

Open Content, Open Access and Open Source?

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“Knowledge in the form of an informational commodity indispensable to productive power is already, and will continue to be, a major – perhaps the major – stake in the worldwide competition for power. It is conceivable that the nation-states will one day fight for control of information, just as they battled in the past for control over territory, and afterwards for control of access to and exploitation of raw materials and cheap labor.”

-- Jean-François Lyotard (1979)¹

“Abe and Moe run into each other on Flatbush Avenue.
‘Boy, have I got a deal for you Moe’, says Abe. ‘I’ve got these fancy new university courses, computers and everything, you can take it right from your own living room. What do you think?’
‘Sounds nice’, says Moe, ‘How much?’
‘For you, my friend, a bargain’, says Abe, ‘Only three hundred dollars.’
‘I’ll take it’, says Moe.
Four months later they run into each other again.
‘Hey Abe, you crook’, says Moe, ‘Remember that course you sold me?’
‘Sure’, says Abe, ‘what about it?’
‘It was lousy’, says Moe, ‘I didn’t learn a thing.’
‘Moe, you dummy, of course you didn’t’, says Abe. ‘That was a buying and selling course, not a learning course!’”

-- Nobel (1998)²

“David Lubars, a senior ad executive in the Omnicom Group, explains the industry’s guiding principle with more candor than most. Consumers, he says, ‘are like roaches - you spray them and spray them and they get immune after a while.’”

-- Naomi Klein (2000)³

Introduction

Noble (1998)⁴ states that due to two different commodification phases, higher education institutions have been subjected to the “systematic conversion of intellectual activity into intellectual capital and, hence, intellectual property”. The first phase began in the mid 1970s when research outputs were viewed as one of the most important assets of a “knowledge-based” society by corporate and political leaders in order that they sustain their monopolistic controls. “Within a decade there was a proliferation of industrial partnerships and new proprietary arrangements, as industrialists and their campus counterparts invented ways to socialise the risks and costs of creating this knowledge while privatizing the benefits”. Noble (1998) further argues that the development of these partnerships resulted in the relaxation of antitrust regulations, greater tax incentives for corporate university research funding, reform of the patent law that gave universities automatic ownership of patents resulting from federal government grants and a reallocation of resources away from teaching toward research. Consequently, the teaching function of universities was re-organised (bigger classes, increased tuition fees, decreased staff compensation budgets) to support a bloated bureaucracy required to sustain the ‘new-economy’ (commercial activity) of the institution.

The commodification of instruction (the second phase) Noble argues was introduced as a solution to solve the crisis created by the first phase. Here “the activity of instruction itself into commercially viable proprietary products that can be owned and bought and sold in the market” is seen as a means to increase revenue and decrease the teaching costs. However, other issues also drove the commodification of instructional materials. One such issue was that teachers could be treated as labour drawn into an efficient production process and once a course is on-line “administrators gain much greater direct control over faculty performance and course content than ever before and the potential for administrative scrutiny, supervision, regimentation, discipline and even censorship increase dramatically”.

Noble correctly draws our attention to the commodification of education that could therefore be more clearly defined as the “commercialisation of scientific and cultural activities through the increasing pressure conveyed through ‘funding mechanisms’ to orient activity towards serving commercial rather than human interests” (a definition from the Marxists Internet Archive)⁵. However, this is only one aspect of a complex number of interrelated tensions manipulating educational institutions in the quest for control, efficiency and power. In this paper we will briefly look at a number of issues related to the functions of a university (teaching and learning on the one side and research on the other) that threaten the sustainability and growth of scholarship. It is our intention not to provide answers to complex issues, but to provide information and arguments to foster discussion. Consequently we might raise contentious issues without providing insights or critiques.

Roberts (1998)⁶ states that Jean-Francois Lyotard is “arguably one of the most important” authors addressing postmodern themes for educationists, as Lyotard (1978)⁷ rightly argued that nation-states would take control over information.

Therefore, the experiences related and discussed by Noble in his series the “Digital Diploma Mills” (see above) could be viewed as a realisation of the ideas of Lyotard. Is the commodification of research findings and instructional material nothing more than the natural progress of capitalism in a postmodern world?

However, “when we examine the current status of scientific knowledge at a time when science seems more completely subordinated to the prevailing powers than ever before and, along with the new technologies reveals “that knowledge and power are simply two sides of the same question: who decides what knowledge is, and who knows what needs to be decided? In the computer age, the question of knowledge is now more than ever a question of government” (Lyotard, 1978).

