

Constructionist Learning and Teaching in a Computer Clubhouse Environment

Josie Hopkins and Anne McDougall

Department of Science and Mathematics Education
The University of Melbourne
Victoria 3010
Australia

jhopkins@schoolkit.com a.mcdougall@unimelb.edu.au

Keywords: constructionist learning and teaching.

Introduction

This paper describes the teaching approach used in an after-school Computer Clubhouse in Melbourne, Australia. The teaching is based on the idea of constructionist learning articulated by Seymour Papert, and emphasises the principle of just-in-time learning such as is often used by IT professionals. The paper draws on observations of the work of Clubhouse participants during 2002 and interviews with the Director of the Clubhouse.

The Computer Clubhouse

The Computer Clubhouse idea was initiated from the Media Lab at the Massachusetts Institute of Technology. Professor Mitch Resnick was committed to providing for students from disadvantaged backgrounds learning experiences that they might not have otherwise, giving them opportunities to use computers and Lego materials, to write their own programs, and to have a variety of related learning experiences. The Clubhouses in the U.S.A. have sponsorship from some major IT companies, and are able to provide for participants a rich range of computing and related equipment and resources. There are now Computer Clubhouses in the U.K., Europe, South America and India as well, and a world-wide network is developing. To become formally part of the network, Clubhouses must meet a set of criteria including size and hours of opening.

The Computer Clubhouse at the Fitzroy Learning Network, an after-school facility, is the first in Australia. It was opened in 1999, and with sponsorship from philanthropic groups and support from the Clubhouse Network in the U.S.A. it has expanded its activities and developed a stable staffing arrangement.

Constructionist Learning and Teaching

Papert (1991) summarises the idea of constructionism as follows:

It shares constructivism's connotation of learning as "building knowledge structures" irrespective of the circumstances of the 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.

(Papert 1991:1)

The teaching approach used in the Computer Clubhouse is deliberately based on Papert's constructionism (see also Harel and Papert 1991, Kafai and Resnick 1996). Students learn by doing, planning, making and constructing projects of interest to them. They are encouraged and supported to work as designers and creators. Robotics, multimedia development and website building activities are generally the most popular types of projects.

The Clubhouse is staffed by a Director and several volunteer mentors. The Director is a former school teacher who understands and values the approach to learning and teaching implied by Papert's work. The mentors are generally young, highly skilled people from the IT industry, and at first the Director works with them, modeling and discussing the ways in which they might support the students' learning in the Clubhouse. The approach used is not particularly different from activities the mentors are used to in their work in industry, where, as needed, they might ask a colleague with particular knowledge for help with a specific technique or for information about a new software application.

In the Clubhouse the mentors watch the students at work, occasionally asking questions about their projects. As needed by individuals or groups of students, they provide demonstrations or explanations of new skills or programming strategies; they then immediately hand control of the work back to the student or students. They facilitate and support the students' building activities, providing just-in-time learning, as would be the case among professionals. They do nothing that would take any initiative or ownership of the project away from the students they assist. The Director and the mentors all work with the students in this way.

Through sponsorship arrangements, the Clubhouse students have access to “industry strength” software applications. The mentors can demonstrate the capabilities of these products to give students ideas for activities they themselves might undertake, and to enable them to undertake projects that they might otherwise be unable to attempt. Usually there are one or two mentors per student group, and the mentors rotate among the groups from week to week so that students have access to a wide range of expertise and advice over the course of a project.

In contrast to most school environments, activities in the Clubhouse can appear relatively unstructured; however first impressions can be misleading. Clubhouse sessions are structured in the following way. As the students arrive they may chat together informally or go straight to the computers to play games, send e-mail, start school homework, or do whatever helps them to “unwind” from the school day. Participating in chat lines is very popular, especially with the girls. Incidentally these activities, particularly the games, can provide sources of ideas for later projects. Then all the participants - students, mentors and Director - gather around a table with drinks and snacks to begin the afternoon’s meeting. The meeting provides opportunities for students to report progress on individual or collaborative Clubhouse projects, to seek help if it is needed, and to brainstorm ideas for new projects.

Then students set to work on their projects. This might involve working singly or in groups at the computers; some students might set off with the digital camera to take photographs for later modification and incorporation into a project; others might search the Web for images or prepare drawings on paper for later scanning and use in a project, and so on. The teacher and mentors watch and support the students’ work, demonstrating new techniques as needed, acting as resource people and facilitators, but taking care always that the students initiate, develop and own the work and the artifacts they are making.

Publication and sharing of the students’ projects is encouraged, as recognition of the work, and as a source of ideas for other students. Students demonstrate their projects to others in the Clubhouse, and as well their work can be published on the Clubhouse website.

Discussion

Embedding IT into learning experiences has not previously been an area where trainee teachers can draw on extensive experience during their school years, unlike in Mathematics, say, where a potential Mathematics teacher will have perhaps twelve or thirteen years of subconscious critical observation at the receiving end of the pedagogy of other Mathematics teachers. In the case of IT teachers this is critical, as most have at best only their university lectures as an example of how IT skills and concepts may be taught.

The teaching approach being used in the Computer Clubhouse, derived from the powerful idea of constructionist learning and consistent with the practices

of IT professionals, provides a model of IT teaching that we believe has value for teachers and for teacher education in this area.

Acknowledgement

Research associated with the Computer Clubhouse at the Fitzroy Learning Network is supported by a grant from the Buckland Foundation. The authors acknowledge the assistance of Kerry Finlayson, Director of the Computer Clubhouse at the Fitzroy Learning Network, with the development of this paper.

References

- HAREL, I. and PAPERT, S. (eds) (1991): *Constructionism*. Norwood, New Jersey, Ablex Publishing Corporation.
- KAFAI, Y. and RESNICK, M. (eds) (1996): *Constructionism in Practice*. Mahwah, New Jersey, Lawrence Erlbaum Associates.
- PAPERT, S. (1991): Situating Constructionism. In *Constructionism*. HAREL, I. and PAPERT, S. (eds). Norwood, New Jersey, Ablex Publishing Corporation: 1–11.