
Open Educational Resources within a Knowledge System for Achieving Quality Education SDG

Lena Nyahodza

UCT Libraries, University of Cape Town, Cape Town, South Africa
lena.nyahodza@uct.ac.za

Reggie Raju

UCT Libraries, University of Cape Town, Cape Town, South Africa.
Reggie.raju@uct.ac.za



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Abstract:

The high levels of poverty and poor access to quality education, among a myriad of other challenges, have contributed to economic and social exclusion in Africa. These exclusions must be viewed against the backdrop of the emergence of a global knowledge-based society in which the production and dissemination of knowledge has become critical for meeting social and economic needs. Education, in the view of Breidlid (2009), is critical for poverty alleviation and economic and social inclusion. Education is central to promoting sustainable development. It is therefore essential to mobilize necessary resources, including openness resources to steer the global south towards economic and social inclusion.

This paper will discuss the exploration of a 'knowledge system' that facilitates the networking of open educational resources (OERs) to strengthen the educational system in Africa. The bringing together of contributors who use appropriate technology for innovation will enhance the educational process which will in turn advance learning for growth and development. Key to the effective contribution of knowledge systems to SDGs is information and communication technologies (ICTs). Libraries have responded positively to the potential of ICTs and have recently been utilising that potential to offer publishing services using Open Source Systems (OSS) such as Open Journal Systems (OJS), DSpace, and the Open Monograph Press (OMP). These open source systems, which are a significant component of the openness movement, are exploited to deliver open content which includes open access publishing and sharing of scholarly content. The bias in this paper is the publishing of open educational resources for the development of education in the global south. An educated and informed society will contribute to the broadening of access to wealth for social justice, growth and development.

Keywords: sustainable development, SDG, open educational resources, quality education, open source systems, knowledge systems

1.1 Introduction

The magnitude of the challenges that beset Africa is extremely onerous. These challenges are spiralling out of control compelling world bodies to come together to develop a roadmap for the positive growth and development of Africa. The Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDG) were developed as this roadmap or global framework for collective action to reduce poverty and improve the lives of poverty stricken people as well as to improve health, education, living conditions, environmental sustainability and gender equality.

It is the view of the authors, the core of the roadmap is the quality education SDG. This assertion agrees with Breidlid (2009) who posits that education is critical for promoting sustainable development. The inclusion of quality education as a SDG will promote education as a key agent for change and emphasize the importance of lifelong learning for sustainable development. Further, this integration will bring about change in behaviour that will create a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations. The authors further agrees with Bird, Lutz and Warwick (2008: 36) that “education. . . can shape the world tomorrow, equipping individuals and societies with the skills, perspectives, knowledge and values to live and work in a sustainable manner.”

The authors maintain, like many others such as UNESCO, that access to quality education is the springboard to growth and development (UNESCO, 2017). Acknowledging that much has to be done with the other SDGs for holistic growth and development, this paper will focus on a discussion on the sharing of scholarly content, including OERs, which is a significant driver for innovation and change: change in terms of improving living conditions in the global south. The most significant conduit to economic emancipation and social inclusion is quality education starting at the primary level and surging upwards to tertiary level, including support for informal learning settings.

The bringing together of contributors, appropriate technology and innovation enhances the educational process which will advance learning for the growth and development of the global south. Key to the connectivity of knowledge systems to SDGs is information and communication technologies. This is endorsed by Ahmed (2007: 377) who posits that ICTs has great potential to advance sustainable development. Libraries have responded positively to the potential of ICTs and have recently been utilising that potential to offer an openness service such as a publishing using Open Source Systems (OSS) such as Open Journal Systems (OJS), DSpace, and the Open Monograph Press (OMP). The openness movement brings together collaborators to openly share information in ways that underpin social justice. The open source systems, which are a significant component of the openness movement, are exploited by the openness movement to deliver open content via such channels as open access publishing of journals, monographs and OERs.

