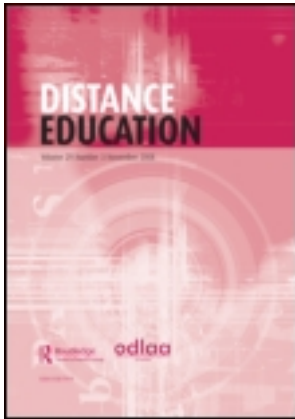


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### Insights from the Health OER Inter-Institutional Project

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## Insights from the Health OER Inter-Institutional Project

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Open educational resources (OER) are gaining ascendancy in education, particularly in higher education. Logic suggests that the potential benefits of OER are likely to be greatest in resource-poor contexts such as Africa. However, little is known about the feasibility and sustainability of their use in African institutions. In the Health OER Inter-Institutional Project, OER Africa and the University of Michigan collaborated with medical schools in Ghana and South Africa to help develop OER and tools for facilitating the integration of these into the existing curricula. The article draws upon data from the various evaluations of this project as a basis for generating understandings on initiating and sustaining OER in African contexts.

**Keywords:** open educational resources; African OER; Health OER; health sciences; sustainability; cultural and social capital

### Introduction

Sub-Saharan Africa has declined vis-à-vis all other areas of the world in trade investment, production, and consumption (Castells, 2000). The effect of this on education is marked, with a 30% decline in public expenditure per student over the last 15 years (Experton & Fevre, 2010, p. 2). This has resulted in a decline in the quality of teaching and research at university level due to growing enrolments amidst limited funding, and massive brain drain of talented professors (Holm & Maleté, 2010, p. 14). The gross enrolment ratio (GER) in tertiary education is a low 3% (UNESCO, 2010).

Health services are also not immune to these circumstances. According to the World Health Report (World Health Organization, 2010), 19 African countries allocate less now than they did in 2001 when their heads of state signed the *Abuja Declaration* to spend 15% of their national budgets on health. The report notes that up to 70% of medical equipment in sub-Saharan Africa stands idle as a consequence of ‘a lack of user training and effective technical support’ (World Health Organization, 2010, p. 66).

These circumstances indicate that the potential benefits of open educational resources (OER) could be great in Africa. But given the paucity of research on African higher education, the low levels of technology penetration, and the lack of infrastructure and requisite skills (Butcher, 2003, n.d.), little is known about the feasibility and sustainability of the use of OER and how they might help in health education.

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### OER use: the new approach in Africa

Since being used for the first time at a 2002 UNESCO conference (Hylén, 2006), the term OER has become part of the everyday discourse of teaching and learning. Best understood as ‘educational resources that are freely available for use by educators and learners, without an accompanying need to pay royalties or license fees’ (OER Africa, n.d.a), OER and the movement supporting them have quickly gained acceptance. International organizations such as the Organisation for Economic Co-operation and Development (OECD, n.d.) and UNESCO (1995–2011, 2011) promote OER because of their potential to contribute to social equity by providing broader access to quality education. Major funders of OER projects include the Hewlett Foundation (<http://www.hewlett.org/programs/education-program/open-educational-resources>) and the South African Shuttleworth Foundation (<http://www.shuttleworthfoundation.org>). The Hewlett Foundation has funded, for example, the Massachusetts Institute of Technology’s Open Courseware initiative and Connexions at Rice University (<http://cnx.org/>), which claims to house one of the largest OER repositories in the world. In 2008, the Shuttleworth Foundation (n.d.a) convened a meeting in Cape Town to bring together the OER community. Participants at this meeting, who came from many nations, drafted the *Cape Town Open Education Declaration*, which urged governments and publishers to make publicly funded educational materials freely available via the Internet (<http://www.capetowndeclaration.org>). This declaration has been described as ‘utopian in its general outlook’ (Deacon & Wynsculley, 2009, unpaginated), but to date, more than 234 organizations and 2214 individuals have signed up to its principle (Shuttleworth Foundation, n.d.b), which represents a powerful symbolic legitimization of OER.

Governments in the developed world are showing interest in OER, particularly in the form of open textbooks. In California, for example, there is a public–private Open Source Textbook Project (COSTP, 2002). Support of OER is not simply an altruistic undertaking: it can be a money-saving decision.

