

Open Source for Open Learning



IDLELO2: The Second African Conference on Digital Commons

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Introduction

It is an honour to be a sponsor of IDLELO2 and to bring you greetings from the Commonwealth of Learning, which supports FOSSFA enthusiastically for reasons that I shall explain. I first point out the parallel between the word IDLELO, which means a common grazing ground and the name of my organisation, the Commonwealth of Learning; COL. COL starts from the belief that learning is the common wealth of humankind.

FOSSFA's aim is to contribute to a global commons of powerful software. COL's aim is to take advantage of that global software commons by combining connectivity and learning resources to create a global intellectual commons accessible to the whole of humankind.

Throughout history the challenge of common grazing grounds has been the tragedy of the commons. Overgrazing occurs as individuals take more than their fair share and everyone loses. But the kind of commons we are creating is revolutionary. Our kind of commons cannot end in tragedy. Knowledge, learning and software are infinitely reproducible. My consumption at the commons does not reduce yours. Indeed, my consumption can enrich what is available to you, if I contribute to the commons the new knowledge or the new software that I have been able to create by grazing on the commons.

Our title is Open Source for Open Learning. COL is interested in the role of open source products in education, training and learning generally. We shall focus on the role that open source can play in open and distance learning or ODL.

ODL is the umbrella professional term for applying technology to learning. Other names are used, such as

eLearning, virtual learning, blended learning and distributed learning. We shall use ODL to designate all forms of technology-mediated learning because it evokes purpose as well as process. Open learning means education without barriers, just as open source means programming without barriers. Distance learning evokes ready access, flexibility and scale.

Why is ODL potentially a killer application of open source and why is the open source movement a revolutionary development for ODL?

Learning for Development

We answer the first question by pointing out that only by opening up new opportunities for learning to massive numbers of people will the world achieve the Millennium Development Goals.

Every one of the MDGs, not only the education and gender goals, represents a massive challenge of learning. To eliminate poverty and hunger, millions of farmers and smallholders need to learn new ways of doing things. To achieve the health goals people all over the world must learn how to keep themselves and their families well and free from disease. Conventional methods of teaching and learning cannot rise to the scale and scope of the development challenge.

Only open and distance learning can supply the massive increase of learning opportunities needed. If the open source movement can help to extend ODL it will create untold benefits for humankind. How will open source help open learning? In two ways: by cutting costs and empowering people. I start with the costs.

Throughout history education has been constrained by the iron triangle made up of the vectors of access, quality and cost or, if you prefer, quantity, quality and equity. The dilemma with conventional teaching methods is that you cannot improve things on one side of the triangle without worsening them on the others. Putting more people in a classroom increases access or quantity but is perceived to decrease quality. Supplying better learning materials increases costs, and so on.

In other areas of human endeavour technology allows us to mass produce quality goods and services at low cost. Only in recent decades have we begun to apply this technological revolution to education. However, the use of ODL in open universities and other large learning systems has made it possible to increase access, improve quality and cut costs - all at the same time. We have burst open and reconfigured the iron triangle. It is a genuine revolution. But it is not enough.

Another triangle haunts us at the beginning of this new century: the world economic pyramid. C.K.Prahalad has drawn attention to the imperative and the challenge of serving the four billion people at the bottom of this pyramid, many of whom live in Africa.

Prahalad's concern is to encourage business to serve these people, although he warns that serving them will require 'radical innovations in technology and business models', aspiring to 'an ideal of highly distributed small scale operations married to world-scale capabilities'.

My question is whether we can bring education, particularly tertiary and continuing education, to the bottom of the pyramid. Open and distance learning would have to be the basis of the approach, but ODL would need dramatically to cut its costs and equally dramatically to increase its local adaptability. The answer may lie partly in the use of open source systems.

The Economic Structure of ODL

I must take a minute to explain in simple terms the economic structure of open and distance learning, because this is the easiest way of demonstrating where open source solutions could make a difference.

