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The Computer Clubhouse: A Place for Youth

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I decided to come to the Computer Clubhouse to learn all other different things that I didn't know. Now I know a whole bunch about computers and programs like Adobe. I stay about 3 or 4 hours. I work on projects. I like to learn new things and make new projects, I especially love to make Pearls and trace pictures of Bart Simpson. You learn a lot of things about computers, that's the fun part . . . try to make a lot of projects about you and other people . . . . Actually, I'm not really good at solving good problems. I know that I can't 'cause I try and try but still can't. At least I try. . . . I help people at school, when we have a computer and something happens or if something is wrong . . . . [I'm] really, really, really, really good at learning things since coming to the Clubhouse.

—Susan, age 10

Me personally, during school I had nowhere where my skills were useful. This is a place I can actually use my skills, like art and 3-D modeling and painting, drawing. It is a wonderful place to, you know, gather around. In a few words, I find it intellectually stimulating. I learn from everybody and they learn from me.

—Anthony, age 11

When I came to this Clubhouse I didn't know how to do [it] . . . but when I did my first project, I found out programming was for me. This is easy when you have a great imagination and when you put in dedication . . . and for everyone who likes to create and use their imagination for expressing themselves.

—Caro, age 15

This book is about the Computer Clubhouse—the idea and the place—that inspires youth to think about themselves as competent, creative, and critical learners and citizens. These are words we rarely hear mentioned in connection with urban youth who are often perceived as causes for concern rather than empowerment.

But this needn't be. There are many examples that showcase today's youth as engaged and thoughtful contributors to society (Leventhal & Brooks-Gunn, 2003). One such place where this occurs within the context of technology is the Computer Clubhouse, which provides a home for youths' creative interests and their personal and intellectual development. By promoting creative and design activities with technology, the Computer Clubhouse bridges the Digital Divide and provides youth with access to key twenty-first-century learning skills. But more than computer skills are at stake. As the quotes given above of Computer Clubhouse members illustrate, they see themselves empowered to learn and help others, to become members of a community, and to develop a vision for their futures.

During the past decade, more than 2,000 community technology centers have opened in the United States, specifically to provide better access to technology in poor communities (Beamish, 1999; Warschauer, 2004). But most community technology centers support only the most basic computer activities such as word processing, e-mail, and Web browsing (Servon & Nelson, 2002). Similarly, many after-school centers (which, unlike community technology centers, focus exclusively on youth) have begun to introduce computers, but they, too, tend to offer only introductory computer activities and educational games (e.g., Cole, 2006; Hirsch, 2005; Zhao, Mishra, & Girod, 2000). What is new and different about the Computer Clubhouse is the focus on creative uses of technology, where youth are encouraged to work on projects of their own interest, including animations, games, videos, and music with professional-level software tools and support from interested and knowledgeable mentors.

The Clubhouse idea that youth should engage in creative activities with technology drew its inspiration from Seymour Papert's theory of constructionism, which postulated that an individual learns best when making artifacts that can be shared with others and that computers offer privileged ways for children to do so (Papert, 1980; Kafai, 2006). As computers moved out of the laboratory into homes, making technology available was seen as more important than anything else given the widely documented inequities in schools and homes in low-income areas (Sutton, 1991). Yet Mitchel Resnick, Natalie Rusk, and Stina Cooke, the founders of the Computer Clubhouse, argued that "access is not enough," (Resnick & Rusk, 1996a) pointing to a need to focus on developing skills and creative expression with computers. Supported by Papert's ideas, the Clubhouse founders pushed way beyond access toward the need for equitable and creative participation in technology. To be able to participate in the digital culture means more than just knowing how to use computers; you also need to be able to create and contribute your ideas.

