Some Free and Open Source Educational Programming Languages

Alice
www.alice.org
Alice is a programming environment designed for middle school students, specifically targeted to middle school girls. It supports the creation of interactive 3D stories and games within a graphical drag-and-drop coding environment.

A++
www.aplusplus.net
This is a programming language created to help students quickly and efficiently understand the essentials of programming. It promotes the acquisition of programming concepts by helping students acquire pattern-recognition skills that can be applied in most standard programming languages.

Greenfoot
www.greenfoot.org
Greenfoot is a graphical IDE (integrated development environment) that permits programmers to design 2D games and virtual worlds while learning the fundamental concepts of object-oriented programming utilizing Java. Greenfoot was developed at the University of Kent (U.K.) and is supported by a number of sample projects and online tutorials. It is appropriate for ages 13 and older.

Karel, Karel++, Karel J. Robot
http://csis.pace.edu/~bergin/karel.html
The Karel languages are aimed at introducing beginners to the foundations of object-oriented programming. The most recent version, Karel J. Robot, applies a syntax very similar to Java. (Karel is named after Karel Capek, who coined the word "robot.")

Mozart
www.mozart-oz.org
The Mozart Programming System is a multiplatform implementation of the Oz programming language developed by the Mozart Consortium. Because it runs applications in a virtual machine, applications can be developed once and run on many different platforms. It is appropriate for ages 13 and older.

RoboMind
www.robomind.net
This is a simple programming environment that allows beginners to program a virtual robot. In addition to foundational programming concepts, it introduces students to robotics and artificial intelligence. The ROBO programming language applies a syntax that is very similar to Java.

Scratch
http://scratch.mit.edu
Scratch is designed to help young people (ages 8 and older) design games, stories, animations, and art using a graphical programming interface. As they create Scratch projects, kids develop important mathematical and computational concepts, while also acquiring an understanding of the process of design. Developed at the MIT Media Lab, Scratch is included on every One Laptop per Child (OLPC) machine.

Squeak/Etoys
www.squeak.org
Squeak is an educational programming language for teaching foundational programming concepts, as well as mathematics and physics concepts and multimedia skills. It was developed by Alan Kay and Dan Ingalls. The Etoys environment, which implements Squeak, is included on each OLPC machine. It is appropriate for ages 6 and older.

StarLogo TNG
http://education.mit.edu/starlogo-tng
StarLogo TNG (The Next Generation) can be used by students to model the behavior of multiagent, decentralized systems. It provides a 3D world using OpenGL graphics and a block-based graphical language to provide a low entry threshold. It is written in C and Java. It is appropriate for ages 10 and older.

For a more comprehensive overview of educational programming languages, see Kelleher, C. and Pausch, R., "Lowering the Barriers to Programming: A Survey of Programming Environments and Languages for Novice Programmers." *ACM Computing Surveys* 37.2 (2005).

The Library as a Media Lab

Education theorists are currently producing a great amount of research on the role of informal learning spaces (community technology centers, after-school enrichment programs, online communities) in promoting technology fluency among youth. Unfortunately, little of this research has focused upon the role of the public library, which—as part of an existing distributed network of institutions whose traditional role has been the promotion of literacy and learning outside the classroom—represents potentially the most resource-laden and accessible of all informal learning spaces available to today's youth and teen populations.

I believe that the reason public libraries are rarely considered viable spaces for promoting 21st-century literacy skills is that their youth and teen