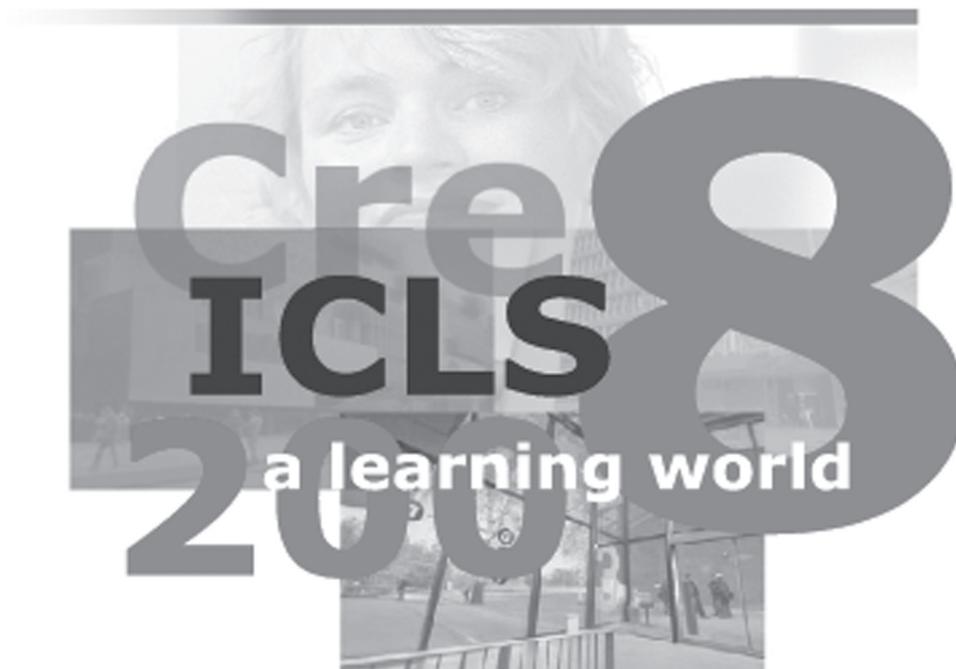


# International Perspectives in the Learning Sciences: Cre8ing a Learning World

PROCEEDINGS of the Eighth International Conference  
for the Learning Sciences – ICLS 2008

## **Volume 1**



# Colofon

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# Foreword

Though formally incorporated as a society in 2002 for “scientific and educational purposes, more specifically to promote the communication of scientific research in the interdisciplinary field of the learning sciences”, the International Society of the Learning Sciences actually can be said to have begun in 1991 with the publication of the first issue of the *Journal of the Learning Sciences*. As this is the case, it’s actually strange that it has taken until 2008 for the International Conference on the Learning Sciences to be held outside of the United States, in Europe.

Why, you may ask, do we think that it’s strange that it has taken 17 years and 7 ‘international’ conferences for this to happen? The reason is simple. Europe has long embraced, propagated and based much of its education on the interdisciplinary study of how people learn and how learning environments can and should be designed to promote learning. Pioneers such as Lev Vygotski, Piotr Gal’perin, Maria Montessori, Kees Boeke, Jean Piaget, Peter Petersen, Johann Pestalozzi, and Jan Amos Comenius – to name a few – all promoted new forms of learning and new learning environments based on natural experiments and human approaches to learners and learning. Jan Amos Comenius (1592-1670), who wrote the *Didactica Magna* (The Great Didactic), has been called the father of modern education. The *Great Didactic* is his systematic exposition of his educational principles and goals, discussing how teachers ought to “follow in the footsteps of nature,” meaning that they ought to pay attention to the mind of the child and to the way the student learned to make them knowledgeable about the world, able to judge its events for themselves, and to generate and sustain the conditions of progress. Sound familiar? Johann Pestalozzi, who lived from 1746 to 1827, wanted “to wrest education from the outworn order of doddering old teaching hacks as well as from the new-fangled order of cheap, artificial teaching tricks” and based on research tried to reconcile the tension, recognized by Jean Jacques Rousseau, between the education of the individual (for freedom) and that of the citizen (for responsibility and use).