Today, we are much more comfortable with the notion of youth as creators and participants in the digital culture. Millions of youth participate in networking sites, games, and virtual worlds. So much of their social life has moved online that participation in the digital public has become an essential part of youth identities and their social lives. Places like the Computer Clubhouse play an important role because they give a creative outlet to youth who find that much of what is important to know and do in the digital culture is not valued in their schools. Inner-city youth perhaps experience this disconnect in more dramatic ways, as

they are often perceived as standing on the sidelines of technology culture. Schools that service youth in low-income areas typically have few technological resources and community or curricular connections, leaving young people alienated from the formal education system (Leventhal & Brooks-Gunn, 2003). In addition, with a resurgence of the back-to-basics movement currently underway, youth have few opportunities to creatively or critically develop. Art classes, computer science classes, and any type of liberal arts education have been stripped from the nation's poorest schools. After-school centers like the Computer Clubhouse can serve as an important "middle ground" between home and school, providing a comfortable, supportive, and safe space for youth to explore new ideas and develop new skills that are outside the scope of the current schooling curriculum (Hirsch, 2005). Not only does the Computer Clubhouse make an important contribution in local communities, it also serves as a model for other after-school places with its constructionist philosophy.

THE IDEA: CONSTRUCTIONIST THEORY IN CLUBHOUSE PRACTICE

Constructionism views learning as building relationships between old and new knowledge in interactions with others while creating artifacts of social relevance. Papert (1991) once stated:

> Constructionism—the N Word as opposed to the V word—shares constructivism's connotation to learning as building knowledge structures irrespective of the circumstances of learning. It then adds the idea that this happens especially felicitously in a context where the learner is consciously engaged in constructing a public entity whether it's a sand castle on the beach or a theory of the universe. (p.1)

Several aspects of the Computer Clubhouse embody these ideas of knowledge construction in the design of the activities, materials, space, and pedagogy that constitute the learning culture.

For Papert, artifacts or objects play a central role in the knowledge construction process. He coined the term "objects-to-think-with" as an illustration of how objects in the physical and digital world, such as programs, robots, and games, can become objects in the mind that help to construct, examine, and revise connections between old and new knowledge (Papert, 1980). Playing and interacting with these objects is an important aspect of knowledge construction. The kind of project making promoted in the Computer Clubhouse Network takes on this role of objects-to-think-with, allowing members to engage with technology, problem solving, and artistic expression in profound ways.

An example of what the principles of constructionism look like in action can be found in familiar construction kits like LEGO bricks, Lincoln Logs, or wooden blocks. Papert carried over this type of learning activity into the virtual realm when he designed the Logo software. In the constructionist tradition the Logo software is a form of computational construction kit that allows programmers to design or construct their own software programs to create games, animation, or

art. LEGO Mindstorms extend these constructions into the robotics domain, allowing the creation of cars and animated sculptures. Many of these construction kits are found in Computer Clubhouses to provide members with various creative tools to design and implement their own projects. In Chapters 3, 4, and 12, we will describe some new construction kits, such as Scratch, specifically designed in this tradition for the Computer Clubhouse.

Unlike school projects, which might have prescribed procedures and single solutions, Clubhouse artifacts or objects can be developed in an exploratory fashion, at times without a specific end product in mind. Many Clubhouse projects promote an improvised bricoleur-like approach in which a member tinkers around with problems and assesses different solutions until finding an appropriate one. This approach is nothing like a top-down or formal planning approach often favored in the school that sees each step as a smaller stepping stone toward a more advanced construction (Turkle & Papert, 1990). There are also no teachers in the Clubhouse who instruct members about how to complete their projects. This emphasis on learning, and not teaching, often aligns constructionism with discovery learning (Kafai, 2006), which asserts that learning happens as children interact with a carefully considered learning environment without the use of direct instruction. By extension, a common myth associated with constructionism is that any guided instruction is inappropriate for learning. As we found out in our research in Computer Clubhouses, the creation of a design culture requires substantial support and direction from Clubhouse coordinators and mentors, less so in telling Clubhouse members what to do but more so in helping them develop their own ideas.

For that reason, coordinators and/or mentors play important roles of guides, coaches, and colearners who provide Clubhouse members with just-in-time technical expertise or motivational support along the way. The Clubhouse mentor model is a key part of the Computer Clubhouse culture, and handbooks for new mentors often stress these important distinctions between teaching and mentoring (see Chapter 8). These learning relationships that members build with mentors are essential to constructionist learning and the success of the Clubhouse culture (see Chapters 10, 11, and 12).

