Four Models for Educational Computing in Out-of School Programs

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Many After-school programs are getting access to computers and realizing that computer access is only the first step toward an effective program. Directors and teachers quickly realize that a computer educational program is the thoughtful mix of computers, software, youth, staff, and other resources. Not all after-school computer programs are alike. When designing a program it is useful to think about conceptual models of educational computing in out-of-school programs. For discussion purposes we have defined four different models of computer-education for out-of-school programs. There is considerable overlap among the models. The ideal program will have an interrelated mix of all the models.

Play-based Model

In the play-based model, computers are toys and the participants are encouraged to engage in self-directed play. The program succeeds or fails educationally and otherwise based on the software selection. Games (Roller Coaster Tycoon, SimTown, Zoombinis) and creativity (i.e. Orly's, Goo, Magic Artist) software are the most popular with the participants. Informational software (i.e. Encarta, World's Greatest Museums, NASA) and the Internet are frequently used for information exploration as recreation.

Play-based programs need a wide selection of software. Not all kids are interested in the same topic and once a game is mastered the player is frequently ready to move on - either to the next game or out the door. About 15-20 good titles is a start for a group of similar age. The wider the age range the more software you will need because computer software is frequently age specific.

The educational value of games varies from very bad to very good. Some of the most popular games (i.e. Doom, Quake) have violent content. However, there are many popular games (i.e. SimCity, JumpStart, Oregon Trail) with excellent educational content[1].

Program rules should encourage interaction among the participants with youth frequently "playing" together or sharing with each other. The role of the teacher is creating a good selection of software, encouraging the exploration of a variety of software, and encouraging positive social interaction. Discipline is seldom an issue because the participants are fully engaged in the experience.

Content-Focused Model

A content focused program builds on the content of one or more software titles and integrates them with related off-computer activities. Although the youth are encouraged to produce a product or present what they have learned, the product or presentation is not the primary focus. The primary purpose is to help the youth to put what they are learning with the software into a broader context. The most basic implementation of this model is just talking with the game players and asking leading questions for example: If the child was playing Sim City the teacher might ask, "Where does the electricity for our city come from? or in Roller Coaster Tycoon, a

question could be “tell me about your amusement park’s budget? These questions will lead to discussions about how a game’s vocabulary and concepts relate to the real world. The teacher can also plan activities, field trips or guest speakers related to the content. Contests like a virtual air rally with flight simulator can help encourage youth to get deeper into a software title. Youth demonstrating a software title can help teach others about the title and develop the presenter’s skills. Any activity where you get the kids to talk and think about what they are playing will multiply the educational value of the software. This model is still very much youth driven with teachers following and building on the interests of the youth.

Product Model

A product-based computer education program focuses on production of a computer-generated product. The objective is a product and the computer learning happens as the product is created or enhanced. This is typically a group activity. Ideally the projects should be student initiated. However, in practice, the projects are often teacher initiated and supported but should be student lead. Projects generally focus on graphics, music, video or design. Common graphic products are websites, newsletters, PowerPoint style presentations, greeting cards and t-shirts. Landscape or home design projects are other possible directions. Product-based activities are frequently used as communication, marketing, or funding support for the program. Computer product models are sometimes combined with entrepreneurial programs and the products are sold. The software and support available usually define the scope of the projects. Design and production software can range from relative low-cost and simple (i.e.StoryBook Weaver, PrintShop, SuperDuper Music Looper) requiring only basic skills to high-end professional software (i.e.Photoshop, AutoCad, Shockwave Studio). There are also many titles that are easy to get started both in cost and skill but can produce professional level products (i.e Powerpoint, iMovie, WordPerfect)

Instructional Model

Instruction based programs are generally teacher led with the children following along, all on the same program, at the same pace. Examples are the word processing or typing classes offered during the school day. In general, this model is not the best for an after-school setting. However, short instructional sessions can be very useful in introducing basic computer skills and supporting other models. Instruction is sometimes necessary to introduce a new game in the play-based or content-focused models. Children engaged in product based activities sometimes need instruction to develop the skills needed to use the tools available. Instruction should happen in short spurts with a lot of time to practice and explore the new material. Consider having youth do as much teaching as possible.

Piaget’s oft quoted comment “Children have real understanding only of that which they invent themselves, and each time that we try to teach them something too quickly,
we keep them from reinventing it themselves."[2] This quote is especially relevant for learning with and about computers. Computers with quality software can encourage students to invent businesses, cities, artwork, and a thousand other inventions at a concrete and conceptual level like no other toy.

In summary, evaluate the resources you have- computers, staff knowledge, software, funds, interest of the youth, interest of the staff, and outside resources. And adapt the computer education models that will work for your program.

[1] Children's Software Revue www.childrenssoftware.com
[2] http://www.top-psychology.com/9025-Jean%20Piaget/quotations.htm

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