

Exploring Educational Opportunities with Open Source

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Funding for technology in K-12 public schools is limited. The cost to install and maintain infrastructure and hardware alone is enough to diminish resources. The cost of licensing and upgrading software adds to the burden of funding the education for a generation of 21st century students. In the field of education, where funding is often inadequate, options for improving student achievement can be increased through the use of Open Source software. Open Source programs are developed in a collaborative manner and are available for no cost. In reality, nothing of value is free, however the concept of the Open Source does provide a new way of doing business, and deserves a closer look. Open Source provides significant cost savings for implementation of technology skills with core curriculum fundamentals within a school environment. These elements contribute to an increase in student achievement at all levels.

Understanding what Open Source means is the first step to determining where it fits in the education process. To begin to explore the concept, consider the differences between a bookstore and a public library. Anybody can access books at either source. At a store, a book must be purchased, and then it becomes the property of the individual. This purchase is similar to purchasing a license to use a software program. At a library, a book may be checked out for use, free of charge, as long as the person who checks out the book enters into an agreement with the library to follow certain guidelines. Open Source applications are also available, free of charge, as long as the user agrees to follow specified guidelines.

Open Sources takes the “lending library” concept a step further. Once a program has been “checked out,” it can be modified to meet the specific needs of the user. When a user has modified the code for the program, this code is then made available for the benefit of other users.

Additionally, as users work with the program, support documentation is made available for other users via the Internet.

The Open Source Initiative (OSI) is an organization formed in 1998 to provide standards for Open Source development, oversee the review and approval of Open Source licensing, and support the growth of the Open Source concept as it expands around the world. The OSI provides this definition of Open Source:

Open source is a development method for software that harnesses the power of distributed peer review and transparency of process. The promise of open source is better quality, higher reliability, more flexibility, lower cost, and an end to predatory vendor lock-in.

In other words, Open Source allows access to the source code of a program, allowing developers other than those who originated it, to use and modify the code for specific purposes. Linux, an operating system for personal computers, is one example of an Open Source application. The Apache Web Server, OpenOffice, and the Firefox web browser are also products from the Open Source movement. Firefox is an excellent example of an Open Source application that is stable and secure. Many users of Firefox are likely unaware of how the program was developed and that it is an Open Source application.

The implementation of Open Source into the education environment is a viable option, simply from the standpoint of licensing fees. Every computer in every school requires software to be functional. In the traditional process of using proprietary software, licensing fees can be a significant budget item each year; transitioning to Open Source programs can allow funding to be allocated for other school needs, or prevent schools from making budget cuts in critical areas.

How Open Source can fit in the overall technology plan of an organization is an important consideration. Hardware and operating system requirements must be analyzed, as well as support for the application once it is in place. California's Saugus Union School District undertook the challenge in 2004, and successfully migrated the district's network operating system to a Linux-based system that summer. Included in the migration were the district's web and email servers, and file and print utilities for both Macintosh and Windows. After the implementation, every teacher in Saugus Union was provided with a CD containing Open Source programs, ranging from office applications to podcasting, for use with students.

Since the implementation, management and tech support issues have decreased, freeing up time for IT staff to work on other projects. The district has saved \$54,000 in annual licensing costs, and estimate savings from \$50-\$200 per desktop workstation. The district states on the home page of their web site that they are "one of the most aggressive and successful open technologies adopters in the United States today." The site provides links to information for others interested in learning more about open technologies and how to proceed with conversion plans.

From reading and writing to podcasting and other digital skills, Open Source opens the door for students to step into the world outside their school. Nationwide, attention is being given to the need to increase the proficiency of students in the areas of technology, science and foreign language. This is in addition to concerns about the basic skills of reading, writing and math. Integration of Open Source technology not only assures immediate access to relevant programs, but also sets an unparalleled example of innovation and global collaboration. Recent announcements related to Open Source technologies, within and outside of education include:

- January 10, 2008: Virgin Mobile switches to Open Source database for SMS messaging service.
- January 23, 2008: The state of Florida announced it would adopt FreeReading.net in lieu of traditional textbooks to help kindergarten through third-grade students learn to read.
- March 5, 2008: The Navy announced it will adapt open technologies to increase capabilities and control technology costs.