The adoption of OER has a compelling logic. It is difficult to counter such arguments as ‘we can (and must) continuously improve the quality, effectiveness, appeal, cost and time efficiency of the learning experience’ (Anderson, 2009, p. 5). But the logic and affirmation of OER does not mean that organizations and academics will uncritically embrace their use to the extent that it becomes normative. Thus, notwithstanding the persuasive ideological, financial, and altruistic appeal of OER, questions of who is using OER, for what purpose, and to what effect are debated at conferences, in the literature, and online. Many such questions remain unanswered (Hylén, 2006). This is because the OER agenda is more complex than may appear at first glance. There are legal issues, such as intellectual property rights, financial implications, and academic concerns, and together they leave us with the question: Why should educational knowledge and products be given away free?

Even with licensing that provides flexible options for materials developers to retain copyright while allowing others to copy, distribute, and use their work, such as Creative Commons (<http://creativecommons.org/licenses>), there is a widespread fear that if course materials are placed online they will be stolen (Anderson, 2009). Such fears are not completely irrational, given that traditionally, organization and dissemination of knowledge was confined to special persons and transmitted in contexts where the owners of the knowledge exercised ‘the jealous eye of a threatened priesthood’ (Durkheim, 1961, p. 1). Openness can threaten academics’ sense of

knowledge structures, control, and continuity. Although OER is a ‘disruptive innovation,’ it has nevertheless secured a number of early adopters (Stacey, 2010, unpaginated). But the question that must be asked is: Does this apply in African contexts?

### The study

The study concerned a project initiated by OER Africa (<http://www.oerafrica.org>). OER Africa is an initiative of the South African Institute for Distance Education (SAIDE) (<http://www.saide.org.za>), funded by the Hewlett Foundation. Established in 1992, SAIDE seeks to employ innovative education methods in transforming education systems and redressing inequalities. It envisages OER having a powerful, positive role to play in African higher education (Welch, 2009). Ngugi (2009) observes:

The potential application of OER as a means to increasing access to quality, affordable and cost effective educational resources cannot be underestimated within a context where one of the major costs to African educational systems is that of acquiring pedagogically sound learning materials . . . Currently, most OER projects are undertaken in the developed world. Even those intended to benefit Africa. This often results in materials being developed by educationalists who do not necessarily have immediate insight into the context and challenges of educational delivery in Africa. (p. 1)

One of OER Africa’s foremost projects has been the Health OER Inter-Institutional Project (hereafter referred to as Health OER).

The project’s design phase ran from November 2008 to December 2009 and involved collaboration between the Health Science colleges and faculties in:

- University of Michigan (U-M), which provided the platform for collaboration
- Kwame Nkrumah University of Science and Technology (KNUST)
- University of Ghana (UG)
- University of Cape Town (UCT)
- University of the Western Cape (UWC). At UWC, the project is functioning separately in two different units, namely, the Faculty of Dentistry and the School of Public Health (hereafter referred to as UWC Dentistry and UWC SOPH).

Further, the Hewlett Foundation funding enabled a focus on the consolidation, growth, and sustainability of Health OER in 2010–11. The data on which this article is based were drawn from the two project evaluations:

- *Health OER Inter-Institutional Project: Formative Evaluation of Health OER Design Phase* (OER Africa, 2009).
- *Health OER Inter-Institutional Project: Phase 2 Evaluation: Consolidation and Sustainability* (OER Africa/ University of Michigan, 2011).

The purposes of these evaluation studies were threefold:

- (1) *To evaluate the initial design and implementation of Health OER in the institutions, and discover how the various activities and outputs related to the different institutional orientations.*

Higher education is not noted for rapid change, especially when this is radical. Institutions jealously guard their autonomy and there could be the ‘not invented here’ syndrome, so it was important to see not only how, but why, the institutions reacted to the introduction of this new approach to educational resources.

(2) *To ascertain the sustainability of Health OER.*

It was also necessary to track the development and use of African-produced OER through the phases of consolidation and extension that would hopefully lead to the treasured goal of sustainability.

(3) *To determine whether an OER culture was being developed.*

OECD (2007) observes that virtually every successful OER project involves collaboration between disparate individuals, a community that is energized and motivated to complete, publish, and support its work, and a critical mass of content that can be used as a base from which a specific community of practice can create an enhanced or customized version exactly suited to their specific needs. ‘The OER movement has its champions, some of whom promote it somewhat evangelically’ (OER Africa, 2009, p. 24). But the widespread adoption of Health OER required more than this. It called for a paradigm shift to a participatory and collaborative culture of learning.