This paper will discuss three key issues, namely knowledge systems, sustainable development and open educational resources. These three issues come together to address the principle issues of economic deprivation (fuelling poverty and high mortality rates), social exclusion and other ills that SDGs seek to address. The optimistic view of openness advocates that a knowledge system enriched with open educational resource will be a stimulus for economic and social inclusion. Due to constraints of space the authors will discuss, albeit very briefly, the publishing of open educational resources for the development of education in the global south and how it will contribute to an educated and informed

society as well as to broadening of access to wealth for social justice, growth and development.

1.2 Knowledge systems

For the purposes of this paper, the authors would like to define an open knowledge system as a system comprised of organized structures and dynamic processes that bring together open content contributors for the specific purpose of strengthening the educational process. This knowledge system not only brings together the network of contributors, it also brings together those that use the content and builds on it and/or those that utilise the open content for the radical improvement of the educational process en route to poverty alleviation, social justice and other SDGs. Cash *et al* (2003) states that a knowledge system brings together data and information from various arenas to help decision makers gain a better understanding of the sustainability implications of their decisions more holistically. Cash *et al* (2003) also posit that a knowledge system provides an international forum for researchers and educators to share their knowledge and expertise to advance all associated topics related to the knowledge system.

In the 21st century, there is a need for new perspectives, tools and approaches to use resources strategically to grow a ‘repository’ of open content for the growth and development of the global south: for the alleviation of poverty and for the advancement of social justice. With regard to the linkage of knowledge systems to quality education, Potent (2014) asserts that a knowledge system approach needs to be applied to the process of learning and to the creation of new knowledge. Such knowledge systems are built on collaboration and participatory learning and that includes structures that are critical in addressing the complex challenge of a poor, under resourced educational systems. Knowledge systems must be used to grow capacity through the utilization of multiple sources associated with the openness movement and that would include open scholarly content, open source systems and OERs. At the core of such a knowledge system is a moderating operation which gently intervenes to ensure that the content generated and shared meets standards and salient to specific educational needs, while embracing the contributions of technology (open source) and collaborators.

To achieve workable outcomes, knowledge systems must be effective in facilitating communication, translation and mediation of the information, perspectives, insights and ideas that are drawn from all stakeholders. Valuable shared educational resources are the expected outcome of this networking of contributors. Knowledge systems, by bringing forth this collective capacity, provide a practical vehicle for growing a collection or repository of resources for strengthening basic to tertiary education in the global south.

The authors hold the view that, for all intents and purposes, a knowledge system is an ecosystem bringing together contributors and technology for a specific action. The openness system is viewed as a knowledge system as it brings together open source systems/software and contributors for the action of the enrichment of education. Then there is a larger knowledge system that links education (that is, the educators, the learner and the content) to other development strands such as health with the action of developing an egalitarian society underpinned by social justice. Then there is the more optimistic development ecosystem, that is, the interaction of quality education with other SDGs. In this development ecosystem, a number of sub-ecosystems merge for a better society. The authors propose that an educated citizen will find a job, contribute to the economy of the country, contribute to the growth of a democracy, contribute to the fiscal effectiveness of the country which in turn will assist in growing national budgets for education. A growing national budget for education will

improve conditions in basic education, providing a stronger base for graduation to tertiary education. With sound tertiary education, innovation and change becomes a reality and growth and development becomes a significant product of the contribution of this initial knowledge system. A sound educational system is the lifeline to sustainable development.

1.3 Sustainable Development

There is a common understanding about what sustainable development is with most of the literature defining it as “development that meets the needs of the present while safeguarding Earth’s life-support system, on which the welfare of current and future generations depends” (Griggs et al., 2013:306). It has at its core development that looks to balance different, and often competing, needs against an awareness of the environmental, social and economic limitations society confronts. It is crucial that these needs are harmonised as they are interconnected and are all crucial for the well-being of individuals and societies. All too often, development is driven by one particular need, without fully considering the wider or future impacts. The world is currently grappling with the damage this kind of approach causes.

