Growing an Institutional Health OER Initiative:

A Case Study of the University of Ghana

Background

The University of Ghana (UG) is the oldest and largest public university in Ghana. Founded in 1948, UG now serves 30,000 students and is distributed across three campuses: Legon, Korle Bu, and Accra City.

The College of Health Sciences (CHS), established in 1999, comprises the Medical School, Dental School, School of Pharmacy, and School of Allied Health Sciences, housed on the Korle Bu campus, and the School of Public Health, School of Nursing, and Noguchi Memorial Institute for Medical Research, located at Legon. According to the UG website, the CHS mission is 'to produce highly qualified and competent health professionals and medical scientists to provide promotive, preventive and curative services to meet the health needs of the nation and the global community through world class excellence in teaching, research and dissemination of knowledge'. A handful of UG teaching faculty and other staff have produced and used Open Educational Resources (OER) for several years, but in 2008 CHS became the first of the university's eight colleges and faculties to launch a college-wide initiative for OER.

What are Open Educational Resources?

Open Educational Resources (OER) are educational materials and resources offered freely and openly for anyone to use and under some licences to adapt, copy, and redistribute. OER can include course syllabi, presentation slides, image collections, animations, videos, textbooks, research papers, and self-assessments.

In November 2008, the William and Flora Hewlett Foundation sponsored a pilot activity to develop health OER through collaboration among four universities in Ghana and South Africa. The subsequent 2009 health OER project was a joint effort among the Colleges of Health Sciences at UG, the Kwame Nkrumah University of Science and Technology (KNUST), the University of Cape Town, and the University of the Western Cape. In late 2009, the partner institutions submitted a successful application for a two-year, follow-on grant to the Hewlett Foundation and launched an African Health OER Network, to foster a continent-wide effort to share knowledge, address curriculum gaps, and use OER to advance health education. The University of Michigan and OER Africa, an initiative of the South African Institute for Distance Education (Saide), have co-managed both grants.

When the UG health OER initiative began two years ago, CHS Provost Aaron Lawson and Professors Kobina Nkyekyer and Richard Adanu established a small committee to oversee adoption of OER within CHS. A talented and enthusiastic team of teaching faculty and other staff from within CHS and the Information and Communication Technologies (ICT) Directorate was assembled, to drive the activities. As part of their OER efforts, CHS faculty have produced four comprehensive, interactive OER modules, used and adapted OER from other institutions, and proposed a new institutional policy to support OER. The team aims to grow OER across UG and KNUST and into the other public universities in Ghana.

This case study is the result of semi-structured interviews conducted in 2010 with teaching faculty, other staff, and students involved in health OER activities at UG. Interviewees (listed at the end of this study) gave their consent for the author to use their names and direct quotations, and their words are included here verbatim. The study explores CHS's experience with OER, highlighting strategic priorities, perceived benefits, achievements, challenges, production processes, lessons learned, future plans, and participants' advice for others interested in creating their own institutional OER initiatives.

Strategic priorities

UG and CHS have four strategic objectives that provide a foundation for their OER activities.

Expand distance education enrolment and offerings

UG attracts students from all over Ghana and internationally. The vast majority of the university's courses are taught face-to-face (also known as 'contact sessions'), but a small subset of courses is taught through distance education, either paper-based or online. The Institute of Continuing and Distance Education has 10 regional centres across Ghana, where students studying at a distance occasionally meet, including to sit for examinations. UG is aiming for a significant increase in the number of students enrolled in distance education by 2015, with the ultimate goal of expanding distance education to cover half of all enrolled students.

> *The university has a target that at least half of its population will be taking courses outside of campuses and it has a vision of providing rich content electronically for its students. So OER provide a great opportunity for the university to achieve that end.*
>
> *Patrick Kuti, webmaster, ICT Directorate*

In 2009–10, UG partnered with Unisplendour Software Systems Corporation Limited of Tsinghua University in China, the Ghanaian Ministry of Finance and Economic Planning, and a Chinese credit agency to expand the use of technology within its distance and continuing education programmes. UG plans to debut a web platform to support distance education in 2011.