In this conference and its proceedings we are proud to present the top of the international and interdisciplinary field exhibiting instances of research, theories and praxis from many different countries and cultures, from a broad spectrum of disciplines and fields (e.g., education, psychology, gaming, information sciences, science, technology, engineering, mathematics, neuroscience, social sciences, et cetera) and using a broad range of research paradigms (e.g., qualitative, quantitative, ethnographic, design-based, et cetera) all informing research and development activities related to how we learn in formal, non-formal, and informal settings.

*Paul A. Kirschner, Frans Prins, Vincent Jonker, Gellof Kanselaar*

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# Learning from Krumping: Collective Agency in Dance Performance Cultures

Yasmin B. Kafai, UCLA Graduate School of Education and Information Studies, 2128 Moore Hall, Box 951521  
Los Angeles, California 90095-6293, kafai@gseis.ucla.edu

Kylie A. Peppler, Indiana University, 201 N Rose Ave, Wright 4024, Bloomington, IN 47405,  
kpeppler@indiana.edu

**Abstract:** The recognized importance of collaboration has driven the development of learning environments and technologies. Instructional efforts have concentrated on supporting students' development of collaborative agency – knowing how to collaborate in small groups. Much less emphasis has been placed on students' collective agency that would involve participation in large groups prominent in today's social networking sites and online cultures. Here we use our observations in an urban community technology center where groups of 30-40 youth self-organized their dance performances called Krumping and/or Clowning to inspire rethinking from collaborative to collective agency in learning. Our analysis is based on four years of ethnographic field work that helped us articulate different aspects of activity structures that promote collective agency, distributed leadership, and the role of performance. We use these findings to reflect on our conceptions of learning and the design of learning technologies and environments.

## Introduction

Perhaps one of the most pervasive changes in the last twenty years of learning research and practice has been the shift from seeing learning as an individual activity to learning as socially situated activity (Bransford, Brown, & Cocking, 2000). Cognitive and social-cultural theories alike emphasize the importance of collaboration for learning albeit with different implications: while cognitive researchers tend to focus on the contributory role that conflict and discussion has on helping individual learners to articulate their understanding, socio-cultural theorist tend to stress the importance of social contexts and norms that situate learners' interactions in authentic practices (Sfard, 1998). This change has also been driven by demands of the work place in which people often work in teams and not alone. For that reason, many national standards and reform efforts stress the importance of helping students to develop what we would like to call collaborative agency – the ability to participate and perform in groups. Hundreds, if not thousands of research studies have investigated various aspects of collaboration and associated issues: the nature of various group arrangements, interactions with members of different gender, race, ability, and experience, and causes for success and failures of group work (Webb & Palincsar, 1996).

There is, however, one aspect of collaboration that has been readily assumed in all these efforts, which is the idea that collaboration happens in small groups of say, two to four people. We have numerous examples of efforts that promote collaborative arrangements such as reciprocal teaching (Brown & Palincsar, 1984), jigsaw, cognitive apprenticeship (Collins, Brown & Duguid, 1989), communities of learners (Brown & Campione, 1994), to name but a few. There are few examples that consider the learning of collaboration within the context of a larger group, even a classroom of 20 or 30 students. Even if those happen, in school settings it is often the teacher who then directs interactions among all members and assumes the leadership that students otherwise bring to bear in small group collaborations. Recent observations of social networking and gaming communities though suggest that collaboration among hundreds if not thousands of members can also be productive for learning resulting in collective intelligence (Levy, 1997). We have chosen to call this type of collaborative learning collective agency because it emphasizes aspects of collaboration needed to participate and perform in collectives and thus might be different from interactions in small groups.

Our fieldwork in a Computer Clubhouse, a community technology center in one of the poorest neighborhoods in Los Angeles provided us with multiple unexpected opportunities to observe such collective agency in action. While small group collaborations were definitely part of the everyday interactions in the Computer Clubhouse (see Peppler & Kafai, 2007), the Krumping dance performances were organized by 30 to 40 clubhouse members at a time and promoted very different arrangements. Krumping is a dance style that has originated in South Los Angeles; it references African dance forms and is commonly intended as a positive expression of anger or a release of pent-up emotion. This new form of dance is popular among the youth in the area and is characterized by free, expressive and highly energetic moves. The documentary "Rize" (2005) illustrates the history of different forms that have emerged in South Los Angeles since the last riots in 1992. While Krumping is a local practice little known outside of Los Angeles, the efforts of urban youth to find an

artistic outlet for their concerns can help us understand better how such spontaneous collectives form and perform. We also believe that paying attention to such local funds of knowledge (Moll & Gonzalez, 1994) can turn our attention to successful practices in low-income communities that so often are portrayed as deficient in resources and agency. Thus learning from Krumping, as the title of our paper indicates, turns the tables and positions them as a source of inspiration for learning science researchers and designers.