The relationship between commodification and power is clear in the current administrative processes of tertiary education. Roberts (1998) argues that in New Zealand, just as in South African educational governance, the development of a National Qualification Authority resulted in a bureaucratic body based on unit standards (educational products) that students purchase from competing providers.

Educational leaders might respond that in a globalised world there is no option but to become part of such a system in order to provide education to their *clients*.

Wars are never fought for altruistic reasons. They’re usually fought for hegemony – for business. And then, of course, there’s the business of war.

‘In his book on globalization, *The Lexus and the Olive Tree*, Friedman says, ‘The hidden hand of the market will never work without the hidden fist. McDonald’s cannot flourish without McDonnell Douglas ... and the hidden fist that keeps the world safe for Silicon Valley’s technologies to flourish is called the U.S. Army, Air Force, Navy and Marine Corps.’ Perhaps this was written in a moment of vulnerability – but it’s certainly the most succinct, accurate description of the project of corporate globalization that I have read. (Arundhati Roy 2002)⁸

Today’s era of globalization, which replaced the Cold War, is a similar international system, with its own unique attributes. To begin with, the globalization system, unlike the Cold War system, is not static, but a dynamic ongoing process: globalization involves the inexorable integration of markets, nation-states, and technologies to a degree never witnessed before -- in a way that is enabling individuals, corporations, and nation-states to reach around the world farther, faster, deeper, and cheaper than ever before, and in a way that is also producing a powerful backlash from those brutalized or left behind by this new system. (Friedman 2002)⁹

Therefore, commodification is closely allied to globalisation that is supported by the information and communication revolutions. Therefore educational entities could be viewed from two perspectives: (1) creation, publication and access to scholarly information; and (2) relationships between information and knowledge (educational pedagogy).

Creation, Publication and Access to Scholarly Information

In the past, academics shared their work with any other interested persons by publishing articles in scholarly publications. Journals were started in the 17th century to publicise work done by scientists to other people working in the same field. One of the earliest journals started for this purpose was the *Proceedings of the Royal Society*, begun in the late 1660s and still publishing. No author was paid – patronage of important persons and the subscriptions themselves helped to cover journal publishing costs. Scholarly societies and university presses continued to carry the burden of publication well into the 20th century, in the interests of communicating research results and stimulating academic debate. All along, libraries were the obvious places to make these publications available to all, and the system worked well (Merrett 2004).¹⁰

However, in the mid 20th century, Robert Maxwell (owner of Pergamon Press) spotted a commercial opportunity and started buying up small academic and scholarly presses and taking over academic journals for commercial purposes (Merrett 2004). The attraction for academics was that Maxwell would take over all the onerous, irritating and time-consuming work of publishing and the problems of keeping to publication dates, and leave scholars to do the “real work”, undertaking research and documenting their findings (writing and speaking). The standards of the journals would continue to be assured by the peer-review system, and authors and reviewers would continue to be unpaid. In order to maintain the increased administrative bureaucracies associated with publication, authors were required to pay to publish and for copies of their articles. In addition, authors also relinquished their copyrights to the publishers.

Also the criteria for what was a “good” journal were subtly changed from an emphasis on content to one on delivery – the regularity of the journal publication, for example. The first criterion for the inclusion of a journal in one of the Institution for Scientific Information’s Citation Indexes is that it is published regularly. If a journal is not published regularly, it will not be included – no matter if it meets all the other criteria.

With the arrival of the information and communication revolution and associated technology, publishing houses were driven by market forces to extend their publishing processes into the digital era.

Finally, and significantly, all these factors resulted in increased journal prices; up to 16 times as much per citation (Bergstrom and Bergstrom 2004).¹¹ The trend started by Robert Maxwell was continued by large-scale publishing monopolies, such as Reed-Elsevier, which produced expensive journals with huge profit margins (Merrett 2004).

In effect, the academic endeavour was unbelievably exploited – to get an article published in a high-status journal took time and effort, and entailed virtually giving away one’s research, paying to have the research published and then paying to see the results, or having one’s institutional library pay (in some cases 90% of library budgets are spent on journals). There was not much choice here, as national research funding agents finance research published mostly in expensive journals.

A closer examination of the evolution of research publications provides insights into these processes. Before the printing press the church was the keeper and controller (controlling power) of information. The dawn of the industrial revolution allowed for the

growth of one of the most powerful commodities of our modern society, the publishing franchises. However, the advent of the Internet disrupted the process of publication and, for the first time in world history, provided those with access to technology a way to express their ideas with little fear of censorship or editorial review.