In many ways, the Clubhouse represents a constructionist learning culture that creates a supportive space for its members to design, build, and share their projects and ideas. Papert always stressed the importance of learning cultures rather than individual activities or tools (Papert, 1980; Zagal & Bruckman, 2005). For him, learning French was best done while being in France; all other means and approaches are poor approximations of not only what it means to speak but also to be French. As such, the Computer Clubhouse creates a technology culture that members can join by speaking the language of technology in creating, building, and sharing their projects—very much like professionals do in their design studios. In the Clubhouse, members are users and creators of technology culture and become immersed in its critical and creative aspects. The idea of creating spaces for youth to have access as well as become technologically fluent ultimately formed the foundation of the first Computer Clubhouse.

THE PLACE: A LOOK INSIDE THE CLUBHOUSE

Beginnings

The first Computer Clubhouse was founded in 1993 by the MIT Media Lab and the Computer Museum. The Clubhouse was started after exhibit designers observed youth sneaking repeatedly into exhibits to spend more time with the toys and tools for making games, robotic designs, or graphic animations. Thus the idea was born to have a space that could be a "creative invention studio" where young members learn by doing, working closely with adult mentors as they explore new ideas, express themselves through their project designs, and increase self-confidence and leadership skills (Resnick, Rusk, & Cooke, 1999). In the following years, several new Computer Clubhouses were established mostly in the Boston area with the support of a variety of corporate, foundation, and individual sponsors. These Clubhouses were based on the original Computer Clubhouse, now called the Flagship Clubhouse, located at the Museum of Science in Boston, Massachusetts. Four guiding principles informed the development of new Clubhouses, providing a lens through which to understand and implement the learning model:

1. Support learning through design experiences;
2. Help members build on their own interests;
3. Cultivate an emergent community of learners; and
4. Create an environment of respect and trust.

In 1999 Intel Corporation announced it would sponsor the opening of 100 new Clubhouses throughout the United States and around the world, using the Clubhouse learning model. Community organizations were chosen to host Computer Clubhouses based on their existing interest in providing technology to youth and their alignment with the guiding constructionist philosophy. Therefore, each Clubhouse is a part of an existing local community organization as well as a part of the worldwide Computer Clubhouse Network with over 100 Clubhouses. These Clubhouses are situated in some of the poorest communities on the globe, and, to better service their community, membership in a Computer Clubhouse is always free.

Two thirds of today's Clubhouses were started with support from Intel and the remaining Clubhouses with support from other companies, government agencies, and individuals. The intent was always that the individual Intel-sponsored Clubhouses would have their host organizations take over fund-raising responsibilities after the initial start-up period. Intel-sponsored Clubhouses started with 4 years of support, with diminishing support from years two to four. More recently, that model has been changed to 2 years of start-up support with a second year of diminishing support. That model has been largely successful. Of course, some host organizations have struggled with fund raising, although they had initially indicated they had the means and intention of taking over fund raising necessary to sustain their Clubhouse. As of today, all Clubhouses—whether established with Intel funding or not—are funded through their own fund-raising efforts. Cur-

rently, Intel does not fund individual Clubhouses but rather supports the activities of the Computer Clubhouse Network—including start-up support, professional development for Clubhouse staff, ongoing program assistance, quality assurance, evaluation and assessment, and marketing support.

Location and Design

Across the globe, at least 90% of Clubhouses are located in urban areas; a few are located in rural areas including two on Native American land in the United States. Clubhouses are located in underserved communities of mainly poor, working-class, or immigrant populations. Despite the fact that Clubhouses are located in impoverished areas, all youth who come through the door have access to high-quality equipment, ranging from cutting-edge software to professional desk chairs. Clubhouses possess, on average, 20–25 computers organized in clusters along the walls, with 3–4 computers in each cluster. The cluster design and the fact that youth can easily roll their desk chairs between stations facilitate sharing and collaboration. The software that youth have access to include, but is not limited to, Microsoft Office, Bryce 5, Kai's SuperGoo, Painter 7, RPG Maker, Adobe Photoshop, Scratch, and other video, photography, and sound editing software. Around the room, there is usually a rich assortment of materials in addition to computers, such as digital cameras, microphones, markers, paper, or acoustic instruments. These materials are utilized by the members often in an integrated fashion, that is, building on work created or recorded in one environment and altered in another. There are other objects in the space to inspire youth to build and play, including videogame systems, LEGO building blocks, recycled materials, outdated technologies for youth to disassemble, and various board games. Frequently, Clubhouses also include music studio rooms equipped with musical instruments and professional-quality software for youth to create, record, and edit original music. At most Computer Clubhouses, the computers are networked to a central server, where youth have a personal folder that serves as a digital sketchbook or image archive, as well as a repository for finished work. If a central server is unavailable, youth create personal folders on the desktop in a similar fashion.

