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Seeking an educational commons: The promise of open source development models

by Gary Hepburn

Abstract

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Schools are hindered by cost and flexibility problems as they try to obtain resources such as software and textbooks. Open source development processes are producing products that can address many of these problems and, as importantly, provide a better alignment with core educational values. Indeed, open source products potentially encourage the development of an educational commons.

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Introduction

Public schools and other educational institutions need to become more familiar with some of the opportunities that are emerging as a result of open source projects. Leveraging the potential of the Internet as a collaborative medium, open source development projects are producing software and other resources that have the potential to meet many needs of schools. As educators become aware of open source resources, they will immediately recognize the advantages of low–cost alternatives to many commercial products that schools currently use and find expensive. They will also notice that open source resources lack some of the usage restrictions that characterize commercial resources. The low cost and flexibility of open source products makes them very attractive, but no less important is the way in which these resources align with some core educational values. In this article, I illustrate this alignment by exploring the promise that open source resources hold in supporting the ideal of an educational commons.

The educational commons

Most of us have at least a passing familiarity with the concept of a commons. According David Bollier (2003), the term refers to "a wide array of creations of nature and society that we inherit freely, share and hold in trust for future generations." Well–known examples of commons that exist or have existed include grazing land, the Internet, fresh water supplies, and roadways. Lawrence Lessig (2001) pushes the concept of a commons further in his book, *The Future of Ideas,* as he describes the role of an *innovative commons* in society:

> "They create the opportunity for individuals to draw upon resources without connections, permission, or access granted by others. They are environments that commit themselves to being open. Individuals and corporations draw upon the value created by this openness. They transform that value into other value, which they then consume privately." [1]

The fact that society has always used the value of that which we hold in common to build greater value allows us to see an important reason why maintaining common resources is good for all. Even private enterprises benefit from that fact that we hold some resources in common. To appreciate this point, all we need to do is consider the value of roadways to individual and commercial activities. Recognizing the importance of common resources is not anti–private or anti–commercial. Providing some common resources and seeking a reasonable balance between that which is privately owned and that which is held in common benefits society.

Public institutions, such as schools, can be thought of as a type of cultural commons (Bollier, 2001, 2002; Reid, 2003). Societies around the world recognize the importance of providing education for all and have made substantial investments to do so. Thought of as a commons, schools ideally ought to be able to provide the resources needed to support optimal learning experiences for students. Our societal investment in education is an attempt to enable this, but we often encounter limitations as providing education is complicated and costly. In reality, schools have trouble living up to the ideal of an educational commons. Clearly, schools do not meet some of the criteria Lessig described above for an innovative commons to exist. There are many cases in which schools are not able "to draw upon resources without connections, permission, or access granted by others" [2].

Assuming we want to establish an educational commons that supports innovation, we need to reconsider some of the conditions under which education is conducted. Exploring the concept of an educational commons can bring about a fresh perspective, revealing current blind spots as well as future strategies that may lead us closer to an educational commons. Recent technological developments and, in particular, the Internet have provided some ways in which we can draw upon common resources to aid us in our educational activities. Before I explore these developments further, I will briefly discuss the principle threat to our ability to realize an educational commons.

Market enclosure

Many examples can be drawn from current situations and from history of resources that were once held in common being taken over by commercial or private interests. These examples range from the selling of commonly held land in England beginning in the 1400s (Bollier, 2001) to the increased commercialization of the Internet in more recent times (Lessig, 2001). Increasingly, that which is held in common is being sold or given away. It is no different in schools. Schools are being seen as an under–exploited resource by corporations, and commercial intrusions into educational spaces are becoming more common. These intrusions are what Bollier (2001, 2002, 2003) calls market enclosure. The concerns the market enclosure of education raise are not going unnoticed *(e.g.,* Apple, 1993; Kunkel, *et al.,* 2004) but many schools find themselves in a difficult dilemma.

Because most schools tend to be under–funded, offers from companies to provide resources or funds in exchange for allowing them to advertise in schools are tempting. Many educators are uncomfortable with the idea of allowing corporations into schools, but they also want more educational resources than schools can currently afford. A well–known example of corporate intrusion has been orchestrated by a company called Channel One. Participating schools are provided with satellite dishes, VCRs, and televisions for each classroom provided they agree to watch a daily, 12–minute, youth–oriented news program. Two minutes of the program are devoted to advertisements. In 1999, Channel One was delivering its services to approximately 12,000 schools which provided its advertisers with access to nearly eight million students in grades 6 through 12 (Hayes, 1999). Schools gain donated equipment that can be used for instruction at times when the newscasts are not being shown and access to the news program, the value of which is a subject of debate. Channel One is just one example of market enclosure impacting schools.