### Initiating the OER project

Evaluation of the introduction of Health OER into the institutions was based on the activities and outputs detailed in Table 1.

These activities and outputs also needed to be examined in the institutional contexts predating the introduction of Health OER. At UG and KNUST, development of Health OER was a totally new undertaking. Development of policy to support OER had to be started from scratch, in tandem with the creation of the OER. By contrast, the academics in the Health Sciences and some other faculties at UCT had already, on their own initiative, begun producing web-based materials and courses long before the university’s signing up to the *Cape Town Open Education Declaration*. One academic had started making his materials freely available on his website in 1995, and at the time of introducing Health OER, one web-based occupational health course was already in its third cycle. Thus, the need here was not for a single consolidated drive to embed OER in institutional policy (Hodgkinson-Williams & Gray, 2009), but rather the formalization of on-the-ground developments to aggregate the existing initiatives.

UWC presented yet a third model: ‘In 2005 UWC’s Senate passed an ambitious *Free Content, Free/Open Courseware Policy*, which removed institutional

Table 1. Activities and outputs for evaluation of Health OER.

Activities	Outputs
Institutional policy engagement	Detailed policy strategies to facilitate OER activities
Health OER publishing projects	Published and implemented OER learning materials

obstacles to publication of open educational resources' (UWC, 2007–2008). The terms *ambitious* and *removed institutional obstacles* allude to its visionary OER policy. However, there was, and still is, no easily identifiable OER champion, and the capacity and resources to drive OER mainstreaming were, and remain, limited. At the time of the formative evaluation, staff familiar with the free content policy described it as having no impact on their work. One academic deemed it 'vacuous' (OER Africa, 2009, p. 10).

Of the two UWC units participating in the Health OER project, SOPH was already offering distance programmes to students Africa-wide. SOPH's predisposition to Health OER was evidenced in its contributing two of the nine resources on UWC's free courseware site by 2009. By contrast, OER were entirely new to UWC Dentistry, and the inherited culture of the faculty was not conducive to openness. There had been a merger of units from two different universities with very different institutional cultures and faculty reported that there were still strong departmental boundaries.

The key features of the participating institutions at the commencement of the Health OER project are given in Table 2. UG and KNUST are grouped together because of their essential similarities.

The formative evaluation concluded that meaningful and productive policy engagement had occurred (OER Africa, 2009, p. 13). In less than a year, the two Ghanaian institutions (UG and KNUST) had drafted the policies necessary to enable and support OER. The team managing OER Health played an unassertive but supportive role in commenting on these policy drafts, which were in the institutional approval process by the end of 2009. In the two other institutions, it was a question of building on what were the largely symbolic policies already in

Table 2. Key features of participating institutions at project commencement.

	UG and KNUST	UCT	UWC Dentistry	UWC SOPH
Prior orientation to OER	OER introduced as a new concept to the Health Sciences	Prominent individual academics were active e-learning/OER producers	OER introduced as a new concept to the faculty	SOPH had two resources available as OER prior to project
Development of OER policy	Started from scratch	Developing organically on basis of existing practices	No substantive institutional driving force to operationalize existing OER policy that was largely symbolic	
Development of OER resources	Started from scratch, in tandem with policy development	Diverse types of e-learning/OER materials developed by individuals prior to project	Started from scratch; OER creation disconnected from policy development	Strong background in materials development for distance education
Role of the Health OER Project	<i>Initiated</i> a new paradigm	<i>Complemented</i> existing initiatives and developments	<i>Initiated</i> a new paradigm	<i>Added</i> a new open licensing dimension to existing resource-based teaching



place by capitalizing on the past and current OER initiatives. In UWC, the OER Health Management team conducted a detailed review of the institutional policies regarding OER. At UCT, there were already champions who could promote the approach on the basis of enterprising OER production that was already in motion.

With respect to published and implemented OER materials, the expectations and contractual targets were either met or exceeded by an impressive margin. Sixteen original productions had been completed, with a further three scheduled for completion in January 2010. OER developed in Ghana (by UG and KNUST) and by UWC Dentistry were of the discrete learning-object genre; that is, they were based on a single learning objective. Making good use of the U-M copyright clearance process (dScribing), UCT and UWC SOPH had developed OER ranging from case studies to entire modules. Some of these resources were already in use internally and scheduled for public release after institutional approval, and many of these are now on the OER Africa website (<http://www.oerafrica.org/healthproject/HealthProjectHome/tabid/956/Default.aspx>).