The goal of our analyses is to provide a richer description of collective agency by examining the affordances of the dance activity, the nature of distributed leadership, and the role of performance. While this is only one example of collective activity, we think that a better understanding of how interactions and collaborations are structured in larger groups can provide the insights for designing the next generation of networked learning technologies and environments. More importantly, we are interested in rethinking how collaboration in classroom environments in general can be structured in different ways to facilitate collaborative and collective agencies. In the next sections, we will situate the concept of collective agency within existing learning theories, review examples of learning environments that embody some aspects of it, and then outline features that will help us analyze different aspects of collective agency in youth dance practices.

## Background

Our notion of collective agency borrows its meaning from Goffman's work (1959) in which he describes how people negotiate and validate identities in face-to-face encounters and establish ways to evaluate the meaning of these encounters. Goffman proposed to think about everyday life as a stage in which we perform "face-work" (1974) which may be defined as "the positive social value a person effectively claims for himself by the line others assume he has taken during a particular contact." Dance performances like Krumping provide valid stages where local community members represent themselves and express their emotions. In these performances we can begin to understand the interplay between individual agency (i.e., what the dancer intends to accomplish) and social structures (i.e., the constraints imposed by community expectations) that impact the dance performance. In Krumping performances, the social constraints come in the form of shared understanding of the dance itself and the drive to incorporate old moves into new ones. Thus Krumping is not just about the perfection of one's moves but also about the constant adaptation of one's performances to those of others. The face painting that is a derivative of an older form of Krumping, called Clowning, provides an explicit illustration of Goffman's notion of face-work.

We extended Goffman's notion of individual agency to incorporate collective aspects because in performance-based happenings like Krumping (not all dance art forms have these situative responses), the contributions of an individual to the artifact are part of a larger social enterprise, hence collective. Each performance alone does not make Krumping; it is the constant interplay between different dancers that shapes the performance. An analog in the networked world would be the Wikipedia, which is not constituted by one single entry of one author; instead it is the collective effort of hundreds of authors and their respective editorship that creates the content and the entity, or performance, of this information repository. The skills and knowledge needed to perform in such contexts are different from what is required of learners in small collaborative groups not only because the artifact itself changes but also because no member alone can assume the full responsibility of creating the artifact.

There are, of course, examples of learning environments and initiatives that have brought collective agency into classrooms and after school programs. For illustrative purposes, there are two that we would like to discuss in more detail: City Building education (Nelson, 1984) and the RoBallet (Cavallo et al., 2004). City Building Education uses the whole classroom to build a city of the future that is actually centered on the actual real estate of the school community's neighborhood. The yearlong curriculum encompasses all subjects from reading, writing, mathematics, science, art and social studies. Students organize themselves in different commissions that govern and negotiate different aspects of the city while designing the transportation, social services and building infrastructure. We selected this example because it illustrates how the whole class is in charge of the project, rather than small groups that work on subtasks of the problem at large. Leadership is shared and distributed over the course of the year and students actually have to live in their class through the consequences of a despotic mayor. The performance aspect of the city highlights another key element: while in the beginning of the school year, the land plots are empty, they start filling up with streets and building designed out of recyclables as do the government infrastructures where students write the laws that will govern the interactions in their city of the future. Each interaction depends on and influences the next one.

In contrast, the Roballet performance is more squarely located within the field of dance and illustrates how the design and interaction with robots can get dancers to think about their dancing in different ways. Here children design a dance performance not just using their own bodies but also by building in connections with robots whose movements they have design and control with their own body movements during the performance. The aspect that resonates mostly closely with Krumping is the interactivity between the dancers and the robots that mimics aspects of what Krump dancers do when they join the circle and interact with other dancers in their performances. These performances are not isolated acts but always in dependency to each other and thus enacted

emotions take on the veracity of role play. These examples provide us with pointers on what to pay attention to in our analysis of collective agency in the Krumping performances of urban youth. For one the activity structures illustrate that the design and implementation of the activity has multiple opportunities for entry in a time cycle and that activities are expandable and that there is room for innovation. For instance, each cycle of CityBuilding Education results in a different city or in the case of RoBallet, in a different ballet.