Besides the careful stewardship of natural resources, sustainable development promotes the eradication of poverty and extreme income and wealth inequalities, the goal of full employment, the provision of access to quality and affordable basic services to all, and the fostering of a stable, safe, and just society. Sustainable development is driven by the goal for an improvement of lifestyle and well-being. The authors hold the view that at the centre of this improvement of lifestyle is the SDG ‘quality education’. They go on to assert that ‘quality education’ is the cornerstone for development.

The major objective of development is the satisfaction of human needs and aspirations. The essential needs of vast numbers of people in developing countries are for food, clothing, shelter, jobs and these are not being met. These people live in a state of economic and social poverty and legitimate aspirations for an improved quality of life. A world in which poverty and inequity are endemic will always be prone to other crises, many of which are linked to SDGs. Sustainable development requires meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life.

As is argued by the United Nations (n.d.), growth must be revived in developing countries because this is where the links between economic growth, alleviation of poverty, and environmental conditions converge. Therefore, it is not unexpected for the UN in 2015, to adopt the 17 Sustainable Development Goals (SDG). One of the SDGs is ‘quality education’ whose aim is to “ensure inclusive and quality education for all and promote lifelong learning” (UN, 2015). UNESCO (2017) maintains that universal access to quality education is key to sustainable social and economic development. As indicated earlier (and the main thrust of this paper), the openness movement is one of many knowledge systems that connect and interconnect to address the SDGs. One of the segments of the openness movement is OERs and this segment can be strategically used to improve the quality of education (UNESCO: 2017). Various stakeholders that advance the open sharing philosophy encourage communities to make use of any available tools to promote access to resources that contribute to educational development. The issue of education being a driver for economic development and ultimately poverty alleviation is recognised by the United Nations (n.d.) which states that “economic developments can accelerate social development by providing opportunities for underprivileged groups or by spreading education more rapidly”.

1.4 The three pillars of open scholarship

The third issue of discussion is that of openness. Open access is misinterpreted as the overarching concept covering all that is open - is taken to be synonymous with open scholarship or openness. The concept of 'openness' is much broader than open access. The openness movement or the open scholarship movement has three significant pillars of which one is open access and the other two are open source and open educational resources ((Raju, 2016: 3). However, the interdependent relationship fuels the misinterpretation. Nonetheless, the interdependent relationship between Open Source Software (OSS), OA and OER is critical for the growth of open scholarship.

The forerunner in the trilogy is open source which gained momentum using communities of practice and crowd sourcing as its golden threads. Open source refers to the creation of software in which the source code is available, free of charge, to the general public for use and/or modification from its original design. Open source code is typically created as a collaborative effort in which programmers improve upon the code and share the changes within the community. Open source was developed in the technology community as a counter to proprietary software owned by corporations.

The open source software community has provided the necessary impetus for the rapid growth of the OA and OER movements. Examples of OSS that have significantly influenced the OA and OER movements include, amongst others, DSpace, Open Journal Systems and Open Monograph Press. The growth of the OSS community has provided the OA and OER communities with software alternatives and options in terms of functionality.

Open access refers to free access to scholarly information for the end user. The OA movement originated as a direct response to the subscription crisis, that is, the exponential increase in the cost of journal subscriptions on the back of decreasing library acquisition budgets (Frank, 2013: 788). The *founding philosophy of the movement* was the sharing of scholarly literature for the furtherance of research. It is accepted that the primary purpose of dissemination of research is for the generation on new knowledge. The origins of OA were underpinned by a philanthropic philosophy, that is, sharing of research output for the benefit of society and the research community. However, the issue of improved visibility of research output began to gain prominence and began to overshadow the original philanthropic purpose. Publishers, recognizing the visibility imperative, constructed a new business model through article processing charges which met the demand for improved visibility.

The third segment in the trilogy is open educational resources. Open Educational Resources are teaching and learning materials that are in the public domain or have been released under an intellectual property license. OERs, by its very nature, means that anyone can legally and freely copy, use, adapt and re-share them, usually acknowledging the original content creator. The *founding philosophy of the OER movement* was the improvement of the quality of education and the strengthening of the educational system, especially in the developing world.