Tommy Hilfiger, meanwhile, is less in the business of manufacturing clothes than he is in the business of signing his name. The company is run entirely through licensing agreements, with Hilfiger commissioning all its products from a group of other companies: Jockey International makes Hilfiger underwear, Pepe Jeans London makes Hilfiger jeans, Oxford Industries make Tommy shirts, the Stride Rite Corporation makes its footwear. What does Tommy Hilfiger manufacture? Nothing at all. (Naomi Klein, 2000)¹²

Klein (2000) argues that the old paradigm of using marketing to sell a product was replaced by the new model where “the product always takes a back seat to the real product, the brand, and the selling of the brand acquired an extra component that can only be described as spiritual”. Branding is therefore inexorably linked to commodification and is part of the evolution of every product. Modern publication houses such as Reed-Elsevier therefore fit the Hilfiger model: all they do is repackage and take ownership of individual thought and insights and return to institutions such information in order to maintain their power and increase their market share (power). The commercial possibilities of such journals rest on the assumption of academics and bodies supporting research that the journals which attract most articles are in fact the best (*argumentum ad populum?*).¹³ Evaluations of journals by so-called independent but in fact interested parties such as the Institute for Scientific Information also rest on how many times a journal has been cited rather than on its content, the quality of which is considered assured, because it is peer-reviewed.

Some journals are not indexed in ISI Indexes because they do not meet the ISI criteria, and bodies funding research use ISI journal lists as an indication of which journals are publishing the best research without much further examination of the journals concerned. It is arguable that this is partly because of the sheer mass of publication, in which the ISI system at least provides some evaluation; but again it is quantitatively based, and quality is assumed. Here the industry reinforces its own “branding” strategies.

However these companies have taken the ownership (read control) to new levels through the use of digital publications (use of indexes from the early 1970s and availability of electronic text from the late 1990s). Now, instead of journal issues being sold and becoming the property of the buyer, as is the case for print journals, the e-journal is hired or rented out by the year; the subscriber buys access for a year to that journal and all preceding years one has paid for. As soon as the subscription lapses, however, access to all that has been previously paid for ceases. Further profit is made possible by the limitations on concurrent use, with price of access rising dramatically with increased number of users – in comparison with print journals, for which no

additional cost for usage has been possible. This is similar to the pay-and-repay model used by some software and hardware vendors (see below).

Other issues related to copyright and patents are also involved in this process of commodification of research findings. Nayyer (2002)¹⁴ argues that “globalization of information and the impact of the Internet tend toward an international standard of strengthened intellectual property laws and the erosion of sovereignty notions, with the economic benefits flowing primarily to developed nations and transnational corporations”. The multinational General Agreement on Tariffs and Trade (GATT) negotiations and the Trade Related Aspects of Intellectual Property (TRIPS) extended copyright protection to 70 years and laid the foundation for the harmonising of intellectual property across national boundaries.

According to Loren (1999)¹⁵ “the ultimate aim of copyright in the United States, as stated in the Constitution, is the promotion of knowledge and learning” but “has evolved into a profit-maximizing tool for the powerful content industry”. However the adoption of the No Electronic Theft (NET) Act of 1997 has criminalised copyright infringement, because the only “element of the offence of criminal infringement that stands between legitimate protection for copyright owners and illegitimate criminalisation of widespread practices of individuals is the requirement that the infringement is willful”, which is generally “subjected to varying interpretation depending on the context of its use”.

Therefore, the globalisation and commodification of research findings by both big business and government, especially those in the first world, is nothing more than an uncontrolled expansion of their power at the expense of the creator of knowledge (exploitation). Here the voice of Makere Harawira (1999)¹⁶ is appropriate: “Neo-imperialism is multi-layered and multi-faceted. In a time of rampant global capitalism gone mad, there is nothing on, above or beneath the planet that is protected against the blatant theft, exploitation and misuse of knowledge and resources.”

Therefore the practices of commodification that are part of globalisation include changes to copyright and intellectual property laws and, therefore, as part of neo-imperialism should rather be called neo-commodification.

Relationships between Information and Knowledge

The second phase of education relates to the commodification of educational content. Over the past 10 years there has been a steady increase in the use of technology in the classroom. While computers were initially used as devices to teach learners how to use the technology, very soon it was argued that the power associated with a computer allied to widespread Internet connectivity could provide access to information that would lead to better learning outcomes. While the history of the use of technology in the classroom is complex and diverse, we will consider one of the most important neo-commodification products available today: Reusable Learning Objects (RLO).

