African Health
OER Network

OER and Health Education: the Potential of Openly Licensed Digital Content

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Introduction

Globally, the inadequate density and distribution of healthcare providers negatively affects health outcomes. In Sub-Saharan Africa, particularly, there is a shortage of healthcare professionals due to insufficient training and brain drain. Despite strong gains in expansion of access to tertiary education, Africa significantly lags behind other developing regions in producing higher education graduates.[i] Ghana, for example, is among countries with the lowest healthcare worker density, but with high overall mortality. In response, the country has the goal of tripling the number of healthcare providers. However, the country can only admit 30% of its qualified applicants to medical school, as it cannot increase the faculty size.[ii] In this context, retention of trained healthcare professionals is essential in order to provide for future faculty members, who themselves are more likely to stay in the country if advanced training programs are available to them.[iii] The reality is, however, that approximately half of the physicians who have graduated from medical school in Ghana have left the country, with the lack of opportunity for post-graduate training being one of the factors.[iv] This situation is similar in many other African countries.

Against this background, Open Educational Resources (OER), have the potential to expand access to health education, and consequently, increase the number of healthcare professionals joining the workforce. This is because OER can:

- Increase the availability of high quality, relevant and need-targeted learning materials that can be openly shared;
- Eliminate duplication by using and adapting materials that are already available, saving lecturer time that can be invested elsewhere to improve education outcomes;
- Reduce the cost of accessing educational materials;
- Support opportunities for distance and continuing education through provision of multimedia rich learning materials to enrich learning; and
- Foster collaborative partnerships of healthcare professionals working in communities of practice, across and within institutions, in the creation, sharing, and use of teaching and learning resources.

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Development, use and sharing of OER is a growing phenomenon in higher education, specifically in health education, where several institutions have firmly established themselves, or are emerging in the development, use and open sharing of content. To cite a few examples, the Massachusetts Institute of Technology (MIT), through their division of Health Sciences and Technology (see http://ocw.mit.edu/courses/health-sciences-and-technology/#undergrad), openly shares lecture notes, images, online textbooks, and multimedia content on genomics and computational biology, pharmacology, and physiology, among others. Johns Hopkins Bloomberg School of Public Health (see http://ocw.jhsph.edu/?select=www), provides open access to the School's most popular courses, including mental health, nutrition, infectious diseases, genetics, and biostatistics. The Kwame Nkrumah University of Science and Technology (KNUST), has developed open content in basic sciences and laboratory medicine, pharmacy, behavioural sciences, internal medicine, and obstetrics and gynaecology (see http://web.knust.edu.gh/oer/).

Besides institutional content, there are multiple initiatives driving health content repositories, for example MedEdPortal (see https://www.mededportal.org/browse/), an open education resource and publication service provided by the Association of American Medical Colleges (AAMC) in partnership with the American Dental Education Association. MedEdPortal has a content repository offering free access to peer-reviewed health professional teaching and assessment tools such as tutorials, virtual patients, simulation cases, lab guides, videos, and podcasts. This content is being utilised by over 10,000 health education institutions in 192 countries.[v] In Africa, OER Africa is building a database which links to health education repositories (see http://www.oerafrica.org/healthoer/HealthOERHome/HealthOERRepositories/tabid/892/Default.aspx). These are just a few examples of the kinds of developments emerging rapidly in the OER field.

What are Open Educational Resources?

OER are educational resources that are openly available for use by educators and students, without an accompanying need to pay royalties or licence fees. Different options are emerging that can be used to define how OER are licensed for use (and adaptation as appropriate), some of which simply allow copying and others that make provision for users to adapt the resources that they use. The best known of these are the Creative Commons licences (see www.creativecommons.org), which provide legal mechanisms to ensure that people can retain acknowledgement for their work while allowing it to be shared, and can choose to restrict commercial activity if they so wish, or prevent people from adapting work if appropriate (although this may be legally difficult to enforce).

OER is not synonymous with online learning or e-learning. Many open resources being produced currently –while shareable in a digital format – are also printable. Given the bandwidth and connectivity challenges common in many African countries, it would be expected that a high percentage of resources relevant to higher education in such countries are shared as printable resources, or as removable media, e.g. CD – ROM, rather than being designed solely for use in e-learning.