1.5 Open access within a social justice paradigm

The authors propose that social justice be viewed as the founding pillar of open access. This hypothesis draws from the definition which suggests that social justice be viewed as a system that confronts structures that perpetuate poverty and injustice. Given that the OA movement's primary mission and actual practice is to confront information poverty and injustice, then it can be inferred that social justice is an underpinning pillar of OA. This thesis is supported by Singh (2014) who submits that social justice, at its most fundamental level, is grounded in the

belief that all people have the same status. Social justice is basically a praxis of inclusion in which society provides all individuals with equal opportunities. Further, it is usually conceptualized within the ambit of the redistribution of resources to improve the situation of the disadvantaged.

There is further evidence in support of the thesis as van Deventer, van der Westhuizen and Potgieter (2015) add that social justice is a lived concept that encompasses acts of fairness, equality and justness towards others. They go on to point out that social justice is also relevant to those who are perceived to be privileged. Both the under-privileged and the privileged ought to share in the promise of fundamental human rights and the resultant praxis of justice as fair, equitable and equal. Therefore, irrespective of whether one is privileged or under-privileged, as soon as information poverty presents itself, it has to be eradicated and one of the proposed mediums is open access en route to ensuring that there is social justice – any form of discrimination is eradicated.

The toll on scholarly output, in the current ‘distribution of publication’ system, restricts those who cannot afford to pay for access research output marginalising them from the learning process. Further, limited access to scholarly content negatively impacts on research production as information is necessary for the generation of new information. This toll system fuels exclusionary tendency of the academy and promotes elitism. The ultimate effect of the toll is the systematic exclusion of the ‘poor’ from accessing and contributing to the research being done in a particular field. The knock on effect of this exclusionary practise relegates the global south to the furthest point in the world’s knowledge production chain. As much as the authors concede that information poverty may afflict the privileged, it is, in the main, the communities from the global south that are strangled by it (Tafari 2014).

As indicated by Lara-Alecio (2016) and fully supported by the authors, open-access publishing, be it in repositories or directly in open access journals, aids in pushing the envelope for social justice. It provides a more level playing field for all in terms of (a) delivering and obtaining knowledge, (b) understanding up-to-date scientific information, (c) increasing upward mobility and employability, and (d) ensuring greater societal gain.

1.6 Open Educational Resources

As indicated earlier, this paper discusses in slightly more depth the issue of OERs and reiterates its linkage to knowledge systems for sustainable development. Substantiating this linkage is the assertion by Umar, Kodhandaraman and Kanwar (2013) that OER “is an empowerment process, driven by technology in which various types of stakeholders are able to interact, collaborate, create and use materials and processes, that are freely available, for enhancing access, reducing costs and improving the quality of education at all levels”. Butcher (2015) adds that OER has potential to build capacity by providing access to institutions and educators, at low or no cost, to the means of production to develop their competence in producing educational materials and carrying out the necessary instructional design to integrate such materials into high quality programmes of learning.

UNESCO (2012) advocates that universal access to high quality education is key to the building of peace, sustainable social and economic development, and intercultural dialogue. Open Educational Resources (OER) provide a strategic opportunity to improve the quality of education as well as facilitate policy dialogue, knowledge sharing and capacity building (UNESCO, 2017). These resources include teaching, learning or research materials that are in the public domain or released with an intellectual property license that allows for free use,

adaptation, and distribution (UNESCO, 2017). Any type of educational material in the public domain or released under an intellectual property license that permits free use and re-purposing by others can be classified as an OER (UNESCO, 2017). Identified examples of OERs include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge. The nature of these open materials means that anyone can legally and freely copy, use, adapt and re-share these resources.

Thakrar, Zinn and Wolfenden (2009) observe that many of the developing economies of Africa are struggling to meet the need for more and better teachers to address the demands of increased access and success in the schooling system. Hence the need to reinforce that element of the network, that needs to be supported for the strengthening of education in the global south.

