

Improving Computer Literacy Through Training Programs

By: Angelica Weiner

... they learn how to express themselves through these tools. They learn not only the technical details, but the heuristics of being a good designer: how to conceptualize a project, how to make use of the materials available, how to persist and find alternatives when things go wrong, and how to view a project through the eyes of others. In short, they learn how to manage a complex project from start to finish...

A. Background

Zambia has made a lot of progress in introducing technology to enhance classroom learning. Despite increased accessibility and expansion, fluency in computer skills has not been achieved by a majority of students and individuals. Advanced computer applications are not common. The report sent explains the importance of training school teachers in basic computer skills as a precursor to introducing computers, Internet, and educational materials to a classroom. The current situation shows there is little usage of computers in Zambia schools, and only a little more usage for adult and higher-level education where networking remains very low. The study states that the rapid deployment of computers and Internet to schools with trained teachers is a must. The ultimate goal is to not only distribute computers, but promote useful computer literacy. This includes well trained teachers and sophisticated computer use by pupils for curricular purposes. In order to promote thorough understanding of computer topics, new ways should be adopted to teach them.

B. Uses

A proposed solution for increasing computer literacy in young people is by adapting computer training programs. Mitchel Resnick of the Massachusetts Institute of Technology's Media Lab explains the value of using creative media to teach about computers and programming in his initiative called Computer Clubhouses. His system of after-school centers for young people (ages 10-18) has successfully taught youth how to express themselves creatively with new technologies. Clubhouse members work on projects based on their own interests, with support from adult mentors. By creating their own animations, interactive stories, music videos, and robotic constructions, Clubhouse members become more capable learners and fluent in the workings of advanced computer applications. A full and thorough knowledge of computers is necessary for complicated tasks, and through student-led projects that goal can be achieved. Thus the proposal for a policy change is to alter computer training curricula so they more effectively teach computer usage, an invaluable educational tool. By using computer technology as a creative medium for expression and teaching about computers in such a way, there will

be greater output for the time and money invested. Computers, software, and networking do not, by themselves, lead to the development of technological fluency.

In recent years, a growing number of researchers and educators have argued that design projects provide rich opportunities for learning (e.g., Harel, 1991; Papert, 1993; Lehrer, 1993; Soloway, Guzdial, & Hay, 1994). There are many reasons for this interest in design-based learning:

- Design activities engage youth as *active participants*, giving them a greater sense of control (and responsibility) over the learning process, in contrast to traditional school activities in which teachers aim to "transmit" new information to the students.
- Design activities encourage *creative problem-solving*, avoiding the right/wrong dichotomy prevalent in most school math and science activities, suggesting instead that multiple strategies and solutions are possible.
- Design activities can facilitate *personal connections* to knowledge, since designers often develop a special sense of ownership (and caring) for the products (and ideas) that they design.
- Design activities are often *interdisciplinary*, bringing together concepts from the arts, math, and sciences.
- Design activities promote a *sense of audience*, encouraging youth to consider how other people will use and react to the products they create.
- Design activities provide a context for *reflection and discussion*, enabling youth to gain a deeper understanding of the ideas underlying hands-on activities.

(Resneck)

C. Implementation Plan

The implementation is not overly complicated or costly but requires an investment of time and effort. To support these activities, the Clubhouse provides a variety of design tools, from introductory paint programs (such as KidPix) to high-end animation tools (such as Macromedia Director). Other software tools include: digital music recording, editing, and mixing tools; desktop publishing tools; programming tools (such as Microworlds Logo); virtual-reality design tools for developing three-dimensional models

on the computer screen; and construction kits for creating and controlling robotic machines (such as LEGO Control Lab). Clubhouse provides professional software packages that are commercially available, as well as prototype educational tools developed at MIT's Media Lab.

Clubhouse professional level software tools include:

Graphics/Design/Animation

Adobe Illustrator[®]
Adobe Acrobat[®]
Adobe After Effects[®]
Adobe InDesign[®]
Adobe Pagemaker (Plus)[®]
Adobe Photoshop[®]
Credo INT Lifeforms
Mindscape KID PIX Deluxe
Macromedia Director MX[®]
Macromedia Flash[®]
Macromedia Fireworks[®]
Macromedia Freehands[®]
Corel: Draw[™]
Corel: Painter[™]
Broderbund Printshop Deluxe
Scansoft SuperGoo[®]
Scansoft Kai's Power Tools[®]
Ulead Face Factory

3D Programs

Autodesk: 3D Studio Max & Plug-Ins[®]
Corel: Bryce[®] 4
Curious Labs Poser
Havas Home Architect

Writing

Microsoft: Creative Writer[®]
Office XP Pro

Web Design

Adobe GoLive[®]
Macromedia: Dreamweaver

Music and Sound

Cakewalk: Sonar XL
Mixman Technologies: Mixman Studio Pro

Robotics and Science Exploration

Sierra: Havas Incredible Machine

LEGO: Mindstorms Robotics Discovery Set

Programming

Microsoft: Visio 2000 Technical Edition®

Microworlds PRO

Visual Studio Pro

Video Editing

Adobe: Premiere®

Ulead Video solution

To implement this project requires a reworking of curriculum in schools where computer education is part of the school. Even at the university level this sort of creative learning would be productive even though a traditionally younger student-base has tested these Clubhouses in the states. A trained faculty is essential in leading a class or after school computer program first. Once the software is purchased and teachers are trained, implementation just requires a refocused direction in teaching. While Clubhouses are after school programs in the United States, they could replace a class in school instead and ideally. The high-tech classrooms involve software that is easily transportable, so the Clubhouse learning initiative can travel to different schools and classes with ease by the year.

D. Set-Backs

The Set-backs are the costs in purchasing new software and spending time training teachers. The risk is that teachers will not master the material enough to administer a class, which is essential according to the Mitchel Rezneck, Clubhouse founder. Another factor is that emphasis might be taken off of other material in schools to focus on computer training. As with any major change, it runs the risk of poor implementation and wasted money. If fully promoted however, the results of a two year study show that Clubhouse methods of teaching computers have been successful and will continue to be. The only variant on student success was how much exposure they had to computers prior to the program; more knowledgeable students were more successful in making advanced computer programs.

E. Fall-Back Options

The alternative would be to continue teaching computers as it is done now. In either scenario, the priority should be to spread the availability and use of computers. The point of the program is to immerse students in creative media software so that they learn not how to play computer games for example, but to create them. Only integrating some forms of creative software into a computer curriculum would be beneficial, but no longer part of the MediaLab's vision.