It was clear that OER had appeal. Particularly notable was the progress in the Ghanaian institutions, despite their starting from scratch. At UG and KNUST, a visiting U-M professor who was an expert in educational materials production was driving the project. With the possible exception of UWC, the emergence of OER champions in respect of production and institutional policy-making was also creating momentum.

The two greatest threats to the project were workload in OER production and the quid pro quo principle. The OER creators were prepared to share their resources but expected to benefit from accessing the others' OER. Openness is a fine goal but raises questions about costs and mutual benefits, and at this stage, there was little evidence of OER being shared.

However, by the end of 2009, there was evidence that, with appropriate support, Health OER could gain a foothold in African higher education, even where the concept was previously unknown. However, questions needed to be asked about OER sustainability. Vollmer (2010) suggests that sustainability depends upon evidence that OER can develop from an interesting experiment to a demonstrated model that empowers teachers, boosts student achievement, and saves money in the process.

### How sustainable is OER Health?

The critical questions needing answering in terms of sustainability within the individual institutions and across the institutions are given in Table 3. In regard to the individual institutions, these questions were based upon Bourdieu's three states of cultural capital (1986, pp. 241–258):

- (1) the *embodied* state, where it is found in long-lasting dispositions of the mind and body
- (2) the *objectified* state, where it is found in cultural goods such as books
- (3) the *institutionalized* state, where it formalizes dispositions into codes and regulations.

Although all of these forms of capital are essential for sustainability *within* individual institutions, the full potential of adaptation, reuse, and creation of OER

Table 3. Critical questions regarding sustainability in Health OER.

Domain of sustainability	Analytic category	Indicators/empirical questions
Within individual institutions	Embodied cultural capital	<ul style="list-style-type: none"> <li>• Acceptability and relevance of OER?</li> <li>• Preparedness to create OER?</li> <li>• Is there a sufficient threshold of academics confident, competent, and active in OER production and use?</li> </ul>
	Objectified cultural capital	<ul style="list-style-type: none"> <li>• Is OER production doable and viable?</li> <li>• What has been produced?</li> <li>• Are productions original or adapted from existing sources?</li> <li>• Have OER produced in one participating institution been used in another?</li> </ul>
	Institutionalized cultural capital	<ul style="list-style-type: none"> <li>• Is institutional policy amenable to OER?</li> <li>• Is there alignment of relevant structures (e.g., ICT, library)?</li> <li>• Is there funding for OER? Are there support structures for OER production?</li> </ul>
Across individual institutions: the broader social level	Social capital	<ul style="list-style-type: none"> <li>• Is OER production and use linked to a durable academic network that bonds similar professionals across institutions, and generates social trust and reciprocity?</li> <li>• Does project management provide suitable support and promote wider networking and collaboration?</li> <li>• Is the website a pivotal resource for networking?</li> </ul>

depends upon collaboration *between* institutions. In regard to inter-institutional collaboration and sharing, the questions were framed in terms of social capital. As Putnam (2000) observes, ‘a society of many virtuous but isolated individuals is not necessarily rich in social capital’ (p. 19). Social capital, or what the World Bank (1999) terms ‘social glue,’ is particularly relevant to Health OER because the initiative will be most powerful and effective when it is embedded in a network of reciprocal social relations.

### ***Embodied cultural capital***

The OER champions at KNUST and UG have engaged in reflective practice that has resulted in jointly authored papers, such as that by Tagoe et al. (2010) presented



at the 7th Annual Open Education Conference. In all of the institutions, the academics have expressed reflective views on their OER experiences. The promise of OER was initially perceived somewhat ambiguously, but over time there was evidence of capacity to produce effective OER. Moreover, the pool of OER producers was shown to be growing. There was also evidence of a growing OER culture in the Health Sciences, although the nature of this varied institutionally, being associated with the institution-specific features indicated in Table 2.