While the Krumping performances are based on collective interactions in which all members contribute as spectators and participants, there are two other features that are worthy of consideration: the cross-gender and cross-age participation. Krumping performances as observed in the Computer Clubhouse, but also in the community and theaters, involve all members of the community even though they are often portrayed as a youth phenomenon. Young and adult dancers join in the circle to share their energetic moves. Boys and girls alike participate in Krumping. From the outside, many of the dance moves appear to be aggressive, but the meaning assigned to the interactions varies with local contexts: community members use Krumping to vent their frustration and anger about the oppressive living situations in their neighborhood. Thus what may appear as aggressive to outsiders is in fact a reaction to oppression as the lived experience of insiders.

## **Context and Participants**

Over a period of four years, we have engaged as mentors and researchers at the design studio in South Los Angeles, California, seeking to better understand creative production, youth organizing, and the local culture. The Clubhouse is situated at a storefront location in one of the city's poorest areas and annually serves over 1000 high-poverty African American and Hispanic youth, mostly between the ages of 9 and 16. The Computer Clubhouse is not a stand-alone center; it is part of a local community organization and a world-wide network of over 100 design centers funded by the Intel® Corporation, designed to embody constructionist principles that acknowledge that youth learn best when they are actively engaged in design activities (Resnick, Rusk & Cooke, 1998). Although each center shares some similarities with others in the network, they are uniquely adapted to the local context through the help of the partnering community organization and Clubhouse coordinators. At this particular clubhouse, there is a rich assortment of creative software and various other artistic materials, such as digital cameras, microphones, and musical instruments, that are utilized by the Clubhouse members in an integrated fashion, oftentimes building on work created or recorded in one environment and altered in another. Youth have access to an impressive variety of software, including the Microsoft Office suite, Bryce 5, Painter 7, RPG Maker, and video, photography, and sound editing software. Additionally, designers can create or incorporate existing sound files, video, and other input/output devices, such as with homemade input/output devices, making design projects truly media-rich.

South Los Angeles is also the site where Krumping and Clowning originated. The mainstream media was first exposed to Krump in the 2005 movie, *Rize*, which documented the founders and other initial practitioners during the infancy of Krump as an art form. This new form of dance is popular among the youth in the area and is characterized by free, expressive and highly energetic moves. Youth will also elaborately paint their faces, dress, and obtain special haircuts for the dance performances – even those performances at the Computer Clubhouse. Krump has now spread internationally but still continues to evolve in the streets of South LA. It seems only natural then that the Clubhouse culture would be permeated by the local Krump culture at times. Indeed, as this paper documents, the Krump culture evolves in the Clubhouse space as youth merge their technology practices and their dance practices – each informing the other. The youth regularly created and filmed hundreds of dance videos at the Clubhouse ( $n > 250$ ), moving from dance to other aspects of production including recording, editing, and staging these events. The findings section of this paper documents and describes their work in greater detail. This paper serves to counter some of the common misperceptions of the community and showcases the Krump dance movement serves as one example of how the local community successfully orchestrates large, collective events. We will examine the Krumping performances in regard to three aspects: the nature of the activity itself, the division of labor in organizing and documenting performances, and the insider/outsider perspectives.

## **Clubhouse Krumping**

In the following, a series of smaller vignettes are used to describe how Krumping brings out the collective agency of the Computer Clubhouse members. The various facets of collective organizing are explored and presented with excerpts from the field notes and screen captures from the videos that the youth made and from videos made of the youth engaged in making the dance videos. The following is an edited version of several field notes that were written by four different mentors, describing the same day's events (05/02/06) at the Computer Clubhouse. These field notes provide a rich description of the Krumping Dance Videos and provide the context in which we want to discuss our notions of collective agency. In this first field note excerpt, the mentor comes into the room and notices a group of students around the computer. The mentor then discovers that the youth are working on editing a dance video from one of their previous dance performances. Kaylee

takes on the role of the editor, in part because she is the only one at the site with the technological know-how to do this.

*Viewing and Editing the Artifact.* When I first came into the clubhouse I noticed around 7 of the younger members crowded over one of the computers. They were all watching a dance video that they created last Thursday. I walked around and noticed that Kaylee wanted to look through the dance video and edit certain clips out. In the video, I saw a circle of members with one member dancing in the middle. The youth took turns coming into the middle of the circle to dance in front of the camera. The dances ranged from Krumping, to breaking, and other styles. The kids seemed really interested in the movie because they were debating what clips to keep and how to improve it.