The original conceptualisation of a RLO is attributed to Wayne Hodgins (Director of Worldwide Learning Strategies, Autodesk Inc, Chair, Institute of Electrical and Electronics Engineers [IEEE] Learning Technology Standards Committee [LTSC] Learning Object Metadata) who made the deductive jump that learning could be

assembled from a number of blocks just like objects can be built using LEGO blocks. He called such blocks of information “learning objects”. During the 1990s there were a number of groups who worked on this concept and included the Learning Object Metadata Group from the National Institute of Science and Technology, IEEE and ARIADNE¹⁷ in Europe to name a few. In the mid-1990s Oracle developed its Oracle Learning Application (OLA) to provide an authoring system where learning objects wrapped in Java code could be supplied to learning when required. However this initiative was never fully realised and the system developers moved to Cisco where their work continued. Driven by the U.S. military and the powerful e-learning industry leaders, including Microsoft, Oracle and Cisco, a new standard was soon defined where learning management systems could share such objects: Sharable Content Object Reference Model (SCORM). Learning content is therefore now just a product defined through a number of standards that allow complex software to deliver these objects when required by a learner. Of course, payment for such objects is assumed.

Jacobsen (2001)¹⁸ argues that “RLO will mature in the corporate learning environment” where “XML-based intelligent tutors and coaches will be a viable feature; collaborative filtering will emerge from the research labs and further tailor learning to the individual; copyright and payment issues will slow RLO adoption; RLO application will move from research to mainstream academia; Learning objects will self-construct context, learn from learners and improve themselves dynamically; RLO delivery will move directly to the consumer; and personalised learning will make its way into elementary education”. RLO appears to be a Nirvana to all instructivists who believe that information flowing into the empty vessels (learners) is all that is required in an educational system.

Learning management systems that now support RLO and SCORM, for example, WebCT and Blackboard, have recently drastically increased their licence costs. “This is a typical tactic of the large-scale software systems that are in use in education – attracting our business with a product [at a low price] to prevent us from developing a product in-house, and then raising the price later,’ says James Hammond, associate vice president for information technology at Winthrop University, which has purchased software from WebCT for several years” (Young 2002).¹⁹ While it is generally accepted that only software licences and not the code are traded (the norm), some companies base their licence agreements of annual payment for the right to use such software. The pricing of such pay-and-pay-again licences is therefore not driven by market forces but by the need to generate increased profits and organisations committed to such agreements are soon caught in a never-ending cycle of upgrades and increasing operational costs. When NASA was faced with such a problem due to the licences associated with the Oracle database, they chose to change to an Open Source database product (MySQL).

The development of RLOs is also a complex process especially when standard compliance is tied to technology that is proprietary. So while the standard for operability may be open, the implementation thereof is closed and often tied to patents and use of copyright materials.

Therefore the neo-commodification of information into learning objects which promises to solve all educational problems has yet to convince many educational theorists who believe that learning has nothing to do with content *per se* but with learning processes where new information is integrated into existing meta models through social construction. However, the ‘learning’ debate – instructivism versus social constructivism – is not taken up here; the commodification of learning content has added two additional prerequisites to the neo-commodification: adherence to standards and proprietary software.

What Can We Do?

The arguments proposed by Noble that modern education institutions’ administration is driven by two different commodification phases is far more complex than has been discussed and requires an understanding not only of the nature of knowledge and knowing, but also an understanding that technology provides powerful government tools to expand power and wealth. However, the same technology also provides powerful means to counteract neo-imperialism. In the next section we look at ways that technology can be harnessed to protect our intellectual activity and thereby contribute to the global village in a fair and humane manner. This part of the paper starts with a discussion of free versus proprietary software in order to highlight important concepts relevant to the rest of the discussion. Thereafter options for copyright are explored, the use of open content and finally the Open Access model of publication that is closely associated to the preservation of institutional digital materials is explored.