In UG and KNUST, an OER culture was nurtured and consolidated by the Provoosts and key figures in the Health Sciences and spread incrementally. This was very much of a home-grown culture spearheaded by those with institutional power, plus the support of the visiting professor from U-M. As shown earlier, Health OER at UCT built on existing OER activities. Some of these were funded projects; others were unfunded projects undertaken by individual academics. Led by a Dean who is an energetic exponent of OER, the creation of OER has become well accepted in the Faculty of Health Sciences and some other faculties. With strong support from the Centre for Educational Technology and the office of the DVC Teaching and Learning, the culture of openness has grown organically in both the top-down and bottom-up processes across campus.

UWC presents yet another picture. Here OER development was occurring independently within Dentistry and the SOPH, both seemingly remote from any OER activities and support in the institution. Dentistry could be characterized as having an OER sub-culture originally confined to the project coordinator and a few staff working on OER although a Deputy Dean (Teaching) subsequently became responsible for the project and an OER producer. The OER culture is still confined to those with a contractual relationship with OER Health. By contrast, in UWC's SOPH, with its tradition of distance education and expertise in resource development, open licensing is but a step away. Health OER has fostered a more expansive culture of openness within a culture already predisposed to openness.

The first point worth noting is that while the OER cultural capital has assumed very different forms across institutions, in each it had been rooted in the specific institutional circumstances. The second point to be observed is the different backgrounds of the OER producers. Some had become involved because they enjoyed working with technology; others were attracted to Health OER despite a lack of technical background or ICT skills. There appears to be no correlation between age and OER adoption. In fact, the most prolific producer was an octogenarian. The third point to be made is the unintended consequence of OER production – the promotion of collegiality and the strengthening of working relationships across institutional hierarchies. The creation of OER involved senior staff, junior staff, and students. Not only did such breaking down of traditional barriers make OER involvement more appealing, it also helped to generate the cultural element essential to the entire OER enterprise: trust.

### ***Objectified cultural capital***

The 16 OER produced in the design phase were initially used internally, but by November 2010, the OER Africa website (see OER Africa, n.d.b) was housing 24 licensed OER developed by all four participating universities. Obstetrics and Gynaecology were dominant, but the list now also includes Internal Medicine, Basic

Sciences and Laboratory Medicine, Behavioural Sciences, Otorhinolaryngology, Occupational Therapy, Public Health and Family Medicine, and Public Health. Because of different production and approval methods in the participating institutions, it is not possible to say how many OER are currently in development but production is proceeding apace.

The majority of the OER are of the learning-object type but there are also entire courses and modules, lectures, tutorials, and case studies. Such diversity makes the pool of OER relevant and attractive to a wide range of potential users and suitable for a variety of purposes.

### *Institutionalized cultural capital*

The current situation in relation to OER policy, production, and support at the five universities is summarized in Table 4.

As well as observing that policy development has followed particular institutional cultures and processes, it is interesting to consider the various meanings of 'policy.' De Clercq (1997) characterizes these as:

- *symbolic* – rhetoric about intentions
- *substantive* – guidelines regarding what the governing body should do
- *procedural* – what action will be taken through which mechanisms
- *material* – provision of resources for appropriate actions.

The UG and KNUST institutional policies are essentially symbolic and substantive, providing commitment to OER and guidelines for production and access. Policy intention, such as 'faculty members should have clearly defined protected time' for OER development, is enabling but aspirational (OER Africa/ University of Michigan, 2011, p. 20). More detailed policies for staff appointments, job descriptions, workloads, are needed. However, a trajectory has been established for the

Table 4. Summary of institutionalized cultural capital across the participating institutions.

	UG	KNUST	UCT	UWC Dentistry	UWC SOPH
Process of policy making	Mainly top-down – led by Provost	Mainly top-down – led by Provost	Top-down and bottom-up	No strong operational institutional thrust; OER Africa has contributed to policy review	
Policy progress	Institutional OER policy complete; final approval pending	OER policy has been approved at institutional level	OER environment being created organically through aligning resources and structures	Institutional policies are under review; first steps being taken to mainstream the project within Faculty	Institutional policies are under review; the school is not fully mainstreamed within UWC; 80% of SOPH funds are derived through private grants, foundations, and agencies

translation of policy intention into procedural and material policies at both of these institutions. The OER are of the learning-object type, so it is appropriate for standardized production processes to be used and division-of-labour structures have been put in place. Academics provide the content and the technical specialists carry out the production work. UG has established its own production unit, while at KNUST the Department of Communication Design plays a pivotal role.