The current generation of large ODL systems, such as the open universities, have two key assets. First they benefit from economies of scale because the marginal cost of serving an additional student is low. Second, they benefit from qualities of scale because large numbers both justify investment in quality materials and create local concentrations of students that facilitate face-to-face events.

We can represent the economies of scale by plotting the total cost of the teaching-learning system against total student numbers.

The plot for ODL gives rather a flat curve, although it starts quite high on the vertical axis. I'll come back to that, but note that the reason for the flat cost curve is basically that the learning materials used in ODL cost little to reproduce in bulk once you have made the first copy. Furthermore, this advantage increases with each new medium. DVD's cost less to reproduce than books. Downloading materials from the web, or listening to a TV or radio programme, costs almost nothing once reasonable bandwidth has become available.

Contrast this to the cost curve for face-to-face teaching. More students require more teachers so the curve rises more steeply. However, the investment cost for getting started is low. You can start with one teacher and one class. You can see there is a crossover point at which the unit costs of the two approaches are the same.

If we want to make a dramatic difference to the unit costs of ODL, so that it can be conducted economically at small scale, we must both lower the curve on the vertical axis and also make it even flatter. Open source solutions can help us meet both challenges.

The investment requirement that causes today's ODL curves to start well up the vertical axis pays for building or buying data-processing systems to manage large numbers of students and for preparing learning materials. Open source can reduce the costs of both.

Systems

In the case of the systems we are now seeing hybrids of closed and open source systems, at least for institutions of significant scope and scale. For example, the UK Open University, with 200,000 students

has opted for Moodle as its eLearning management system and will invest significant funds in adapting it for this complex institution. I expect that for the foreseeable future Moodle will run alongside the web-based Windows student record systems, CIRCE and OUTIS in which the University invested over \$20 million during my time as vice-chancellor.

Two weeks ago I came across an example of a new hybrid system, the Automated Section for Students' Evaluation and Support Services (ASSESS) of the Netaji Subhas Open University in Calcutta, a rapidly growing institution with 75,000 students. The University is also using the open source Brihaspati eLearning platform developed by the Indian Institute of Technology Kanpur. The impact of such systems is to flatten the cost curve by automating more and more operations. Using open source systems may also reduce the initial investment.

In putting together such systems institutions must be pragmatic, not dogmatic. Managers must overcome their reluctance to challenge their technical specialists and should engage with software decisions themselves in a systematic way. Prescribing choices between open source and proprietary software is not appropriate because each institutional situation must be reviewed on its merits.

We make seven points about blending open and closed source systems:

First, IT departments should have standard procedures for making decisions about acquiring hardware and software. Senior management's must ensure that these procedures avoid sub-optimal choices by taking the bigger institutional picture into account. COL has developed a decision making aid for acquiring a Learning Management System to assist with this (<http://www.col.org/Consultancies/04LMSEvaluation.htm>).

Determining which learning management system an institution should choose is not COL's role, but a management team can use this tool to work through the decision in a systematic way.

Second, decisions must be taken with a long-term perspective, looking beyond the present opportunity of a particular offer for a special licence-fee.

Third, the IT people must be able to assess what functions can be performed with open source software and be aware that not all open source software is free open source software. However, with open source the code is available, so the institution can usually make contributions and improvements to it.

Fourth, institutions need to balance the merits of specialisation with cross-training so that IT staff can work competently in both Linux and Windows environments. Having cross-trained IT staff is the best way of ensuring that an institution gets the best out of both closed and open source solutions.

Fifth, remember that including Linux in an organisation does not mean having to change everyone's computer. The server room is likely to be the first place for FOSS applications to appear. Money saved by using a free product can be applied to applications where a free product is not an alternative.

Sixth, teaching institutions should aim for variety and specialisation in setting up computer labs. Teaching a particular application (e.g. Lotus) requires the systems for that task, but teaching generic concepts and skills, such as word processing, spreadsheets and presentations can use free systems like Linux and Open Office, saving thousands of dollars in licence fees.