Members

Each Clubhouse serves close to 250 youth, most coming from working-class families and disenfranchised communities. One or two full-time coordinators staff each Clubhouse, along with a handful of supporting staff and mentors. As a drop-in program, at any given moment there can be anywhere from 5 to 45 youth in the space who stay between 45 minutes to over 4 hours. Walk into any Computer Clubhouse and you're likely to find groups huddled around a central green table, serving as the common area for youth to work away from the computers with paper, pencils, markers, or electronic parts.

Not all youth come to the Computer Clubhouse to engage in the same activities. There are rappers who can consistently be found in the music studio, gamers who participate in any permissible gaming activity (i.e., Xbox games, board

games, and Internet games), animators who can usually be found in the back corner doing stop-action animation shorts, socializers who are present in the studio but drift in and out, Web surfers who frequently enjoy surfing the Internet, artists who choose to create with more traditional visual art materials, and scholars who can be found at the green table working on homework or at the computers doing research for a school project. Most youth participate in multiple groups, at least casually. Although most youth end up becoming designers, animators, or rappers, these groups require time and knowledge of the specific practices to fully partake in these activities. Consequently, most newcomers begin by building on their existing identities as gamers, scholars, surfers, or socializers. Long-term members typically begin embracing the Clubhouse norms of valuing the production over the consumption of technology and begin creating a portfolio of work.

The Network

Over 15 years after its inception, the Clubhouse Network continues to expand as applications to join the network keep pouring in from around the world. The title "Computer Clubhouse" is reserved for those spaces within host organizations who successfully apply for Clubhouse status and agree to adhere to the following requirements:

- Have a dedicated, separate area of at least 1,100 feet for the equipment, furnishings, and Clubhouse staff space
- Assign a full-time coordinator for 40 hours per week
- Enter into a licensing agreement with the Computer Clubhouse Network
- Provide suggested features in the Clubhouse learning environment, including computers in clusters and not in classroom style, a central table as a gathering place, chairs on wheels to encourage collaboration, and exhibit space for youth work
- Adhere to Computer Clubhouse guiding principles
- Serve youth weekdays after school and weekends (a minimum of 20 hours per week)
- Provide opportunities for open-ended exploration during that time (versus classes with a fixed curriculum)
- Provide high-end professional software for creative expression and scientific exploration (versus computer games for entertainment only)
- Ensure youth from underserved communities have access to the program
- Encourage the participation of adult mentors who can serve as role models and support the development of a sense of community
- Participate in the broader Clubhouse community through membership in the Intel Computer Clubhouse Network

What makes the Clubhouse unique from other after-school programs is the focus on youth ownership. Clubhouse members take ownership of the space and their projects. Members determine what projects are of interest to work on and how far to pursue them. Additionally, ownership of the space imbues responsibil-

ity for governance of that space. Social rules and norms, when necessary, are developed together with the Clubhouse members and staff. Another unique aspect is the interactions between members and mentors. Mentors are not only present to support members' project work; mentors are also present as learners, who work on their own projects as well. Clubhouse members learn as much about learning and project design strategies as they do about the software tools.

PORTRAITS OF THE SITES

Two particular Clubhouses receive special attention in this book, one in Los Angeles (Chapters 3, 7, and 11) and the other in Boston (Chapters 1, 4, 6, and 10), and serve as extended case studies. We delve into the specific programs, outcomes, and case studies at these two sites, providing insight into the particulars of their operations. From 2003 to 2008, Yasmin Kafai, Kylie Peppler, and others in this volume engaged in participant ethnographic research as mentors and researchers at the Youth Opportunities Unlimited (Y.O.U.) Inc. Computer Clubhouse in South Los Angeles, California. This particular Clubhouse is situated in a storefront location in one of the city's poorest areas and equally serves over 1,000 high-poverty African American and Latino youth, many of whom are bilingual. At this Clubhouse, members range in age from 8 to 18, but most are between the ages of 10–14 and come from working-class families. About 45% of members are female. The three Clubhouse coordinators are leading members of the South Los Angeles community and had a prior relationship with the host organization. The majority of the mentors assisting in this Clubhouse are from outside the community, introduced through field experience requirements associated with an education course taught at the University of California at Los Angeles. This Clubhouse was of interest to us as a test site for expanding the repertoire of youths' media manipulation to include programming practices. Proof of a programming culture taking root at this site was recorded between fall 2004 and winter 2006; a closer look at youths' work in this area is presented in later chapters.