By contrast, UCT, having demonstrated its commitment to OER by signing the *Cape Town Open Education Declaration*, does not appear to see any need for either a symbolic or a substantive OER policy. With many staff producing OER, and initiatives such as the Opening Scholarship project and web portal, UCT OpenContent directory (<http://opencontent.uct.ac.za/>), both launched in February 2010, the thrust is towards aggregating and ordering a rich fund of existing assets. Institutionalizing OER is more a matter of organically weaving together top-down and bottom-up initiatives rather than one of overarching policy articulation, so there is greater focus on the procedural and material policy domains.

In the case of UWC, the 2005 policy document, although in accord with core UWC values, has essentially remained at the symbolic level and the UWC Dentistry and SOPH OER developers are left to develop policies and procedures within their own faculties.

### ***Social capital***

The 2009 Cape Town Workshop may have brought together institutions and individuals interested in OER, but these did not translate into new collaborative networks. Any networking that exists is historical rather than a result of the Cape Town Workshop or Health OER. It comprises academics in cognate areas that have traditionally collaborated on an institutional basis. This is particularly true of the Provosts and a number of leading academics at UG and KNUST.

The lack of significant new networks emerging in the Health OER project may be explained by the fact that the initial focus was on internal OER production. The model adopted was one of an incremental process in which the academics develop resources for their own students before release as OER. A notable exception to this has been the UWC Oral Radiography OER, which is digitizing and cataloguing an archive of more than 30,000 dento-maxillofacial radiographs to make this unique collection available to the broader professional community.

However, the Health OER management team is helping to establish the necessary networks. Its members have a high profile nationally and internationally and the OER Africa website is also pivotal in representing the project and extending the network. The extent of social capital to date is summarized in Table 5.

### **Judgement regarding sustainability**

Drawing on Rogers' depiction (1983) of the stages of innovation acceptance, Stacey (2010) argues that OER have come through the innovation phase, are striving for adoption, and aspire to cross into the early majority stage. Referring to Moore's portrayal (1991) of the chasm that can occur between the early adoption and early majority stages, Stacey points out that many disruptive technology innovations do not successfully cross the chasm and simply disappear – and that the adoption of OER is a disruptive innovation. Health OER has reached, or is shortly to reach, this

Table 5. Summary of social capital across institutions.

	UG and KNUST	UCT	UWC Dentistry	UWC SOPH
Within the project: networking across participants	Networking with each other (but this mainly predated Health OER)	Individual networking with other individuals mainly outside the project	Little networking	Little, but some individual networking with individuals outside the project
Broader networking	Flourishing networking on the part of Health OER management team is linking the project with broader networks Website is a pivotal resource for providing access to resources and for networking			

Table 6. Prospects of sustainability.

UG	KNUST	UCT	UWC Dentistry	UWC SOPH
Sustainable within Health Sciences, and possibly the institution Vulnerability: over-reliance on Provost	Sustainable within Health Sciences, and probably also within the institution Vulnerability: over-reliance on Provost	Sustainable within the institution: there are multiple institutional OER champions; various sources of funding for OER have been accessed	Sustainability seems unlikely at present, but recent appointment of Deputy Dean (Teaching) with responsibility for the Health OER project has promise of moving the project beyond that of 'project' status only	Sustainability within the School seems likely, if 'soft' funding can be sustained

chasm. Is the movement with its early adopters positioned to cross the chasm to an early majority and normativity? Table 6 provides a judgement on prospects of sustainability at each institution if Health OER funding were no longer available.

Such judgement is purely speculative. Moreover, because it merely concerns individual institutions, it is not illuminating in regard to the key issues contributing to general sustainability. A more instructive perspective on sustainability emerges from the fact that, as shown, the institutions represent profound differences in history, resources, and prior orientation to OER. This very diversity is valuable in exposing the variation in conditions within which OER development can operate. Because of these institutional differences, OER have taken on different forms and trajectories, both in policy development and OER genres. Although these typologies embody marked differences, each has its own logic. Taking the UG/KNUST typology as an example, the focus on learning objects implies that a standardized learning design model is appropriate. OER of this type can be used anywhere to support any existing curriculum and the pedagogical issues are generic. Both institutions have adopted this approach. On the other hand, given the number of UCT academics who have

produced OER on their own initiative, there is logic in that institution's strategy of keeping all aspects of production, including quality assurance, close to the author(s).