As much as the focus has been on OERs to support basic, secondary and tertiary education, Ng'ambi and Luo (2013) point out that OER project is also used to advance health education in Africa by creating and promoting free, openly licensed teaching materials created by African academics to share knowledge, address curriculum gaps, and support health education communities. This need addresses the SDG relating to good health: this reiterates the fact that OERs can be part of another knowledge system to address other SDGs

Much has been written and studied about the impact that OER has made on the education systems in the developing countries (Umar, Kodhandaraman and Kanwar, 2013). However, the reality is that OER, as a movement, has not made any dramatic transformation of the educational provision in most resource-poor nations in the developing world. One of the primary reasons for the lack of success is the ignorance of the fact that in developing countries, there has been a tendency to overlook the socio-cultural contexts in which institutions operate and the centralised, closed organisational structures and systems that characterise them.

Other factors that have contributed to this lack of success are:

- Inability of the legacy systems to absorb changes, that is, developing nations are still challenged by their inability to set themselves free from the legacy systems that conditioned their approach to educational development; and many of them simply do not have the resources to venture into this area of educational reform and transformation.
- Another factor is the strangulation by poverty and poor quality of working conditions of teachers. This strangulation has inhibited innovation and motivation.
- Environmental constraints like state control of education, cultural incompatibility, absence of accountability within the system, inflexible academic structures and pedagogical practices; inefficient governance and administrative processes and socio-political and cultural constraints do certainly impact negatively on experimentation and innovation.

1.7 Conclusion

It is common knowledge that the world has failed to meet the Millennium Development Goal of achieving universal primary education by 2015 (MDG Monitor, 2017). Sustainable Development Goals were 'designed' to address the goals not met by the MDGs and the challenges of quality and equity. The aims of the SDGs are to promote harmony among human beings and between humanity and nature. It is proposed that quality education

provides children with basic cognitive and language skills and fosters emotional development while tertiary education breeds innovation and change. The SDG quality education, within the openness knowledge system and other knowledge systems, is argued as the stimulus for economic emancipation and social inclusion.

Open source systems present unique opportunities for collaborative creation and dissemination of scholarly content through open knowledge systems. The growth of the openness movement, although its societal transformation is not yet pronounced, still provides strategic opportunities for sustainable development through educating collaborators on the benefits of the philanthropic philosophy to the global community. The willingness of the collaborators to share motivates others to open license scholarly content and contribute towards economic and social exclusion, mostly for their local communities, which also benefits anyone with access to networked information technologies. Open Educational Resources (OERs) are open scholarly products, which are important learning materials with the potential to facilitate the expansion of learning worldwide. The flexibility, both technological and legal, afforded by openly licensed content is an important precondition for supporting the educational use of content. With libraries engaging in library publishing the collaborators engaging through openness knowledge systems will further develop useful resources for the emancipation of the marginalised communities.

OERs have not yet gained the traction necessary for it to have the desired impact. And given the challenge of resources in the global south, it is necessary that impetus and attention be given to OERs as an important intervention that could deliver on quality education which is a strategic goal of SDG 4.

References

- Ahmed, A. 2007. Open access towards bridging the digital divide—policies and strategies for developing countries. *Information Technology for Development*, 13(4): 337-361. DOI: 10.1002/itdj.20067.
- Breidlid, A. 2009. Culture, indigenous knowledge systems and sustainable development: A critical view of education in an African context. *International journal of educational development*, 29: 140-148.
- Butcher, N. 2015. A basic guide to open educational resources. Common Wealth of Learning: British Columbia, Canada 2015. Available at <http://unesdoc.unesco.org/images/0021/002158/215804e.pdf> [2017, April 23].
- Cash, D., Clark, W., Alcock, F., Dickson, N., Eckley, N. Guston, D., Ja'ger, J. and Mitchell. R.2003. Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences*, 100(14). Available: <http://www.pnas.org/content/100/14/8086.full>. [2017, April 20].
- Frank, M. 2013. Open but not free-publishing in the 21st century. *New England Journal of Medicine*. 368(9): 787-789. DOI: 10.1056/NEJMp1211259.
- Griggs, D., Stafford-Smith, M., Gaffney, O., Rockström, J., Öhman, M.C. Shyamsundar, P., Steffen, W., Glaser, G., Kanie, N, & Noble, I. 2013. Sustainable development goals for people and planet. *Nature*, 495: 305-307.
- Lara-Alecio, R., 2016. Reflections regarding open-access journals and social justice, *Journal of childhood and developmental disorders*, 2: 1-2.