Strengthen student preparation for clinical practice

Clinical training is an essential component of health education. Participation in laboratory sessions and ward rounds provides students with opportunities to apply their knowledge in a practical context. In recent years, class enrolment has grown much faster than can be accommodated by the hospital and classrooms. There are often over 25 students and residents on ward rounds, making it difficult for students to see the demonstrations by their professors. While such infrastructure challenges limit in-person viewing, CHS faculty are able to offer students a close-up view through media-rich OER. By developing OER that focus on clinical care, CHS faculty can supplement hands-on training with a magnified view of their demonstrations.

> *The College [of Health Sciences] wanted to enhance medical education by using OER as a pre-preparation to the ward. So, before a student gets to the ward, he or she is prepared and would be able to ask and answer relevant questions once in the wards.*
>
> *Chris Yebuah, OER media specialist, CHS*

Develop new degree programmes in health

In 2009, CHS expanded its degree offerings to include the Graduate Entry Programme in Medicine for students with a previous university degree. In 2010, Provost Lawson announced plans to establish a new School for Biomedical Sciences within CHS. With these recent changes, CHS lecturers are exploring new topics, building new curricula, and reaching out to different student populations. Provost Lawson views OER as complementary to these programmes, offering new potential for course delivery and an opportunity to build on curricula from elsewhere.

> *The Medical School started a new programme, the Graduate Entry Programme, which runs parallel with the traditional programme. That programme needs something like OER because we aren't going through the traditional way of teaching.*
>
> *Aaron Lawson, provost, CHS*

Showcase specialized knowledge

Western publishers dominate many leading international medical journals and textbooks. Cases included within those publications, therefore, often feature Western practices and images of Caucasian patients. University of Michigan students and professors who do research or clinical rotations in Ghana often comment on the differences between diagnostic procedures there and in the United States (US). For example, hospitals in the US are more likely to rely on expensive equipment to assist their diagnosis – equipment that may not be available in hospitals in Ghana. A University of Michigan final-year medical student observed that his peers who do part of their clinical rotations abroad often return to Michigan with more confidence in their ability to diagnose because they have learned to rely on their knowledge and simpler equipment. Aware of their unique expertise, CHS instructional staff aspire to share their specialized knowledge with their students and their global peers.

> *One lecturer has a very simple method for a Caesarean section. He has been asked to teach it to the Netherlands. He asked me if one of these days I would come and video it properly for OER.*
>
> *Chris Yebuah, OER media specialist, CHS*

Perceived benefits of OER

Faculty and staff at UG who create OER are motivated by the various potential benefits of making their teaching materials publicly and globally available.

Global visibility for faculty and staff members

Because OER represent a public portfolio, some faculty view creating OER as tantamount to publishing in an academic journal, even though the UG policies do not currently equate OER to peer-reviewed journal articles. Since OER are distributed with attribution to the individual creators and institutions, authors gain increased visibility. Once the OER are posted online, they are then indexed by Google and distributed to various search engines and content-sharing sites. The increased visibility may attract prospective students, potential collaborators, or even research funding.

> *Africa is now contributing to the database of educational material. Once you have done that, apart from whatever credit you will get and stuff, there is a psychological feeling of, 'Hey, man, I've got my stuff out there'.*
>
> *Chris Yebuah, OER media specialist, CHS*

Reduced workload on materials development

Harnessing open content can reduce faculty time required to produce teaching materials. OER make it easier for educators to preview how others in their field teach a given topic. The open licence permits faculty to use OER created by others, in whole or in part, to develop their own teaching aids.

> *[With OER] editing of the [instructional] materials becomes easier and you can easily edit instead of now starting afresh to build up. And we have other materials from other places and you can easily compare. If you don't have it, you can pick it from somewhere else.*
>
> *Samuel Aggrey, assistant librarian, CHS*

Access to more educational resources for less

Like many academic libraries, the library at CHS spends a significant amount on licensing fees for journals and databases. The assistant librarian, Mr Samuel Aggrey, views OER as a method for increasing the range of academic materials offered to students and faculty. Unlike traditional textbooks and journals, OER do not require licensing fees. Although OER are not free to produce, they are free to access. There may still be a marginal cost for distributing OER (e.g. for printing, CDs, or servers), but it is a fraction of the standard licensing fees. Mr Aggrey views open learning modules and other OER as complementary to open access journals in health sciences, such as those published by the Public Library of Science (http://www.plos.org).