From 2002 to 2006, Robbin Chapman and colleagues from the MIT Media Lab were involved in conducting ethnographic research and workshops at the Flagship Computer Clubhouse located in Boston, Massachusetts. Housed in the Museum of Science, it is attended every week by about 250 youth ages 10–18 years old. Over 40% of members are female and Flagship Clubhouse members are from predominantly poor and working-class families. A full-time Clubhouse coordinator, who has been in that role for over a decade, is on staff. A part-time coordinator who is also a member of the Clubhouse Network staff attends on Girls' Day, every Monday. Clubhouse mentors are primarily university students and professionals from various industries, including technology, arts, and business. One of the research projects examined how Clubhouse youth engage in critical reflection, articulate their design work, and how this impacts learning relationships with their peers. The technology development and research approaches and findings are presented in later chapters.

At the same time, this book attempts to paint a picture of the entire network—admittedly, an almost impossible task. The remaining chapters in this book focus

on other Clubhouses sprinkled across the globe and provide insights into the on-line network of Clubhouse members and mentors. A table is provided here that summarizes information for each of the featured Clubhouse sites for further refer-ence and comparison (see Table I.1). Each Clubhouse in the network is unique, and naturally there are many that could not be featured here due to space limitations. By focusing in on a few specific sites, we are able to give some depth into certain Clubhouse sites and in the final section, "Showcasing Successes," we are able to give the reader a better sense of the breadth of the network.

THE BROADENING IMPACT OF THE NETWORK

The growing, worldwide network of Computer Clubhouses has continued to find ways to deepen the learning experiences of its members by developing programs to address their needs. Programs that focus on encouraging girls to use technology, on career and college preparation, and on coordinator professional development have all come out of lessons learned about supporting the various needs of those at the Clubhouse. As more Clubhouses were added to the network, it became vital to connect these members across the network through Teen Summits, coordinator retreats, and an online community to ensure that a sense of community is pre-served across the network. As of 2008 the Clubhouse Network had hosted four Teen Summits, serving over 800 Clubhouse members from 20 countries. During the weeklong summits, members work together on projects that address their vari-ous communities' challenges. They also get to network with local engineers, musi-cians, writers, scientists, programmers, animators, and artists. The goals of these programs are to encourage members to see a more expansive, productive future than they may have imagined before joining the Clubhouse.

Professional development of Clubhouse coordinators is an equally vital factor in providing a learning environment that supports creative learning through de-sign activities. As new Clubhouses continue to come online and new coordinators are trained, it becomes even more critical to provide a space where professionals from all Clubhouses can connect. The Computer Clubhouse Annual Conference brings together over 100 Clubhouse staff from around the world to share lessons learned, develop strategies to better support the Clubhouse learning model, and plan for the continued growth of the network. More localized regional workshops take place to keep up the momentum generated at the conference and institute strategies in ways that are relevant to a particular region. Regional coordinators travel between the sites, offering professional development and regular assistance to individual Clubhouses.

A need to connect Clubhouse members, mentors, and coordinators from across the network fueled development of a private intranet, called the Clubhouse Village, where projects and creative ideas can be shared. The Village is an online portal designed to augment the learning experiences of Clubhouse members by connecting them to members from other neighborhoods, cities, and countries, which value the guiding principles of Clubhouse learning. The Village features so-cial networking and communication tools and virtual project galleries, and hosts network-wide learning events and activities. At the time of publication, there were