The Free Software Foundation (FSF), founded in 1985, is dedicated to promoting computer users’ right to use, study, copy, modify, and redistribute computer programs. The FSF promotes the development and use of free (as in freedom) software --- particularly the GNU operating system (used widely today in its GNU/Linux variant) --- and free (as in freedom) documentation. The FSF also helps to spread awareness of the ethical and political issues of freedom in the use of software. (Free Software Foundation)²⁰

More precisely, free software refers to four kinds of freedom:²¹

- The freedom to run the program, for any purpose.
- The freedom to study how the program works, and adapt it to your needs. Access to the source code (computer language) is a precondition for this.
- The freedom to redistribute copies so you can help your neighbour.
- The freedom to improve the program, and release your improvements to the public, so that the whole community benefits. Access to the source code is a precondition for this.

Most users today are aware of Open Source, which is often confused with free software. The Open Source software licence is different from that defined by the Free

Software Foundation (GNU General Public License).²² The most vocal authority of the Free Software Foundation is Richard Stallman who has attempted to convince the Open Source community to use the GPL but also stated that there is no reason not to run software released under Open Source licence. Allied with the free/open source movement is the use of open standards for the publication of digital data that will ensure that individual knowledge is never locked in proprietary file formats that might not be readable in the future.

Notwithstanding the issues related to free/open software, it is four freedoms that should guide our understanding and could be rewritten to protect not only software but all other intellectual activity. Therefore, free intellectual activity refers to:

- The freedom to access all information.
- The freedom to study information, and use such information to suit our needs to develop an understanding of the world we live in.
- The freedom to redistribute copies so to help our neighbours.
- The freedom to improve concepts and thereby our understanding of the world and to publish such improvements to the public, so that the whole community benefits.

However, for such freedoms to exist we need to find ways to negotiate copyright, foster intellectual publishing and protection of digital resources.

It has been argued that Open Source of GPL software is less likely to contain coding errors as the code is subjected to review by many programmers not directly associated with the product and the total cost of ownership of such software is often cheaper. While companies which produce proprietary software dispute these claims, such software products are market leaders in some areas (Figure 1).

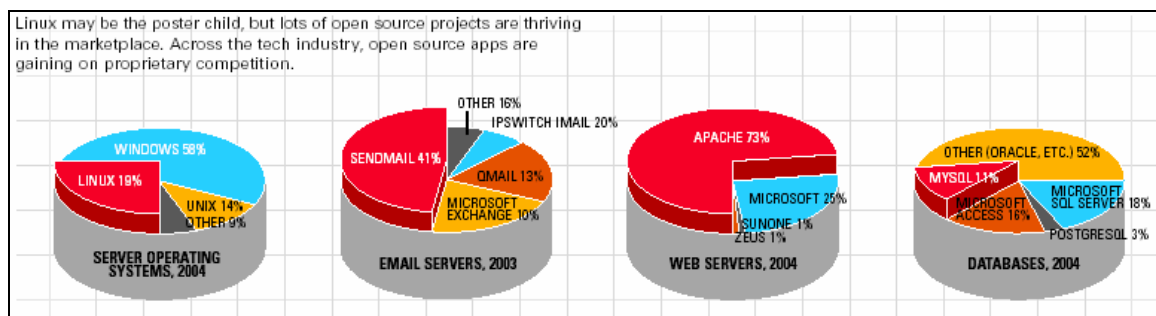






Figure 1. The proof is in the market share.²³

Therefore, the free/open source movement has released products that can be used in place of and some that also outperform proprietary products.

Other problems associated with copyright laws can in some cases be solved by the licences developed by the Digital Creative Commons. Copyright is automatically given to every piece of work – new or derived – created. The author of any creative product

therefore has exclusive right to copy and distribute that product. For neo-commodification to work we transfer such rights to a third party thereby relinquishing all rights to the work. The Digital Creative Commons provides a number of different licences that more carefully describe what others can do with the author's work and include:²⁴

-  **Attribution**
Others may copy, derive, distribute, display and perform your copyrighted work if they give you credit.
-  **Non-commercial**
Others may copy, derive, distribute, display and perform your copyrighted work but for non-commercial purposes only.
-  **No Derivative Works**
Others may copy, distribute, display and perform your copyrighted work but not any derivative works based upon it.
-  **Share Alike**
Others may distribute derivative works only under a licence identical to the license that governs your work.

The use of a GPL and Digital Creative Commons licence allows for content to meet the four freedoms defined above. However, the financial consequences of the commercial exploitation of academic capital by commercial publishers have been such that clearly some effective solution has to be found. We can either find ways of paying the (increasingly more expensive) piper, or, calling the tune differently, thereby protecting our freedoms.