Increased student interaction with learning materials

When OER are distributed electronically, they are easy to access via a computer, to copy, and to share. This is true of any electronic learning resources, whether openly licensed or not. Rather than restricting access to enrolled students, OER are available to students and educators in a variety of settings. Students can, therefore, access materials developed by their own lecturers and by educators from other universities. Students may also view the material in their own time and at their own pace. Several faculty interviewed envisage that OER will enable them to codify their lectures, allowing students more time for interactive discussions during class time.

> *It's going to readily assist or enhance the impact of knowledge in the university. With the introduction of OER, we believe that students are going to gain access to quality learning material. It will also enhance the interaction between themselves and faculty members since it is difficult here to gain one-on-one access. If there is a way that allows students to virtually communicate with [other] students and teachers, it will help. So it's going to change the way learning and teaching happen here at the university.*
>
> *Patrick Kuti, webmaster, ICT Directorate*

Standardization of curricula

By publishing OER, individuals and institutions are providing a window into their classrooms. OER allow faculty to preview how a topic is taught at other institutions and compare it with local methods. Such transparency allows opportunities for curriculum analysis, which may facilitate standardization within and across institutions.

> *What will happen when this is done is that it will tend to standardize things and the students will understand or grasp that this is what they will be expected to know.*
>
> *Nii Armah Adu-Aryee, general surgeon and clinical instructor, Medical School*

Accomplishments

Over the past two years, many CHS faculty have participated in OER activities. Their accomplishments include learning how to create OER, producing OER modules, introducing their students to OER, using and adapting OER from other institutions, developing expertise in open licensing, and proposing a new institutional policy to support OER.

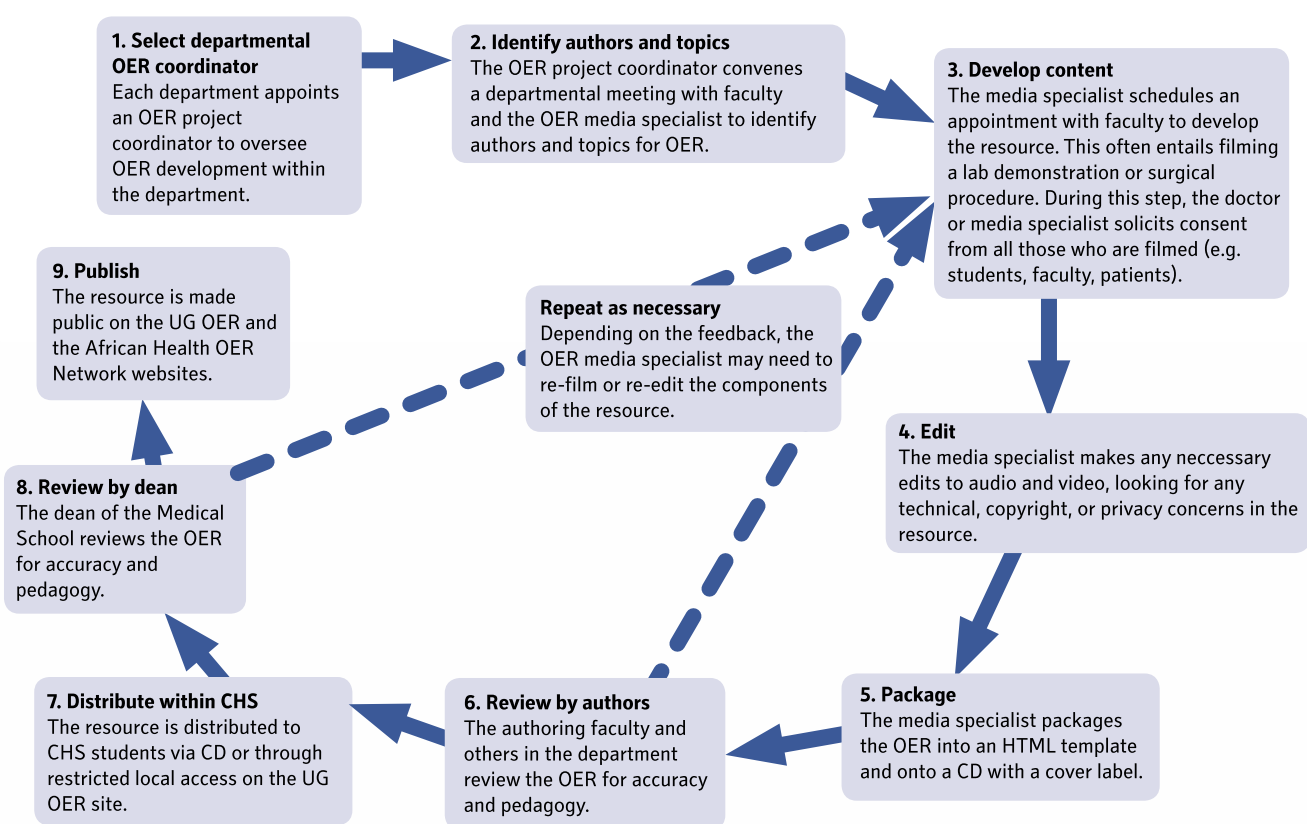### Trained faculty and staff in OER policy and production