Closely related to the problem of schools feeling pressure to allow a corporate presence is the cost of providing educational resources. Textbooks, computers, software, and encyclopedias are examples of resources for which schools normally pay. After schools have paid operating expenses such as building maintenance and teacher salaries, they often find that there is little money left to purchase these resources. Schools find themselves in the position of having to consider either doing without or taking advantage of alternative sources of financial support, such as corporate funding. Whatever the approach taken to the problem, schools can rarely gain access to the quantity and variety of resources they would like to have available.

Even when a school does manage to obtain some funding for resources, another aspect of market enclosure impacts their ability to use the resources in the ways that will most help students. Resources like software and textbooks are normally protected by copyright. Copyright laws protect the rights of the creators of a work, allowing them to control its use and

receive compensation. Copyright law also seeks to balance the rights of the creator with society's right to use the work to create further innovation. Recent changes in copyright laws, however, have increasingly favored the rights of the creator of the work (Lessig, 2001) and this has consequences for schools. After schools purchase the quantity of a commercially produced resource they can afford, they are normally faced with usage restrictions. In the case of educational software, a license is typically required for each computer on which the software is installed. Schools cannot put the software on other computers nor can they provide copies to teachers or students to be used inside or outside the school. The fact that software and other resources are copyright controlled means that a school's use of those resources is largely subject to the conditions set by the corporation or individual that owns them.

The impact of the commercial interests on schools is significant and important. Corporations influence the ability of schools to obtain resources and how they can use them. For these reasons there are some substantial limits on the degree to which schools can claim to be an educational commons. Schools appear to be a commons when we consider that, in most parts of the world, all students can freely attend school and expect to be educated there. A closer examination, however, shows that schools have to negotiate the ways in which they educate students with corporations, and it is the corporations who appear to have the upper hand.

The concept of schools as a commons has appeal, but thinking this way forces us to recognize the threat of market enclosures. We tend to notice recent corporate intrusions into schools because, as Hardin (1968) says, "Infringements made in the distant past are accepted because no contemporary complains of a loss. It is the newly proposed infringements that we vigorously oppose; cries of *rights* and *freedom* fill the air" [3]. There are objections to the emerging enclosures of education, such as that of Channel One, but we must also recognize other types enclosures that we tend to accept without question, such as the purchase of textbooks and software. Because the purchase of copyrighted, commercial products tends to be an accepted educational practice, we generally see it as normal. Given the problems and limitations education encounters that are related to these normal purchases, it may be worth re–examining our practices and options. Recent progress involving the Internet and some of the development models it enables provide a new possibility with which to juxtapose current practices.

Open source software for education

The Internet has become a major resource for education and is used extensively for various purposes, most of which currently appear to relate to research and homework help (Lenhart, *et al.,* 2001). While this role is valuable, there is another way in which the Internet may be able to indirectly bring benefits to schools. Largely due to its potential as a collaborative medium, the Internet has been able to facilitate a great deal of software development. Of particular note is rapid emergence of open source software.

The open source approach is quite different from that of companies that produce commercial software. These companies normally sell consumers binary versions of their software that can be read by computers but not by people who have programming skills. The companies also use licenses to restrict users from distributing or modifying the software. These measures allow the company to maintain control of the software product and to ensure that anyone who uses it must pay the company. In contrast, open source software development models make the human readable source code of programs available to anyone who wishes to access it and

allows for distribution and modification of programs. For software to be certified as open source by the Open Source Initiative (OSI), "the software must be distributed under a license that guarantees the right to read, redistribute, modify, and use the software freely" (OSI, 2003). Open source software can usually be obtained free of cost, although open source licenses do not require this to be the case. When programmers can read, distribute and modify software code, a large community becomes involved in the development effort, allowing bug fixes and enhancements to occur rapidly. Open source software has become more available and successful in the last decade largely due to the growth of the Internet, which has provided the medium for collaboration and sharing on which open source models are built (Goetz, 2003; Lessig, 1999).