The development of joint buying consortia all over the academic world to deal with inflating journal costs has to some extent been successful. This is a proven successful alternative to individual institutional spending and a way of developing more effective bargaining power. Knowledge (certainly in a national context) of information needs is built up, and the cost savings can be fairly substantial. A South African consortium project, SASLI, which negotiates for higher education libraries, saved R150 million in journal costs in 2002. Another advantage of consortia is that they are potentially useful pressure groups because they are organised groups of customers. However, such approaches do not deal with the root of the problem and can not grant us freedoms.

There is a growing number of open access initiatives such as the Public Library of Science (PLOS), the Open Archives Initiative, Scholarly Publishing and Academic Resources Coalition (SPARC), the Budapest Open Access Initiative (BI), and others. A growing number of major libraries are cancelling subscriptions with publishers such as Reed-Elsevier and moving to open access sources. This has led to a significant drop in some journal prices, so perhaps the most effective strategy is a combination of consortial pressure and solid support of open source initiatives. As Merrett bluntly states, commercial publishers only own their own titles and their subscription lists (2004). They are dependent on authors for journal content. If authors could be certain that their work would, as well as being more widely accessible, be accredited for research funding, and

that leading names in major academic fields were going this way, they would surely welcome an opportunity to publish their work in open access sources.

Arguably, this process will take time to develop critical impetus. It will also depend on whether academics can work together to stop their own exploitation. It would be interesting to speculate on what would happen to the publishing monopolies should their golden geese fly away, as well as to speculate about what universities would do with any funds freed up in the process.

Despite the onslaught of neo-commodification, the scholarly processes of research, teaching and learning are today mostly “born digital”, and exist only in electronic format. Electronic communication presents a growing challenge for the scholarly community to develop new organisational, technical and economic models that address the limitations on access typical of the print information environment. The potential of the open access movement and the opportunities presented to African scholarship to access the information that is available online, remains unrealised if the academic community continues to use and support restrictive distribution practices that were developed for the print era, and grafted on to the electronic age.²⁵

The Open Access movement is built on two complementary strategies – open access journals (discussed above) and the development of institutional repositories (to protect intellectual property and to support the freedom to access information). The institutional repository is a close equivalent of the tools of the publishing revolution of the 15th century, creating an innovative platform for open access, open source and open content, both in the assembly and the delivery of information. In addition, as the digital record of scholarly achievement increases, the long-term preservation of these resources must be assured.

There are two functions of such a digital repository system. The first is to preserve the bit stream across technologies and through time. Despite strong investment in information technology, there remains a critical, cumulative weakness in our information infrastructure. The long-term preservation of scholarly resources is threatened by short media life expectancy, obsolete hardware – even a single software version change could render older file formats unreadable. The second is to provide access to “orphaned content”, resulting from defunct websites and other publishing sites that cannot guarantee future access.

Institutional repositories are seen as a key component of any long-term strategy to ensure the preservation of digital publications. Digital preservation has three main approaches: finding technological solutions to obsolete hardware and software; media preservation, where storage media are superseded by newer media, such as tapes, magnetic disks and optical disks; and intellectual preservation, in securing the integrity and authenticity of the information as originally recorded.²⁶

The failure of African scholarship to confront the challenges of digital preservation in striving towards open access is analogous to cultural and intellectual poverty, squandering the long-term rewards and the rightful acknowledgement of local and indigenous knowledge. It could be argued that the neo-commodification of indigenous knowledge will occur with or without our participation. Keeping digital

resources accessible for use by future generations will require conscious effort and continual investment.²⁷

An institutional repository could provide a catalyst in revolutionizing scholarly communication, providing African universities with an indicator of the quality, demonstrated in the scientific and societal relevance of its research output. Open access to that output is an imperative for developing countries, in the context of a growing concern for the increasing research “output gap”, which defines the real knowledge divide between rich and poor nations. The developing world accounts for less than 2.5% of the world’s scientific research publications.²⁸

A Future?

This paper attempts to raise a number of issues related to academic activity (research and learning) in a postmodern world where neo-commodification of intellectual knowledge is one of the cornerstones of neo-imperialism. While it would be impossible to disregard these processes of globalisation, the same technology that drives globalisation can also be used to foster generic freedoms of academic life and contribute to the protection of our own insights. University administrators, educational managers, scholars and learners each need to make informed decisions and make use of the available tools and practices (open content, open access and open source) to build educational institutions not driven by subjugation to market forces but as part of a community of people exploring the world to learn ways to improve the world condition. Finally, it should also be noted that this paper was written with open access information.

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