TABLE I.1. Computer Clubhouse Sites Featured in This Book

Featured Clubhouse	Clubhouse Location	Local Host Organization	Date Founded	(Total Members) Avg No. of Members	Average Member Ages	Languages	Demographics	Member Socio-economic Status	Referenced Chapter(s)
Amman	Amman, Jordan	Princess Basma Resource Youth Center	2004	(120)	10–16	Arabic, English	Middle Eastern		
Bailey	Falls Church, VA, USA	Fairfax County Department of Community and Recreation Services	2002	(80) 15/day	13–16	English, Amharic, Spanish, Somali	African-American, Middle Eastern, Ethiopian, Somali, Latino	Working class, poor	
Belfast	Belfast, United Kingdom	Springvale Learning Center and Greater Shankil Partnership (site 1); Spectrum Centre (site 2)	2005	(380) 50–65/day	10–17	English	Caucasian	Working class	
Charlestown Boys & Girls Club	Charlestown, MA, USA	Boys and Girls Club of Boston	2001	(70) 20/day	10–16	English, Spanish, Portuguese	African-American, Latino	Working class	5
Flagship	Boston, MA, USA	Museum of Science	1993	(244)	10–18	English/Spanish	African American, Latino, Portuguese, Asian	Working class, poor	1, 4, 6, and 10
Gum Springs	Alexandria, VA, USA	Fairfax County Department of Community and Recreation Services	1998	(67)	13–16	English, Amharic	African American, Ethiopian, Kenyan	Working class, poor	
HCCI	New York, NY, USA	Harlem Congregations for Community Improvement	2002	(150) 25/day	10–15	English	African American	Working class, poor	
James Lee	Falls Church, VA, USA	Fairfax County Department of Community and Recreation Services	2004	(100) 15/day	13–17	English, Amharic, Spanish, Somali	African American, Middle Eastern, Ethiopian, Somali, Latino	Working class, poor	

TABLE I.1. *(continued)*

Mott	Fairfax, VA, USA	Fairfax County Department of Community and Recreation Services	2004	(199)	12–16	English, Amharic, Spanish, Somali	African American, Middle Eastern, Latino, Ethiopian, Somali	Working class, poor, middle class	
Ramallah	Ramallah, Palestine	Youth Development Association	2003	(90)	12–17	Arabic	Middle Eastern		
Reston	Reston, VA, USA	Fairfax County Department of Community and Recreation Services	2004	(74)	12–17	English, Spanish, Arabic	African American, Middle Eastern, Latino	Working class, poor	
Suba Compartir	Bogotá, Colombia	Fundacion Compartir	2002	(135)	8–16	Spanish	Latino		
Tacoma Computer Clubhouse	Tacoma, WA, USA	Allen Renaissance Inc.	2001	unknown	13–17	English, Spanish	African-American, Latino	Working class, poor, homeless	
Willston	Falls Church, VA, USA	Fairfax County Department of Community and Recreation Services	2003	(94)	13–16	English, Amharic, Spanish,	African American, Middle Eastern, Ethiopian, Somali, Latino	Working class, poor	
WYTEC	Chicago, IL, USA	Westside Youth Technical Entrepreneur Center	2008		10–16	English	African American, Latino	Working class, poor	3
Y.O.U. Inc.	South Los Angeles, CA, USA	Youth Opportunities Unlimited Inc.	2005	(1000) 30–45/day	10–16	English/ Spanish	African American, Latino; 45% female and 55% male	Working class, poor	3, 7, and 11

more than 10,000 members of the Village. What started out with one Clubhouse has now grown into an international community.

OVERVIEW OF THE BOOK

The chapters that follow present the intellectual foundations and inquiry that have emerged from our documentation of the theory and practice of the Clubhouse model, our research investigating the creative work produced at the Clubhouse and the collaborative relationships that occur there, and an evaluation of the impact of these activities. All youth and most mentor names have been replaced by pseudonyms (first name only) throughout the book. All Clubhouse staff, however, have chosen to be identified by name. Actual names of individuals are indicated through the presence of both a first and last name when first introduced and subsequently by their last name.