One of the key organizational attributes of the dance is the idea of the circle. The circle has been prominent in dance cultures around the world but nevertheless is an important way for the youth to organize. By forming a circle while dancing, it places everyone on an equal plane until someone chooses to take the center of the circle, at which point they take the lead. This places an importance on individual agency. The editing of the video, additionally, becomes an important site for learning. The youth critique the performance, the camera angles, and the best way to edit the video. The contribution of the technology to this activity is twofold: (1) as an artifact for documentation and reflection beyond the ephemeral dance performance; (2) as an additional mode of expression beyond the dance itself, allowing for additional youth to participate in the viewing and editing process that may or may not have been in the original dance production.

*The Dance Performance.* After painting their faces, the youth were ready to record again. When the DJ played the song “Gimme That” by Chris Brown. ... two members, one African-American right around age 7 or 8 and another member...initiated the video and the rest were soon to follow. Each member went in front of the camera and started dancing. They all performed individually with different styles of break dancing, while the girls focused on incorporating the hip-hop like dance moves that were completely different in comparison with the boys. When they started recording, the younger members were very intrigued at being able to see themselves on screen and for others to see them as well. The younger ones would constantly take turns going in front of the camera, making funny faces or posing at different angles. I asked the older girls, “So what role do you serve in this project?” and Ebony answered, “Well we have to make sure that the younger ones know what they are doing. We can’t have them screwing up our dances by them just doing whatever. We have to keep them in line.” It was clear that these two knew their roles in the project, yet the group was still flexible enough to accept new members. I saw a brand new member getting in line with the other dancers.

The field notes point to some important aspects of collective agency. First, just as in the well-known Samba Schools in South America, there are multiple opportunities for apprenticeship. In this example, the older members show the younger ones how to participate and structure the activity through their efforts to choreograph the dances and keep the younger members in line. However, in one of the later field note excerpts the reader will see that this type of top down mentorship isn’t always the case. Breona, one of the youngest members, is actually the star dancers and the other members learn from and are inspired by her dance moves.

### **Critique & Expertise**

The judgments of the quality of dance invite critique – for better or worse of how successful a particular dance move or how expert the member is in Krump technique. This next excerpt demonstrates that the younger members have a valuable contribution to the innovation in the activity.

*Critique, Expertise & Self-Confidence.* While the younger members were performing the older ones watched and critiqued, giving opinions or laughing at the boys who “danced funny” or “looked retarded.” After the song was over they decided to ask one African-American girl, named Breona to participate in the video. She mentioned that she needed to hear a different song and suggested a song by Missy Elliot called “Lose Control.” She was so good, it was no wonder why the guys were so intimidated by her. The other members also acknowledged the younger members that were good dances. Breona was complimented on her dance moves. She received comments like “dang that girl can dance,” from the older members. Her dance moves were more crisp and fluid than the other 2 girls. I was greatly impressed at how talented Breona was. She was way more proficient at dancing and had more confidence than any of the

other girls. One of the other girls, Ebony, who was in charge of the choreography for the girls, was very outspoken and seemed like she could dance really well, but when it came down to performing for the music video, she became very self-conscious and seemed to dance poorly on purpose. Ebony was older than Breona, yet because of Breona's carefree viewpoint she was able to perform with ease.

This excerpt points to the multiple opportunities for innovation – a highly valued contribution in Krump culture. The activity itself is open enough to allow for infinite degrees of innovation both in the filming and in the choice of dance moves – a high ceiling – and yet allows for new members without much experience to be involved as well – a low floor. The structure of several consecutive dances, each only a few minutes in length, allows for members to enter and leave the activity as needed. This feature also allows for multiple entry points, in case it takes the kids a while to warm up to the activity. In addition, the Krump culture, similar to what was found in the Samba Schools initiative, allows for and encourages cross-gender and cross-age participation. The youth are united by their shared goals: the performance and the documentation. Finally, the activity itself is easily expandable from a group of 6-7 youth to a group of 30 youth at times and leads to multiple ways to contribute to the activity.

