Evidence of Impact

Intel Computer Clubhouse Network

Evaluation of Clubhouse Development and Student Impact

Based at the Museum of Science, Boston, the Intel Computer Clubhouse Network includes 100 Computer Clubhouses in the United States and in more than 20 countries around the globe. The network provides access to professional mentoring in technology learning environments located in areas where such access would otherwise be quite limited.

In the Clubhouses, students aged 10 through 18 work with cutting-edge computer technologies to design projects that reflect their interests. Each week, an average of 150 students explore a variety of design tools and create advanced products, such as computer-generated art, music, video, Web pages, animations, games, and even robots created from computer-enhanced building sets, such as Legos*.

While students use technology tools to develop original and meaningful works, they receive guidance from community mentors. The program's unique mentorship and product-based approach helps students become technologically fluent, work collaboratively, solve problems, develop and execute complex projects, and develop self-esteem.

Evaluations of the Network

Starting with the first year of the program, EDC/CCT conducted a 3-year evaluation of the Computer Clubhouse Network. The evaluation included large-scale qualitative studies of factors contributing to the success of developing Clubhouses. The evaluation also looked at how well the Clubhouses support the program goals for student growth and achievement. Through extended observations of sites, interviews with participants and staff, and reviews of student projects, EDC/CCT uncovered insights into best practices for these informal technology settings. As the network grows, the best practices are being implemented to improve outcomes at the Clubhouses.

In the last two years, SRI International developed an online Youth Impact Survey, and administers the survey three times per year to students attending a Clubhouse. This survey provides recent and wide-ranging information about Clubhouse visiting patterns, member backgrounds, and members' attitudes about their own competence in terms of technology, academics, and social interactions with peers and adults. Over time, SRI intends to use this information to demonstrate changes in student attitudes and Clubhouse use that can be correlated with membership in a Clubhouse.

Successful Clubhouse Development

From the beginning of the program, in the first year of research, the many different Clubhouses represented significant variation in success in terms of the following four key principles:

- Learning through design
- Building on youth interests
- Cultivating emergent community
- Creating an environment of respect and trust

Together, these four principles comprise the program's vision of the tone, culture, and values shared across the network even though the principles are not always equally reflected in the outcomes of every Clubhouse.

This initial research showed that differences among sites corresponded to local logistical and resource challenges rather than to the commitment to or understanding of the program's vision. For example, some of the most important factors in Clubhouse outcomes were the prior experience and expertise of the Clubhouse coordinator; the local resources available, particularly the supply of qualified volunteer mentors; and the level of support from the community organization hosting the Clubhouse.

In sites with adequate levels of mentor staffing and coordinators experienced in facilitating technology learning among children, researchers observed students engaged and motivated in design projects. In these sites, students interacted with mentors frequently to discuss their projects and also worked collaboratively with minimal disruption or distractions. In contrast, sites with inadequate levels of staffing and a lack of expertise or guidance from the site coordinator tended to experience higher levels of student distraction and engagement in undirected activities.

Researchers at EDC/CCT identified the following progression path that provides a framework for Clubhouses to work within while developing a mature and successful program:

Program Feature	Early Stage	Middle Stage	Mature Stage
Design-based activity	Sporadic, serendipitous, and not supported	Encouraged intermittently and supported unevenly	Central, habitual Clubhouse activity supported consistently
Coordinator and mentor expertise	Limited technical expertise and youth development expertise	Varying technical and youth development expertise	Shared vision that includes a clearly understood approach to supporting design activities with youth
Institutional support	Clubhouse and host organization missions superficially compatible	Clubhouse and host organization missions appear compatible but have some logistical tensions	Clubhouse and host organization missions complementary and reinforcing
Local resources	Few connections to community resources that can be leveraged	Available community resources, such as mentors, leveraged by coordinator	Resources contributed and leveraged by coordinator, mentors, and members
Technical support	Local technical support intermittent and difficult to come by	Local technical support available but possibly not prioritized by host organization	Local technical support readily available

Engagement of the Students in Program Goals

The information gathered by EDC/CCT about Clubhouse development in the first year of research has aided and supported the program's expansion. As Clubhouses continue to progress toward maturity, the EDC/CCT researchers focused their second year of research on how well the program as a whole engages students in working toward the program goals.

Through in-depth case studies, interviews, and reviews of student work, researchers focused on two questions:

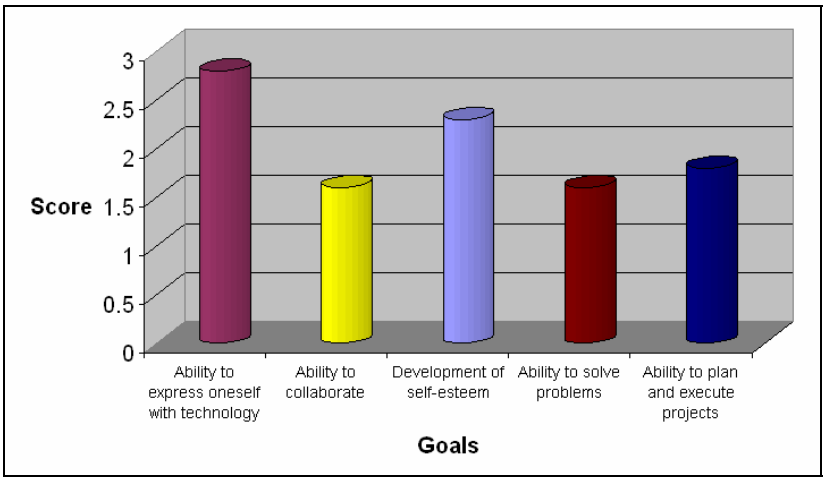
- What factors influence how well students progress toward program goals?
- What evidence shows that students are progressing toward the goals?