The first part of the book presents a detailed portrait of the Clubhouse model, highlighting its history, guiding principles, and now global identity from multiple perspectives. Chapter 1, by Natalie Rusk, Mitchel Resnick, and Stina Cooke, begins this conversation with a discussion by the founders of the first Computer Clubhouse, who recount the origins of the Clubhouse and outline the genesis of the four key principles that have become the blueprint for other Clubhouses. In Chapter 2 Patricia Díaz, the knowledge manager of the Clubhouse Network, describes the Clubhouse Village and associated community activities. She uses an international Clubhouse project around Cosmo, a puppet that traveled to Clubhouses around the network, to illustrate how members collaborate across geographical, language, and cultural boundaries. Chapter 3, by Kylie Peppler, Robbin Chapman, and Yasmin Kafai, presents a digest of interviews with community organizers, Network staff, and Clubhouse coordinators from across the globe to illuminate how they define their unique roles and how infrastructure and activities create a support system for the Computer Clubhouse model.
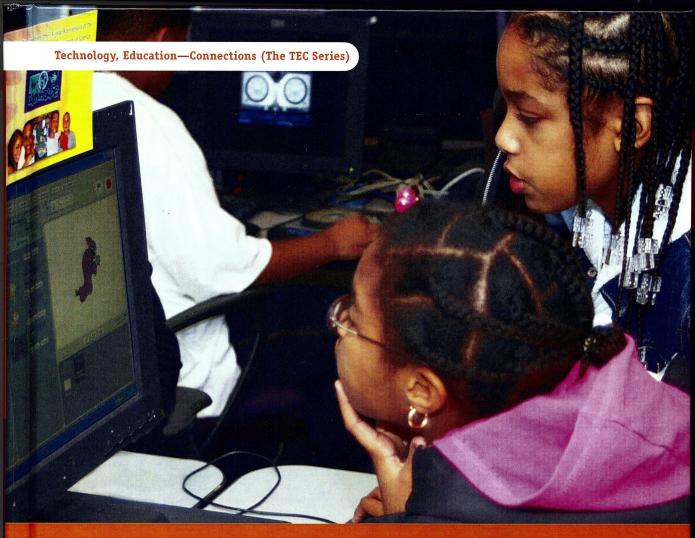
The second part, "Creative Constructions," extends our discussion into the projects created in the Computer Clubhouses. These projects are at the heart of Clubhouse activities and our focus is as much on describing the project activities as the kind of learning that goes on while making them. In Chapter 4 Kylie Peppler and Yasmin Kafai showcase games, art, and animation projects created with Scratch, a media-rich design software specifically developed for the Clubhouse, and illustrate how youth appropriate the new software at multiple levels. Amon Millner continues in Chapter 5 by sharing the work from the Hook-ups initiative, where young people learn about interface design, programming, and science concepts by designing and constructing "Hook-ups," real world objects made from recycled or craft materials that can control games, animations, and other computer programs in Scratch. In Chapter 6 Kylie Peppler and Yasmin Kafai examine dance performances to illustrate how Clubhouse members include local dance practices such as Krumping and Clowning in their media productions. After Chapter 6 we include a collection of color plates that illustrate different Clubhouse spaces, examples of youths' projects specially selected by Network staff for inclusion.

The social context for learning at the Clubhouse is featured in the third part, "Collaborations in the Clubhouse Community." At the Clubhouse, learning happens within a complex social network of members, mentors, and staff. This section begins with how members reflect on their projects and share learning insights. In Chapter 7 Robbin Chapman reports on how members, using software for designing reflective artifacts about their design processes, developed a regular practice of articulating and sharing how they learn and develop creative ideas. In Chapter 8 Yasmin Kafai, Shiv Desai, Kylie Peppler, Grace Chiu, and Jesse Moya describe how Clubhouse mentors participate not just as more knowledgeable peers, but also as facilitators, advisors, observers, and, most importantly, as learners in this process. To provide a more global perspective, Elisabeth Sylvan examines in Chapter 9 how members share work and influence each other's creative processes within the online community called the Clubhouse Village, deepening our understanding of how creative ideas are spread in an online environment where learning happens socially.