### **Division of Labor**

The Clubhouse dance video activity presents multiple opportunities for youth to draw upon their individual areas of expertise and take on strong leadership roles (see Figure 1). In the following field note excerpt, the division of labor is explored. Several of the youth take on leadership roles, including Dwight and Javan, as the producer and director respectively. In addition, there are several other roles that youth step up to fill, including the role of DJ (FAFA), make-up artist (Javan), choreographer (Ebony), and editor (Kaylee), and dancers (e.g., Breona and several College mentors). Each of these roles is interdependent on the other.

*Roles.* The dance group included only 3 girls, all of whom were African-American. The rest of the group contained 6 boys, both African-American and Latino. One of the older members, Javan, took on the role of the director. I talked to Javan earlier and he said that he did all the planning and face painting. All of the boys in the group had their face painted with different designs by Javan. Though Javan organized the sequence of events for the music video, each member involved had their own role. There was a designated role for each member: One was the DJ in charge of the music, another was in charge of recording the video, another was the producer, another the choreographer, another was the editor, and the remainder were dancers.

Although the collective activity can take place in the absence of any one member, because the leadership is distributed, each member plays an important role in shaping the project. Roles are divided up according to interest and ability. For example, Kaylee's knowledge of the video editing software facilitated her involvement in the group as the editor.



**Figure 1.** Three images demonstrating the division of labor the Clubhouse Krump Culture. From left to right, the first image is of Javan downloading the music, the next is of Dwight who directed some of the production and controlled the camera, and final image is of Kaylee editing the videos.

### **Insiders vs. Outsiders and Aggression in the Dance Culture**

Learning to Krump and participating in the dance events requires some basic cultural knowledge and an understanding of the shared importance of the event. Despite being a fairly open group, and this is where a sense of agency comes in when an individual chooses to participate in the dance activity or not, the activity is not necessarily understandable to cultural outsiders. In fact, the aggressive qualities of the dance and the acted battling that sometimes takes place during dance offs or visual displays of anger can be frightening to outsiders that don't understand the cultural meaning behind these activities. The members themselves share an understanding of the importance of the activity and accept these displays of violence as a form of expression and

not of aggression. In sum, Krumping knowledge is situated and context-specific: insiders in the activity see the visual displays as countering feelings of oppression while outsiders see it as a form of aggression. While the context varies, this seems to be the case with most collective activities. Members join together because of a shared interest and knowledge of an activity that is not shared by everyone (e.g., World of Warcraft), and outsiders to the activity see it as deviant or unhealthy (e.g., videogame addictions and violent proclivities). This tension between insiders and outsiders in collective activities is highlighted in the following two field note excerpts, both written by Latino males that were Undergraduate mentors at the field site during this same time.

*Insider.* I was especially surprised when I saw her dancing as if she was calling out one of the members to battle her...Breona got right in Dwight's face and pretended to be slashing him and ripping him apart through her battling. This whole idea of women being nice, and sweet and not really showing hostility but tranquility was completely false. This young girl was ready to challenge any male who challenged her way of dancing because she knew that she confident enough to challenge the boys to dance. At one point I decided to come into the film and relive my youth. I did a few break-dancing moves. The kids seemed to have enjoyed watching me dance because they were cheering me on.

*Outsider.* One of them asked me if I could dance, I just nodded my head (to signify "no"). I tried to get FAFA's attention but I called him FAT FAT. (O.C. I guess that I misheard his name because Kaylee and her friend laughed at that and repeated what I had said. FAFA seemed embarrassed. He smiled but he wasn't laughing and he seemed quieter than usual). I then noticed that the kids were dancing. They formed a circle, like in the video. I then saw two members, Daniel and FAFA play fighting. I wasn't sure what to do at that point, but I noticed that Clubhouse Coordinator looked over, laughed, and remarked, "Those boys are crazy." Her reaction made me feel that it was okay that they were doing this. I love the fact that they are bringing music into the clubhouse in this manner but it makes me feel uncomfortable that they were play fighting. I guess I didn't say anything because it seemed okay with the Clubhouse Coordinator.