Open source development is primarily associated with software production. Most of the software applications schools require are available in the form of stable and proven open source software including word processing, spreadsheets, presentations, e–mail, scheduling, Web browsing, and image manipulation, to name a few. One of the widely applicable of these applications is OpenOffice. OpenOffice is a highly developed office suite that is comparable to any serious commercial package, including Microsoft Office (Olavsrud, 2003). The program contains a word processor, spreadsheet, presentation manager, and drawing program. It can be run on the Linux, Windows or Macintosh operating systems. OpenOffice saves documents in its own file formats and can work with others as well, including formats used for Microsoft Office documents [4]. OpenOffice is appropriate for most all school purposes as it has all the functionality that would be required for average and advanced users. The fact that it can be run on a number of operating systems and works with documents that have been created with other office suites, makes it a versatile package that can easily be deployed in schools. OpenOffice can be downloaded free of cost and would be an easy transition for students and staff who are familiar with other office suites.

Operating systems are a basic and necessary part of any computing environment. The main challenger to the domination of Microsoft's Windows these days is Linux, the best known of all open source software projects. Linux is recognized as a robust and stable server operating system, and has also been making headway demonstrating its potential on the desktop. A number of companies produce their own flavor of Linux and, depending on the precise needs of the school, the Linux operating system can be obtained free of cost or for a modest fee. If schools are uncomfortable going it alone with a free downloaded version of Linux, they can easily pick up various support options from one of the Linux companies for a fee [5]. Linux can be installed on most PC or Macintosh computers. Even older PCs that are unable to run current versions of Windows can often run recent versions of Linux due to its lower hardware requirements. A desktop user who is new to Linux would notice some differences from a Windows environment, but would have little trouble adjusting to some of the more recent Linux desktop environments. In fact, many of the newer Linux desktops are designed to appear very similar to a Windows environment. One important difference that would be immediately noticed with most any Linux distribution is that the package not only provides the operating system but also most of the applications that would be needed.

More open source educational resources

There are many other types of open source projects emerging in addition to those aimed at software development (Stalder and Hirsh, 2002) that can benefit schools. Internet–based collaborative technologies are being used to develop online, text–based materials that are

intended for educational purposes. Such projects allow subject experts from around the world to work together to produce materials that are freely available to download, modify, print and distribute. Like software projects, these content development projects are noted for their rigorous review process and ability to be quickly updated as the need arises.

Many examples of text–based, content development projects are emerging. There are initiatives underway to develop online textbooks that can be used in subject areas commonly taught in schools. Wikibooks is a project "dedicated to developing and disseminating free, open content textbooks and other classroom texts." It currently hosts over 50 textbooks in varying stages of development. A similar project that is at earlier stages of development is the Open Textbook Project. It has the goal of developing "openly copyrighted (copylefted) textbooks using the free software development model." In addition to textbooks, an encyclopedia development project has proven very successful. Wikipedia has recently surpassed the Internet traffic received by the online version of *Encyclopaedia Britannica.*

Schools, in particular, can benefit from these projects as they get the chance to obtain high quality text–based resources, free of cost or usage restrictions. Unlike open source software projects that may prove technically challenging to educators who wish to participate in development, textbook and encyclopedia projects are closely aligned with the expertise of educators. Once educators become aware of these projects as users and contributors, a resource of immense value will be available to schools to be used as they see fit. Open source models can become a revolutionary source of innovation and opportunity for schools.

Advantages

Returning to the notion of schools as a commons, open source development has the potential to place resources in the hands of educators and students that can be used in ways that best support educational processes. One of the main advantages of using the products of open source development is that schools are able to avoid market enclosure. Commercial products are no longer an obligatory passage point (Callon, 1986; Latour, 1987) in obtaining many resources that are required in education. By eliminating the expense and constraints that accompany commercial products, educators and students gain greater control over the ways in which education is conducted. Open source products can be used by anyone, at anytime, in most any way they choose. The money that is no longer required for commercial products that have been replaced by open source products can be used to support other areas of need within the school.

Interestingly, an important advantage of schools using open source resources appears to be a reversal of one of the problems that has confronted traditional commons. One of the fundamental problems with most commons is overuse of the resources. Indeed, this concern is the basis of Hardin's (1968) well–known essay, "The Tragedy of the Commons." As more consumers of the resources provided by a particular commons take advantage of it, the resource can become depleted. In order to preserve the resource in a traditional commons, some sort of management strategy needs to be put in place. In contrast to traditional commons, open source projects can actually benefit from increased numbers of users. Software and Web sites are not depleted by those who copy or view the resources. Indeed, users can become co–developers as they provide feedback, suggestions, and improvements (Raymond, 1998). As Raymond (2000) points out, "widespread use of open-source software tends to increase its value ... . In this inverse commons, the grass grows taller when it's

grazed upon."