CHS has organized several OER workshops since the launch of its OER initiative. Through these workshops, teaching faculty and other staff have learned the basic principles of OER advocacy, open licensing, content production, and content distribution.

• In February 2009, the provost assembled representatives across CHS to propose topics for OER that would address curriculum gaps and/or showcase the expertise of the CHS faculty.
• In the same month, OER Africa and the University of Michigan conducted policy review and OER production workshops (licensing, copyright clearance, multimedia software, and distribution methods) with CHS faculty and librarians.
• In July 2009, two University of Michigan staff members conducted a small, hands-on multimedia and OER production workshop with CHS faculty and other staff.
• Later that month, Professors Nkyekyer and Adanu facilitated two OER awareness workshops with CHS faculty.

Professor Cary Engleberg of the University of Michigan Department of Internal Medicine spent a year-long sabbatical (from August 2008–August 2009) at KNUST, assisting faculty with OER content development. During his sabbatical, Professor Engleberg also supported several UG medical professors in developing OER for obstetrics and gynaecology (ob/gyn), and co-led the February and July 2009 OER production workshops. In January 2010, CHS hired Mr Chris Yebuah as a full-time media specialist to assist faculty with content development. With an undergraduate degree in chemistry and professional experience in film and television, Mr Yebuah's strong basic science knowledge and advanced multimedia skills have proved invaluable for OER production. Mr Yebuah filmed and packaged all of the OER developed during 2010. In November 2010, UG hired a second full-time media specialist to support OER. The diagram below represents the OER production process that emerged out of the UG Medical School OER activities in 2010.

UG Medical School OER production process

1. Select departmental OER coordinator
Each department appoints an OER project coordinator to oversee OER development within the department.

2. Identify authors and topics
The OER project coordinator convenes a departmental meeting with faculty and the OER media specialist to identify authors and topics for OER.

3. Develop content
The media specialist schedules an appointment with faculty to develop the resource. This often entails filming a lab demonstration or surgical procedure. During this step, the doctor or media specialist solicits consent from all those who are filmed (e.g. students, faculty, patients).

9. Publish
The resource is made public on the UG OER and the African Health OER Network websites.

Repeat as necessary
Depending on the feedback, the OER media specialist may need to re-film or re-edit the components of the resource.

4. Edit
The media specialist makes any neccessary edits to audio and video, looking for any technical, copyright, or privacy concerns in the resource.

8. Review by dean
The dean of the Medical School reviews the OER for accuracy and pedagogy.

7. Distribute within CHS
The resource is distributed to CHS students via CD or through restricted local access on the UG OER site.

6. Review by authors
The authoring faculty and others in the department review the OER for accuracy and pedagogy.

5. Package
The media specialist packages the OER into an HTML template and onto a CD with a cover label.

Developed learning modules to support the four basic clinical exams

Lecturers and senior faculty of the Medical School have authored comprehensive learning modules for the four basic clinical examinations: ob/gyn, internal medicine, surgery, and paediatrics. Each multi-part module is over an hour in duration and features close-up footage of medical procedures and commentary by multiple lecturers. The completed OER are currently posted on the CHS internal OER website. The UG OER site is currently only available through the local area network, as technical support staff have been struggling to get sufficient bandwidth and power to host a public server at the Korle Bu campus. For this reason, the 2009 resources are posted on the KNUST (http://web.knust.edu.gh/oer), OER Africa (http://www.oerafrica.org/healthoer) and the University of Michigan (http://open.umich.edu/education/med/oernetwork) websites. The resources developed by UG in 2010 will soon debut on the OER Africa and the University of Michigan servers.