We wrap up with findings from three different evaluation efforts in the fourth part, "Showcases of Clubhouse Successes." The Clubhouse organization commissions its own periodic evaluations that capture participation, motivation, and learning of Clubhouse members on a larger scale. In Chapter 10 Gail Breslow, the director of the Computer Clubhouse Network, pulls together key findings from several reports that document participation patterns in Clubhouse visits, the technology experiences of Clubhouse members, and youths' learning benefits over several years. Chapter 11, by Brenda Abanavas and Robbin Chapman, is based on a simple observation that girls came in much lower numbers than boys to visit the Clubhouse. This finding, of course, mirrors the well-documented absence of women and minorities in technology industries. This chapter describes and analyzes the efforts to engage girls in challenging projects with the support of others in order to improve their attitudes toward computers and view computers as relevant to their future. Chapter 12, by Yasmin Kafai, Kylie Peppler, Grace Chiu, John Maloney, Natalie Rusk, and Mitchel Resnick, turns our attention to one particular aspect of technology fluency—namely, programming—that was expected to be present from the beginning but turned out to be mostly absent in Clubhouse activities. They examine various normative, political, and technical aspects that contributed to change in one Computer Clubhouse, among them the introduction of a new programming environment oriented toward media production, the increased amount of mentor support, and a university-community partnership. They conclude with reflections on the Computer Clubhouse learning model and further developments.

With over 100 Clubhouses worldwide, the Computer Clubhouse Network has touched the lives of more than 50,000 young people and has been recognized through awards for its innovative and creative learning model. The Computer Clubhouse Network continues to make a difference in the lives of its members and to serve as a model for developing powerful learning opportunities for young people. Community organizations and individuals across the world have been interested in creating after-school learning environments based on the Clubhouse learning model where young people can enjoy the opportunity to express them-

selves as designers and leaders, have a voice in their communities, and develop as lifelong learners. This book is a first effort to bring together a collection of writings that document, describe, and analyze the creative work, critical engagement, and social support that characterize the Clubhouse model. Our intent is to share this unique model of learning, which will hopefully inspire others to rethink after-school and in-school learning spaces. Creative uses of and with technology should not be a privilege, but a right for all youth.

Edited by YASMIN B. KAFAI, KYLIE A. PEPPLER, AND ROBBIN N. CHAPMAN

THE COMPUTER CLUBHOUSE

CONSTRUCTIONISM AND CREATIVITY IN YOUTH COMMUNITIES

Forewords by BARTON J. HIRSCH AND ROSALIND HUDNELL

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PART III: COLLABORATIONS IN THE CLUBHOUSE COMMUNITY

PART IV: SHOWCASES OF COMPUTER CLUBHOUSE SUCCESSES

This book is about the Computer Clubhouse—the idea and the place—that inspires youth to think about themselves as competent, creative, and critical learners. So much of the social life of young people has moved online and participation in the digital public has become an essential part of youth identities. The Computer Clubhouse makes an important contribution not just in local urban communities but also as a model for after-school learning environments globally. This model has been uniquely successful scaling up, with over 100 clubhouses thriving worldwide. Showcasing research by scholars and evaluators that have documented and analyzed the international Computer Clubhouse Network, this volume considers the implications of their findings in the context of what it means to prepare youth to meet the goals of the 21st century.

Book Features:

- A successful, scalable model for providing at-risk youth a rich array of media design and computing experiences.
- Diverse examples of media created in the Clubhouse, ranging from digital stories, video games, interface designs, and digital art projects.
- Color photos of life in the Clubhouse, including youth projects.
- Interviews with stakeholders in the Clubhouse Network, from the director to coordinators at various international clubhouses.

"It is difficult to conceive of an after-school setting that would have a greater emphasis on positive youth development.... Beyond learning computer programming, young people at the Clubhouses learn marketable skills in product design, project management, teamwork, marketing, and communication.... Read [these chapters], appreciate what has already been accomplished, and consider the exciting possibilities for the future."
—From the Foreword by **Barton J. Hirsch**, Northwestern University, author of *A Place to Call Home: After-School Programs for Urban Youth*

"As you will read in this book, the impact of the Computer Clubhouse on underserved youth around the world has been far-reaching, long-lasting, and life-changing."
—From the Foreword by **Rosalind Hudnell**, Intel Corporation

"Essential reading for anyone concerned with the development and education of contemporary youth.... Its lessons go far beyond the Clubhouse."
—**Michael Cole**, author of *The Fifth Dimension: An After-School Program Built on Diversity*

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Cover photo by Jae Chung at the Flagship Clubhouse at the Museum of Science, Boston, which is also the global headquarters for the Intel Computer Clubhouse Network.