Respecting institutional autonomy, acknowledging institutional integrity, and encouraging the institutions to take ownership of OER development gives the project *credibility*; and credibility enables these institutions to utilize their own resources to support OER in ways that contribute to *viability*. Without credibility and viability, sustainability would be unlikely. However, these alone will not ensure sustainability. Many other factors will undoubtedly come into play as a project grows. However, contrary to any staff concerns that others would appropriate their work, benefit unfairly, or criticize their endeavours, copyright clearance activity within individual institutions has in fact helped to regularize and restore practices that protect authors' rights. In clearing existing resources for copyright, this process has dealt with attribution that was reportedly almost normatively cavalier, especially in regard to the use of images.

### Conclusion

So what are the implications for OER development and sustainability in the broader African context? In the design phase of Health OER, it was evident that significant institutional progress was rooted in the resonance of OER with African conditions. Designing and utilizing OER to meet the challenge of staff–student ratios emerged strongly, particularly in Ghana. In many clinical situations 25 or more students was the norm, and in one Pharmacology Department the student numbers had increased from 32 to 250–260 over recent years. When students in clinical situations are crowded around a patient, experiment, or small-scale demonstration, as occurs, for example, in Dentistry, they have either limited or no view of the case in hand.

It has been concluded that the essential preconditions for sustainability – credibility, and viability – have been achieved within the participating institutions. Evaluation of the first two years of the project validates the rationale on which Health OER was based: the need for OER use in Africa and relevant OER produced by Africans. However, the project has not yet met the expectation that OER creators would 'make use of OER from the developed world and adapt it for appropriate use locally' (Ngugi, 2009, p. 2). In fact in one case, the converse has occurred. KNUST's OER prepares students for treating one of the most neglected but treatable tropical diseases, the Buruli ulcer, caused by an organism belonging to the same family of bacteria that cause tuberculosis and leprosy. This particular OER has not only been used at KNUST and by local community health workers but at U-M in the USA. Because there are no, or very few, existing African resources, and because many from elsewhere appear inappropriate, the academics in the Health OER project reported that it was easier to produce these OER themselves, starting from scratch. This runs counter to the proposition that OER enable the creation of new courses and courseware to be accelerated through collaborating, harnessing existing materials, and sharing costs. In this case, developing the OER only increased the workload of the pressurized staff. The issues of African academics regarding OER from elsewhere as inappropriate for adoption and adaptation and the trade-offs between the extra workload and the educational benefits are issues requiring further exploration.

Research by Anderson (2009) and others suggests an overwhelming hesitancy on the part of OER creators to adapt or reuse other academics' content. It might be

surmised that the traditional modes of working individually are so deeply ingrained in academe that when embarking on OER production, academics will not start by searching for suitable resources that they might use or build upon, or it may be that existing resources are so inadequately tagged that accessing them is too time-consuming. It was found that UWC SOPH was developing its own taxonomy because it found the Dewey system too medical and inappropriate for the school's stronger framing within the social sciences. However, *content* is but one aspect of OER; another is *pedagogy* and another is *cultural consonance*.

Quality teaching and learning in any discipline requires the materials and methods to be tailored to the specific contexts and cohorts of students. As shown, some OER producers are primarily concerned with addressing the problems of large student numbers. Others emphasize the importance of OER that enable medical students to practise in contexts which lack the necessary high-tech equipment. Some Ghanaian and South African OER developers have stressed the importance of cultural consonance between the teaching and learning materials, students' characteristics and patients they will be dealing with, particularly with regard to communications. Health practitioners need to understand what the patients are telling them about symptoms, just as the patients have to understand what they are being told about the treatments and prescriptions. One of the Health OER projects takes social/communication needs into account by requiring the students to become proficient in two of the indigenous languages of the populations they serve. A clinical skills DVD covering the examination of respiratory, neurological, and cardiovascular systems is also being translated into indigenous languages.

Overall, the evaluation data show that some African developers are prepared to embark on the hard route of producing OER from scratch in order to meet pressing needs in specifically African health education and training contexts. However, despite encouraging progress in the Health OER project, there is still much to be discovered and acted upon to ensure that African-produced OER incorporate appropriate content and pedagogical methods, can be used sustainably by and between different institutions and health agencies, are appropriate in different cultural and community contexts, and can be useful in national and regional contexts. Research into such issues is already occurring within the Health OER project.

### Notes on contributor

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