The mentor that is characterized as the insider uses terminology specific to the event (e.g., battling), participates by dancing (albeit breakdancing and not Krumping), and reads Breona's aggressive gestures as empowering her as a female. By contrast, the mentor that is characterized as an outsider in this activity system is unsure of how to read the social context, relies on cues from an authority figure to know what is and is not appropriate, does not participate in the dance, and mistakenly calls the youth by an insulting version of his rapper name. Surprisingly, this mentor has been involved for over a year at the Clubhouse while the insider mentor is new to the Clubhouse activities. Ironically, this activity, in contrast to most of the work at the Computer Clubhouse which can sometimes end in frequent feuds and hurt feelings, did not inspire and verbal or otherwise fighting amongst the members. In fact, the field notes revealed that the dance videos rallied the members and created a sense of community in the space. During the peak of the dance video movement, attendance was at an all time high, the place was filled with music, and all of the youth were engaged in some aspect of creative production related to Krumping.

## Discussion

In this section, we return to the initial mission of this paper which was not only to describe and analyze features of collective agency but also to consider what kind of insights we can gather for designing collaboration in larger groups, hence collectives. Our observations and analyses of Krumping and clowning indicate several distinct features from traditional small group collaboration. For one, we observed that members assumed multiple roles, and did so fluidly as they shifted from participants to observers to directors to editors and back. At least on the outset, there seemed to be less a hierarchy based on authority of age even though some club members pointed out that they needed to make sure that the younger ones knew what they were doing. Instead, more full forms of participation seemed to derive also from the dance performance itself and so even younger members could assume authority they otherwise would be denied in more traditionally organized settings. Most small group collaborations have roles assigned even if participants cycle through them; here members adopt whichever role is needed and available like when they move in and out the circle during their Krumping performances.

Based on these observations we can say that one aspect of collective agency is to assume multiple roles; these roles are not prescribed though members are valued and recognized in the community for their particular abilities (see Dwight the producer). Such changes in participation (see Rogoff, 1995) are also part of communities of practice and often assumed for successful collaboration in small groups. Perhaps it is the prescriptive nature of assigned roles in small group collaboration that seem to make it difficult for members to

adopt the fluidity needed to function and perform and larger collectives. In fact, we have little research if any that focuses on unstructured group collaborations as observed in the Krumping community (Cohen, 1994) in contrast to the hundreds of studies that focus on various features of structured group arrangements.

The adoption of multiple roles also brings another factor into play that is the learning benefits associated with this arrangement. Part of Krumping performances is not just a repetition of one's established routines but a constant integration of other people's moves. As such performances are never the same but vary and are sensitive to the local context and time. Learning from others is thus built into the performance. This form of learning requires paying careful attention and being responsive to what others are doing. This stands very much in contrast to the often formulaic strategies promoted in collaborative groups that, for instance, divide text comprehension into smaller components and then have learners practice every single one of them (Brown & Palincsar, 1986). In Krumping the "text" is always changing as members invent and modify their moves. The history of this dance form is a testament how different variants have developed from Clowning to Krumping and continue to change (Rize, 2005).

Finally, we also need to address the performance aspect of Krumping because it is in the actual enactment that moves are generated and modified; these changes are not practiced or determined beforehand. The idea that learning needs to result in tangible products is surely not new and has garnered much credence with the advent of project-based learning and its focus on authentic practice. A key idea in these projects that are often worked on in smaller groups is that the final outcome is an artifact that bears some connection to professional practice. One may wonder whether here is the dividing line between the arts and sciences: in Krumping (which is not like all forms of dancing) the artifact is in constant flux while in science-oriented projects artifacts may differ but result in some stable form at the end. Perhaps newer forms of knowledge constructions such as the Wikipedia tap more into similar types of final products that are never finished; each entry is under constant observation as members add new content and then remove other content. While there is considerable debate in the scientific community about the sourcing and correctness of these entries compared to more traditional authoritative handbooks, the reception and contributions speak to the success of collective authorship and editorship. Researchers like Amy Bruckman already experiment with these new forms of writing collaboratives – or collectives – for science learning (Bruckman & Forte, 2006).

Our observations at least seem to suggest that it might be worthwhile for Learning Scientists to pay attention to collective agency in addition to collaboration. From our analyses it is clear that it's not just a simple matter of involving larger number of participants but also of considering the nature of activities, the roles that participants will assume, and the performances or artifacts that present the culmination of efforts. In the same way that Lave and Wenger (1991) stepped outside of school to understand learning by examining different types of apprenticeships, we suggest that learning sciences researchers consider subject areas other than mathematics and science to broaden their applications. The learning technologies, activities, and environments that we design are greatly influenced by how we think about learning as a socially situated activity.

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