Seventh, it is particularly important to encourage students in developing countries to write code for open source software so that they can join the worldwide community of code writers. I am delighted to see the emergence of AVOIR, the network of code programmers animated by Derek Keats across Africa. This is very empowering. COL would be very pleased to hear from universities who are willing to have students contribute to the programme code of our Learning Object Repository, by creating features which everyone can benefit from. This is an open source LOR that can link a network of LORs together.

Materials

We turn now to the creation of materials. Quality materials are both a major strength and a major investment for good ODL systems. In principle the investment required could be substantially reduced by the sharing and adapting of existing materials but the reality has been disappointing so far.

COL is proud to have helped the four open universities in Bangladesh, India, Pakistan and Sri Lanka to develop Executive MBA and MPA programmes which are now being adopted in Malaysia and Nigeria. Similarly a diploma programme for teachers of Technical and Vocational Education in the Caribbean countries developed with COL's help by Jamaica's University of Technology is now being adopted in Ghana and Pakistan.

Sadly, such examples are the exception that proves the rule. Why has course sharing been so limited? One answer is the 'not-invented-here' syndrome that has a special hold on university teachers even though it is becoming less strong. The greater obstacles are the sheer difficulty of sharing and adapting materials that are not in digital format and ensuring respect of copyright.

This is where the open source movement could create a revolution by extending its philosophy to the creation of Open Educational Resources, which are open course content, open source software, and tools. We now have the possibility not only to share and adapt readily the materials held in Learning Object Repositories, but also the means to develop learning materials collaboratively across the globe. Communities creating Open Educational Resources are analogous to the communities that develop open source software.

COL is involved in one such initiative, a network called the Virtual University for Small States of the Commonwealth, which illustrates the opportunity well. Back in 2000, when the Commonwealth ministers of education met amid all the hype of the dot.com frenzy, ministers from the small states - the 33 Commonwealth countries with populations of less than 4 million - worried about how they would achieve the critical mass of expertise and equipment to join the e-world.

They decided that the answer lay in collaboration and COL is now helping them implement a

collaborative network through which teachers in groups of small states will work together electronically to develop open educational resources on topics of common priority such as tourism, professional development for teacher and nurses, and vocational subjects. Open source will be the name of the game and each state and institution will make the local adaptations necessary for its own special context.

Note that developing courses as OERs by electronic collaboration does not mean that they can only be delivered by eLearning. Many of the Commonwealth's small states do not yet have extensive connectivity so a variety of distance learning methods will be used to bring them to students, both inside and outside institutions. This does not reduce the advantages of developing the courses as OERS.

We are not planning to standardise on a single open source Learning Management System because several are already in use and interoperability between them is getting rapidly better. It is also good to see the emergence of Learning Management Systems in Africa, such as KEWL.NextGen, which is well adapted to situations of low bandwidth and will allow the mirroring of content and discussions between multiple instances of the system, possibly installed in multiple countries. From COL's side, a key player in this will be South Africa's Dr Wayne Mackintosh, who joins us in May, after being centrally involved in the development of the open source eXe system in New Zealand which enables educators to create digital learning content for online learning without having to have HTML skills.

I am pleased to say that of the 22 states participating in the network, seven are Commonwealth small states in Africa, that is to say Botswana, The Gambia, Lesotho, Mauritius, Namibia, Seychelles and Swaziland. There is nothing exclusive about this network. These countries got together because they wanted to avoid simply being tributary to developments in larger states. However, once they feel they have acquired the know-how to hold their own in the e-world they will be delighted to review and adapt materials from larger states. Learning content developed in the next phase of these developments will be made freely available via the COL Learning Object Repository.

These are small beginnings but COL believes that this network, the Virtual University for Small States of the Commonwealth, is a very good test for the potential of open source to take open and distance learning to the next stage of low cost, long reach and high flexibility. The Commonwealth-wide community that will work on these open educational resources is inspired by the same principles as the communities that work together to develop open source software.

We hope to show that open source and open learning are two sides of the same coin and that open educational resources are the key to the dramatic changes in cost and flexibility necessary to extend learning opportunities to all people.