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Midwifery students at Kamuzu College of Nursing show off OER course materials on CD-ROM[vi]

The OER value proposition

The emergence of open licences has occurred in an effort to protect an author's rights in environments where content (particularly when digitized) can so easily be copied and shared on the Internet without asking permission. Digitization of information in all media, combined with its increasingly widespread access, has introduced significant challenges regarding how to deal with issues of intellectual property such as copyright. The ability for anyone to copy and share content once it has been digitized creates both opportunities and challenges for higher education providers. The main challenges relate to the ease with which digitized content can be copied and shared, with or without the permission of the copyright holder. Thus, open licences seek to ensure that this copying and sharing happens within a structured legal framework that is more flexible than the automatic all-rights reserved status of copyright.

Many proponents of OER consider that a key benefit of open content is that it is 'free' (i.e. it does not cost anything to download – leaving aside costs of bandwidth). This is literally true for the end-user: by definition, open content can be shared with others without asking permission and without paying licence fees. However, there are some important cost considerations to be taken into account.

Effective harnessing of OER first requires that institutions invest systematically in programme, course, and materials development/acquisition. Costs will include wages for the time of people in developing curricula and materials, adapting existing OER, dealing with copyright licensing (if material is not openly licensed), and so on. It also includes associated costs such as ICT infrastructure (for authoring and content-sharing purposes), bandwidth expenses, and costs of running workshops and meetings when content development teams meet.

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All educational institutions need to be making these investments on an ongoing basis for the improvement of quality of teaching and learning. The most cost-effective way to invest in materials design and development is to incorporate effective adaptation and use of OER, because it eliminates unnecessary duplication of effort by building on what already exists elsewhere, takes advantage of pooled alternative resources to meet accessibility obligations, removes costs of copyright negotiation and clearance, and – over time – can engage open communities of practice in ongoing quality improvement and quality assurance.

The transformative educational potential of OER revolves around three linked possibilities:

1) Increased availability of high quality, relevant learning materials can contribute to more productive students and teaching staff. Because OER removes restrictions around copying and adapting/contextualizing resources, it can reduce the cost of accessing educational materials. It removes the need for royalty payments for text books and other educational materials and the time-consuming processes of procuring permission to use copyrighted material. Even where teaching staff produce new materials, their ability to draw inspiration and ideas from other people's openly accessible teaching materials can serve to increase quality without adding cost.

2) The principle of allowing adaptation of materials provides one mechanism amongst many for constructing roles for students as active participants in educational processes, who learn best by doing and creating, not by passively reading and absorbing. Open licences that encourage activity and creation by students through re-use and adaptation of content can make a significant contribution to creating more effective learning environments. This freedom to modify also provides an unprecedented opportunity to adapt curriculum to a far greater diversity of learners who would otherwise face barriers to learning due to language, cultural conventions, or disabilities.

3) OER have potential to build capacity by providing institutions and teaching staff access, at relatively low cost, to the means to create high quality teaching and learning materials. This can be harnessed to develop competence in producing such materials and carrying out the necessary instructional design to integrate such materials into high quality programmes of learning. Increasingly, while teaching staff are expected to have the knowledge and skills to teach in a broad spectrum of subjects, they often lack the time to re-visit and modify curriculum and educational materials on a regular and systematic basis.

Thus, the transparency provided by OER (where resources produced by staff are shared openly) places social pressure on institutions and teaching staff to increase quality, allows them to better coordinate curricula, and provides resources for students' learning and for academic planning. Openly licensed educational materials have tremendous potential to contribute to improving the quality, accessibility, and effectiveness of education, while serving to restore a core function of education: sharing knowledge.

Higher education faces challenges of growing enrolment with limited increases in resources, and there is an ongoing rollout of ICT infrastructure into institutions. As such, it is becoming increasingly important for educational institutions to support, in a planned and deliberate manner, the development and improvement of curricula, ongoing programme and course design, planning of contact sessions with students, meeting the needs of a greater diversity of students, development of

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quality teaching and learning materials, and design of effective assessment. All of these activities aim to improve the teaching and learning environment while managing cost through increased use of resource-based learning. OER manages this investment and the resulting copyright issues in a way that creates significant opportunities for supporting ongoing improvements in the teaching and learning process.