Students at Brandon Elementary School, located in Georgia, benefited from the work of two parent volunteers who introduced Linux to replace Windows workstations that were inoperable due to aging hardware and lack of funding for operating system upgrades. Donations and PTA funding enable the IT savvy parents to provide computers for curriculum rich learning experiences. Standardized test scores are on the rise and students are learning from each other. The Atlanta School District is piloting a program at other elementary and middle schools, based on the success of the Open Source solution. Parent volunteer Daniel Howard stated, “There's a connection between education and open source. It's collaborative learning. The kids teach each other. A handful of the kids are the early adopter types -- they find stuff and show the other kids how to do it. That is reflective of the whole open source philosophy of people producing and sharing.”

In addition to programs that are beneficial to students, there are applications available for curriculum management that allow teachers to collaborate with other educators, share lesson plans and interact with students. Opening up an educator's horizon to include the global community creates opportunities for collaboration that result in engaging opportunities for students. A popular Open Source offering in this area is Moodle. Greg Veal, Assistant

Superintendent of Technology for Lewisville Independent School District in Texas, is utilizing Moodle to build a virtual environment within the school community. Veal states, “We’ve got about 1,000 teachers already participating in this process. We want our teachers to have a simple interface to run their classes, so to speak, through this medium. This gives them a number of types of interactive situations including forums, calendars, assignments, quizzes and tests. We see our teachers, kids and parents getting more and more excited about this type of learning environment.”

Moodle’s web site indicates a user base of more than 330,000 people, located in 196 countries. Forums such as this one, that provide educators unprecedented access to their peers around the world, establish online learning communities that benefit students and their teachers. As course management programs continue to develop, the availability of online options for learning will increase, allowing students to attend school where the appropriate individual content is available.

Open Source applications provide many options for school districts working to make the most of every dollar. The ability to lower cost must be weighed against the ability to support users. Thorough investigation is necessary to determine the impact that a shift to Open Source would have on the users of the existing system. New technology in any field should work for the user, rather than cause the user additional work. IT professionals, whether on staff, or working as consultants, must be involved in the research, planning and implementation of any major move away from traditional methods for instruction. Most importantly, a plan should be in place that specifies how support will be provided for Open Source programs.

Opponents to the concepts of the Open Source movement are quick to point out that there is not a support line to call when a problem occurs. Although the standard help line and

documentation provided by proprietary software developers do not exist in the same form, the Open Source community as a whole provides an unprecedented amount of support via blogs, white papers and other documentation. The key is to have people available with the ability to interpret code and programming guidelines.

Another concern about Open Source is the reliability – will there be “bugs” in the application we implement, and if so, how will they be resolved? This is a common question that indicates a surface level understanding of how non-proprietary programs are developed. Given the nature of applications that make code available for all to install and use, programmers have the opportunity to collaborate with others whose knowledge may exceed their own. This creates an end product that has been tested and developed beyond what might have been the case with a proprietary application. Given the fact that there are no secrets with Open Source, the very core of the applications are subject to testing and critique at a deeper level.

As reported by k12opentech.org, “There is high confidence that open source software will have a viable future because so many people are independently vested in it. It is stable because so many skilled developers are working on it and testing it in many different environments. Open source operating system users report that their systems are more reliable, offer greater performance, are easier to manage, and provide better support.”

Public school districts do have a source for support and collaboration that is unique: other school districts. There is a level of kinship among those working in the field of education, whether as teachers, administrators, or “techie,” that provides support in all aspects of working in a field that is continuously limited in resources. Many schools and districts have published case studies about Open Source implementation online. Additionally, IT professionals within the

field of education have the ability to customize Open Source applications, due to the very nature of the source code being open.

It is the responsibility of today's educators to prepare students for tomorrow's world. The profile of a 21st century learner paints a picture of a kid who has a web site and/or a blog, creates and shares music on their computer, and can research a topic quicker than a classroom teacher can write the homework assignment on the board. Today's students are masters at online collaboration, and should not expect any less of those tasked with providing their education. Today's educators are faced with tightened budgets, increasing costs for providing access to technology and competition from online and alternative schools. Open Source software provides one option for educators to step up to the plate and hit a home run. The resulting trip to the World Series will indeed produce world champions.

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