The research team developed several rubrics for students to measure student progress toward each of the following program goals:

- Ability to express oneself with technology
- Ability to collaborate
- Development of self-esteem
- Ability to solve problems
- Ability to plan and execute complex projects

Goals	Characteristics of Progress toward Goals
Ability to express oneself with technology	*Content:* How personally invested the member is in the style of the piece *Form:* What drove the choice of the project type (form, genre) *Structure:* How open-ended the tools used were *Identification:* Whether the member identifies self as creator
Ability to collaborate	*Composition of project:* Who made the parts of the whole *Degree of collaboration:* How the whole was put together *Connection to larger community:* How the project is shared, and how it contributes to others in or out of the Clubhouse *Roles:* How much teaching or learning is represented in the project
Development of self-esteem	*Confidence in skills:* How the student views his or her ability to use technology *Pride in product:* How the student views what he or she has made and its purpose *Investment in process:* How the student understands and values the process of creating the product
Ability to solve problems	*Identification:* The challenges that the student identifies in his or her work *Response:* How the student describes the process of solving the problems encountered *Tools:* How the student matches the tools available to the problem at hand *Outcome:* How technically complex the final product or solution is
Ability to plan and execute complex projects	*Goal setting:* What goals the student associates with his or her activity *Planning and persistence:* How extensive the student's attempts are to achieve his or her goals *Resourcefulness:* How creative the student is in bringing together resources needed to pursue his or her goals

The analysis of student work enabled the research team to draw conclusions about how students were performing in relation to the program goals.



Analysis of student work

In year 2 of the Computer Clubhouse Network evaluation, researchers rated a sample of 22 student projects to help illustrate student engagement in pursuing the program goals. A scale of 1 through 3 was used to represent progress toward program goals, with 3 representing the highest amount of progress.

Researchers found that while all students benefited from the program, older students and students with prior technology experience and a specific area of interest were better able to pursue projects that were consistent with the program goals.

Researchers also found again that the Clubhouses studied reflected differing levels of development. The likelihood that any student would engage with the program goals and sustain an interest in pursuing relevant activities was substantially increased when the Clubhouse was characterized by the following:

- Clear and consistent focus on activities related to the goals
- Coordinator with expertise in design-based learning
- Pathways for development toward the goals appropriate for different ages
- Audiences with whom students can share their ideas
- Student leadership in Clubhouses and communities

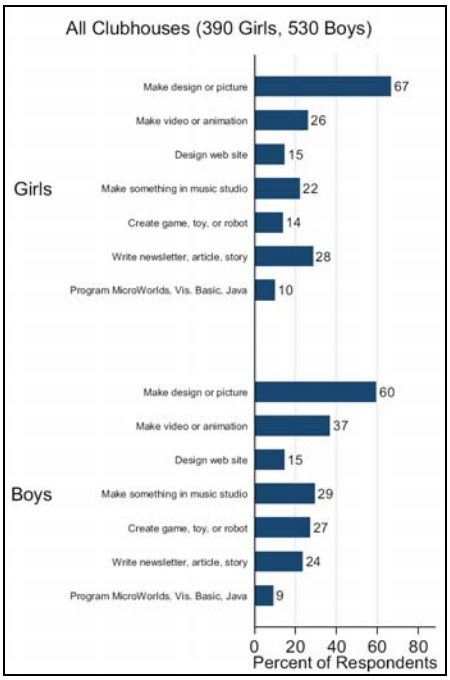
The Program Now: Student Use and Attitudes

Today, students who visit a Clubhouse are asked to take an online Youth Impact Survey administered by SRI International. This survey—administered in February, May, and November—measures usage patterns at the Clubhouses as well as several key attitudes expressed by the students about themselves.

According to the most recent analysis available, members visit their Clubhouses frequently. The vast majority of Clubhouse members visit the Clubhouses at least weekly, and about half visit the Clubhouses every day. Not only are the members visiting often, but they are staying for extended periods of time—83 percent of members spend at least an hour at each visit, and 34 percent spend at least three hours per visit. No strong gender differences are observed in these findings.

More than half (62 percent of girls, 60 percent of boys) report that they typically work for at least one hour on the computer during their visits. Of these members, 90 percent report trying at least one of seven types of activities that are encouraged at the Clubhouse. The most popular activity among both boys and girls is to make a design or picture, but a sizable percentage (13 percent of girls, 14 percent of boys) report trying even the least popular activity—programming.

When questioned about typical or recurring activities, the usage patterns remain similar to those found for trying a particular activity once. Of members, 86 percent report usually participating in at least one of the seven activities, and again, making a design or picture is the most popular activity.



Percent of members usually participating in a particular activity

From the analysis of the Youth Impact Survey results for May 2006, 86 percent of members reported usually participating in at least one of seven types of activities encouraged at the Clubhouses.

A higher percentage of girls than of boys usually make a design or picture, which is also the most popular activity overall.

A higher percentage of boys than girls usually do the following:

- Make a video or animation
- Make something in the music studio
- Create a game, toy, or robot

The survey also shows that most members have positive attitudes about their own enjoyment of, competence in, and confidence with technology, academics, and social interactions. More than half of the respondents scored above the midway point on questions such as, *Thinking about yourself, how much do you like to work on projects with other kids, feel like you do a better job when you work with other kids, or get along with the other kids in your group?*

Although a cause-and-effect relationship between the attitude ratings and Clubhouse membership is not established in this survey, some correlations are seen between Clubhouse usage and attitudes. For example, responses to the attitude scales appear more related to the length of the visits than to the frequency of the visits.

Further Reading

Gallagher, L. (2005). *Assessing youth impact of the Computer Clubhouse Network: 2005 year-end report.* Menlo Park, CA: SRI International.

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