Some institutions that share content freely have indeed gained commercially, as students who have enrolled with them were influenced to do so because of exposure to the institution's materials. Research suggests, for example, that this has been the case with MIT, where a 2006 study found that 35% of MIT freshmen knew about MIT course materials and had been influenced to study with the institution because of free access to these resources, and that half of MIT alumni have logged onto the MIT open courseware site to download and use materials.[vii]

Publishers have long been considered custodians of quality assurance of all published educational materials. Consequently, there is often suspicion towards any materials released as OER, due to anxiety about its quality. This is based on the assumption that, if a 'reputable' publisher has not endorsed content, it is poor quality. However, transparency can be a driver of quality. If academics are concerned about 'public' perceptions of quality, openly sharing their materials will result in improving the quality of the teaching materials they produce. Responsibility for quality should be a high priority within an institution, among course coordinators and lecturers. The skills they have in evaluating and selecting quality educational resources should be used to produce similar materials for sharing, as well as selecting openly available materials that they can use or adapt for re-use.

General benefits of sharing content

The following benefits can accrue from sharing content under an open licence:

- As digitized content can so easily be shared between students and institutions, sharing it publicly under an open licence is the safest way to protect the author's Intellectual Property Rights (IPR) and copyright; the licence can ensure that, when content is shared, it remains attributed to the original author. Open sharing of content can more rapidly expose plagiarism, by making the original materials easy to access. In addition, releasing materials under an open licence also reduces the incentive for others to lie about the source of materials because they have permission to use them.
- Sharing of materials provides institutions opportunities to market their services. Educational institutions that succeed economically in an environment where content has been digitized and is increasingly easy to access online are likely to do so because they understand that their real potential educational value lies not in content itself, but in offering related services valued by their students. These might include: guiding students effectively through educational resources (via well-designed teaching and learning pathways); offering effective student support (such as practical sessions, tutorials, individual counselling sessions or online); and providing intelligent assessment and critical feedback to students on their performance (ultimately leading to some form of accreditation). Within this environment, the more other institutions make use of their materials, the more this will serve to market the originating institution's services and thereby attract new students.

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- For individual educators, proper commercial incentives for sharing content openly are most likely to flow when institutions have policies to reward such activity properly. Up to now, many institutional and national policies and budgetary frameworks have tended, at worst, to penalize collaboration and open sharing of knowledge (by removing possible streams of income when knowledge is shared openly) or, at best, to ignore it (as so many universities do by rewarding research publication over other pursuits). Thus, for most educators, the incentives lie in changing the institutional and national policies and budgetary frameworks so that they reward collaboration and open sharing of knowledge.
- Even if institutional and national policies and budgetary frameworks do not reward collaboration and open sharing of knowledge, there are still incentives for educators to share their resources openly. Open licences maximize the likelihood of content-sharing taking place in a transparent way that protects the moral rights of content authors. Furthermore, people who seek to ring-fence, protect, and hide their educational content and research will likely place limits on their educational careers. They will also increasingly be excluded from opportunities to improve their teaching practice and domain-specific knowledge by sharing and collaborating with growing networks of educators around the world. Those who share materials openly already have significant opportunities to build their individual reputations through these online vehicles (although, of course, the extent to which they manage this will remain dependent on the quality of what they are sharing).

The value of OER in health education

High quality materials can augment learning, and improve learning outcomes, especially in contexts facing teaching and learning challenges like large classes. This is particularly pertinent in health education in Africa, where clinical training, an essential component of health education, requires students to participate in laboratory sessions and ward rounds, often overcrowded to the extent that this may affect students' understanding of intended learning objectives and procedures. In this regard, OER that are multimedia enriched can be used to demonstrate clinical procedures, and these can be distributed online for access by students, or through CD-ROM, where students can review them before and after laboratory sessions and ward rounds to enhance their understanding.[viii]

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Crowded Ward Rounds at Komfo Anokye Teaching Hospital[ix]