As schools begin to use open source products they will move closer to the ideal of a commons, while solving many problems that have confronted them in the past. As more schools move in this direction, the value and quality of the resources are likely to increase rather than be depleted. There are, however, several challenges that must be considered in order to begin taking advantage of open source products in a productive way.

Challenges

Beginning to use open source products requires educators to revisit some of their basic assumptions about the types of resources we use in schools and from where those resources should come. I am assuming that few educators would object to the concept of an educational commons, but many may have some anxiety about giving up many of the commercial products with which they have become comfortable. Commercial products are often useful and of high quality, but using them in cases where open source alternatives exist tends to lead to many of the problems I have been discussing in this article. Knowing this, educators need to become familiar with open source resources and explore their appropriateness for teaching and learning. If the resources are found to be appropriate, they should be used in place of commercial resources. In the case of software, for example, I would challenge educators to explain why OpenOffice could not replace the commercial office suites that are currently used on most school computers. Unless there is an excellent reason, the open source software should be used due to its overall suitability, low cost, and better alignment with educational values.

The sort of mindset that would move education toward greater use of open source resources is not currently in place. Most educators are not outraged by the corporate intrusion in the educational commons. We have a long history of such intrusions, although they seem to have intensified in recent times. Educators have become resigned to the necessity of some corporate involvement in education. From this perspective, it may appear more extreme to consider making use of open source resources than to continue using commercial ones. The ideal of an educational commons may serve to highlight that which is being lost as we hand more control over the educational enterprise to corporate interests. Becoming involved with open source resources offers more than just a way to cut costs: it contributes to returning the control of education back to the educators. The new mindset that will take education in the direction of leveraging open source development to support a commons is one that will come about partly as a result of educating educators and partly as an educational policy direction.

A second challenge faced in implementing open source resources is in educators taking on roles in open source development processes. To have high quality resources that meet the educational needs, it is important that educators be willing to participate in the development of various products. It is not uncommon that educators give feedback to producers of commercial products, particularly when opinions are solicited, but they must be more proactive about participating in open source projects. These projects do not typically have resources to solicit extensive feedback and contributions. Educators must understand the nature of open source development and seek ways to become involved. The development of software and other types of educational resources requires a wide variety of contributions and competencies. Becoming an active contributor to projects will ensure that a broad array of resources is produced that is educationally appropriate. The ultimate beneficiaries of such involvement will be students and

schools.

Conclusion

The vision of an educational commons characterized by easily available resources that are flexible, affordable, and high quality is an appealing one. Further, reducing corporate intrusion into education at the resource level is desirable. By providing the medium that enables collaborative, open source projects to thrive, the Internet is emerging as a key technological innovation that will allow schools to overcome some significant challenges. Already, resources are available that can be used in schools immediately. Others are under active development and will soon be ready for mainstream use. Perhaps most exciting are those that have not been developed yet. As educators learn about open source development models and re–consider some long held assumptions about how educational resources are produced, they can leverage open source processes to take control of meeting educational needs. In addition to producing substitutes for commercial resources, educators are likely to begin producing resources that are new and innovative. Education can quickly move toward the ideal of a commons and, perhaps more importantly, embrace the ideal of fostering a true innovative commons.

About the author

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Notes

1. Lessig, 2001, p. 85.

2. *Ibid.*

3. Hardin, 1968, p. 1247, emphasis in original.

4. OpenOffice has its own document format which is open source in that anyone can see how the documents are created. This allows other applications to freely incorporate the OpenOffice document format so that they can work with them. Many proprietary software companies, such as Microsoft, do not release their document formats, so other applications may have trouble working with their documents. OpenOffice has developed the ability to open and save in Microsoft Office formats, but this works imperfectly as the OpenOffice developers did not have access to the Microsoft format specifications.

5. At the time of writing, companies like Redhat are offering a Linux distribution with support to schools for as little as US$25 per computer. For more information on Redhat's packages see http://www. redhat.com/solutions/industries/education/.

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