- MDG Monitor. 2017. *MDG 2: Achieve universal primary education*. Available: <http://www.mdgmonitor.org/mdg-2-achieve-universal-primary-education/> [2017, June 22].
- Ng'ambi, D. and Luo, A. 2013. Towards a sustainable inter-institutional collaborative framework for open educational resources (OER). In McGreal, R., Kinuthia, W. and Marshall, S, Eds. *Open Educational Resources: Innovation, Research and Practice*. Commonwealth of Learning: British Columbia, Canada.
- Potent, J. 2014. *Employing a knowledge systems approach to creating a sustainable future*. Available: <http://blogs.ei.columbia.edu/2014/02/21/employing-a-knowledge-systems-approach-to-creating-a-sustainable-future/> [2017, April 24].
- Raju, R. 2016. Not a knee-jerk reaction: openness - a UX imperative. Paper presented at: IFLA WLIC 2016 – Columbus, OH – Connections. Collaboration. Community in Session 136 - Social Science Libraries with Asia and Oceania. Available at: <http://library.ifla.org/1355/> [2016, September 15].
- Singh, V., 2014. Open source software use in libraries: implications for social justice?, *Qualitative and quantitative methods in libraries (QQML)*, Special Issue on Social Justice, Social Inclusion, (2014): 49-57.
- Tafari, N. 2014. Prices of U.S. and Foreign Published Materials 2015. *Association for library collections and technical services*, (2014): 424-459. Available: <http://dx.doi.org/10.19173/irrodl.v10i4.705> [2017, April 20].
- Thakrar, J. Zinn, D and Wolfenden, F. 2009. Harnessing Open Educational Resources to the Challenges of Teacher Education in Sub-Saharan Africa. *International review of research in open and distance learning*, 10(4). Available: <http://dx.doi.org/10.19173/irrodl.v10i4.705> [2017, May 15].
- Umar, A., Kodhandaraman, B. and Kanwar, A. 2013. Can open educational resources thrive in closed educational systems? Some reflections on OER in developing countries. In McGreal, R., Kinuthia, W. and Marshall, S, Eds. *Open Educational Resources: Innovation, Research and Practice*. Commonwealth of Learning: British Columbia, Canada.
- UNESCO. 2012. *Open Educational Resources*. World Open Educational Resources Congress. Available: <http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-educational-resources/> [2017, April 20].
- UNESCO. 2017. *Open Educational Resources*. 2nd World Open Educational Resources Congress. Available: <http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-educational-resources/> [2017, April 20].
- United Nations [n.d.]. Gathering a body of global agreements gathering a body of global agreements: our common future, chapter 2: towards sustainable development. Available at <http://www.un-documents.net/ocf-02.htm> [2017, April 20].
- United Nations. 2015. Sustainable development Goals. Available: <http://www.un.org/sustainabledevelopment/> [2017, April 20].
- United Nations. 2015. Transforming our world: the 2030 Agenda for Sustainable Development. Available: <https://sustainabledevelopment.un.org/post2015/transformingourworld/publication> [2017, April 20].
- Van Deventer, I., Van der Westhuizen, P. and Potgieter, F. (2015). Social justice praxis in education: towards sustainable management strategies. *South African journal of education*, 35 (2015). DOI: 10.15700/saje.v35n2a956.