There is a wealth of high quality and relevant health education materials available as OER, which can be used to meet the educational needs of students in Africa. However, because most of these materials are developed overseas, they are not always contextually relevant. For example, there are a limited number of materials that explain diseases that occur predominantly in Africa, such as *Buruli* Ulcer. Additionally, the manifestation of certain diseases, particularly skin diseases, is different on patients with a light or a darker skin tone. With OER, African healthcare professionals can adapt existing materials or develop new ones to include contextually relevant images and examples that showcase specialized knowledge in African diseases. [x]

As institutions expand their degree offerings, to accommodate new groups of students, for example students with a medical degree who need professional support, or nursing students who need bridging courses to study for a degree, new teaching and learning resources will be required for such new courses. Depending on the nature of the programmes, there may be no readily available textbooks or learning materials for them. Lecturers would need to explore new courses, and they may opt to develop their own course materials, which they can share openly for the benefit of other institutions in the region who also want to teach similar courses. Such course development efforts could be across institutions or regions, creating opportunities for standardized regional courses. Collaboration and licensing courses as OER will significantly reduce the cost of programme development.[xi]

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The African Health OER Network – a starting point for nurturing a culture of open sharing

Established in 2008, OER Africa is an initiative of the South African Institute for Distance Education (Saide), aimed at supporting the development and use of OER in all educational sectors on the African continent. Among the several OER projects it supports, OER Africa has a dedicated health project, the African Health OER Network, which aims to advance healthcare education in Africa by using OER to share knowledge, address curriculum gaps, and support communities around health education. OER Africa co-facilitates the African Health OER Network with the University of Michigan (U-M), which has a strong tradition of leadership in health science education, having established the first school of scientific medicine on the western frontier in 1850.

The African Health OER Network fosters co-creation of resources, enabling institutions to share knowledge, address curriculum gaps, and use OER for improving the delivery of health education in Africa. The Network is building the socio-technical infrastructure to draw in more African and, eventually, global participants, while also developing models of collaboration and sustainability that can be replicated in other regions of the world. The role of the Network is to:

- Aggregate the results of multiple health education initiatives by collecting, classifying, indexing, and then actively distributing African-initiated resources with the global health community;
- Facilitate discussion of how those resources can best be used;
- Share best practices, e.g., OER production and advocacy;
- Aggregate content to develop and deliver a critical mass of learning materials; and
- Work through institutions and associations to advocate the principles of openness and of sharing educational materials. This includes helping institutions to create an enabling policy environment for OER production and use.

The African Health OER Network (http://www.oerafrica.org/healthoer/) has over 150 original African-produced OER, an OER request facility, a declaration of support for members to sign, and a quarterly newsletter. Network members have created and shared 150 new OER representing diverse health disciplines and media types. Users can specifically make a request for resources or help other requestors get resources that they are looking for, through the request facility.[xii] Resources available from academics in Africa include those on medicine, nursing, pharmacology, ethics, and public and community health. The African Health OER Network has also compiled quite an extensive database of health OER repositories.[xiii]

Network members have a significant role to play towards building the Network. Member opportunities include contributing resources to the database of repositories, thereby expanding resources that can be accessed by the Network. Members can also direct the Network facilitators to good sources of OER that they have used, so that these can be sourced and added to the database.

As custodians of health education in Africa, members of the Network will play a crucial role in quality assuring OER that are developed in Network member institutions. This way, the quality of health OER produced in Africa, through the network, will be of a very high standard, and capable of high quality education provision to Africa's future healthcare professionals. In the development of resources, there is potential for development of common curricula for postgraduate courses in

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health that will harness expertise across institutions to enable cost effective harmonized materials development to cater for mobility of healthcare workers within the region.

The Network provides an outlet where healthcare practitioners can share updates on health related matters and development in Africa. This can be done through sharing information on forums, circulating information about important conferences, and calls for publications and meetings taking place within the region. Information on developments can also be shared through the quarterly African Health OER Network newsletter.

How to get involved in the African Health OER Network

Participation in the network is open and there are no conditions. However, it is useful for Network participants to demonstrate a commitment towards open education and OER Africa, by signing the declaration.[xiv] To receive communication on the African Health OER Network, including the quarterly newsletter, you can subscribe to the Health OER Network mailing list. If you would like to learn more about Health OER and how your institution can get involved in Health OER initiatives or the Network, contact healthoer@oerafrica.org.

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