

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