## Used and adapted OER from elsewhere

In addition to producing their own OER, several faculty have made use of OER from elsewhere to inform their own teaching. Medical Professor Richard Adanu included KNUST OER, on how to do an obstetrics examination, in his ob/gyn module. Mr Tom Ndanu, a senior research fellow in the Dental School, selected several dental videos from the University of Michigan OER collection to share with his students. Mr Ndanu also used OER from Johns Hopkins Bloomberg School of Public Health to assist him in developing his own teaching materials on nutrition policy.

> *I was looking for information on nutrition policy and I went to Johns Hopkins University. I downloaded an OER. I have read it and it has just enriched my understanding and preparation of a nutrition policy. I have been involved in developing [a nutrition policy] for Ghana School of Health Education Programme. The document from the university [Johns Hopkins] broadened my outlook and understanding. So if we develop our own OER here, they also can learn some things from us.*
>
> *Tom Ndanu, senior research fellow, Dental School*

Engaged with senior and retired faculty

Many of the early participants in OER at CHS have now become OER advocates. Support for OER has been particularly strong in the Medical and Dental Schools, with over 15 medical and 5 dental faculty participating. Senior faculty in the Medical School have been especially active in OER at UG. The paradigm of opening one's teaching materials to the general public is new to many of them, but it presents an additional opportunity to capture and archive knowledge. These senior and retired faculty view OER as a method for imparting their wisdom to the next generation of doctors and for bequeathing their teaching legacy to the school through video.
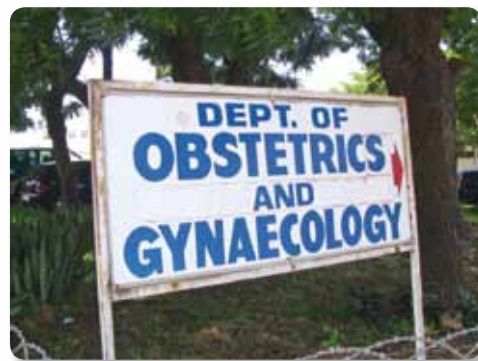
> *We have a number of old professors in the system who have got a wealth of experience. They are so enthusiastic about OER production that a lot of them have produced some material and this is very good because of their experience in teaching students over such a long time.*
>
> *Aaron Lawson, provost, CHS*

Distributed OER to students

In a small 2009 pilot study, Professor Adanu distributed a module on total abdominal hysterectomy to 19 final-year medical students. Two weeks later, the students were given a one-page questionnaire regarding their usage of the OER. Based on the survey, he determined that computer ownership or availability is sufficient to allow access to electronic-based learning materials and that all students believed the programmes to be more effective than other learning methods. Students have access to computers, but Internet connectivity and reliable electricity remain obstacles. The OER are therefore often distributed on removable media such as CD or USB flash drive. Professor Adanu documented his results in a paper that he co-wrote with colleagues at UG, KNUST, and the University of Michigan, which was published in the December 2010 issue of the *Ghana Medical Journal* (http://www.ghanamedj.org/pastjournal.php?JID=25).

In 2010, a few faculty distributed OER to their classes. Professor Adanu distributed the ob/gyn OER module on CD to all 80 second-year medical students. Mr Ndanu loaded several dental OER videos from the University of Michigan onto the computers in the Dental School student computer laboratory. Both of them recommended the OER for supplemental learning. Several medical students who were interviewed commented that the resources were helpful, and that these resources gave them a richer understanding of the procedures when they witnessed them in person.

Some of the final-year [medical] students came around and said, 'Hey, I hear you have a video on internal medicine. I'm going to have my exams soon. I need to freshen up on it'. And so I just gave the discs to them because I know they are open educational resources.

Chris Yebuah, OER media specialist, CHS

The ob/gyn OER CD was very helpful. Sometimes it's quite difficult to get enough information from a surgical procedure. For example, you go to the theatre and they [the lecturers] are quite busy and you cannot ask them at every stage what's going on. So to have a CD that you can watch at your own convenience and view it as many times as you want ... is really good because it kind of gives you an idea before you go into theatre.

Charlotte Agyepong Yamoah, second-year medical student

Proposed OER policy

In 2009, CHS initiated a process to update its academic recognition policies to support OER. The policy review coincided with the university's regular policy reviews, which are conducted every three years. A small committee of CHS faculty and librarians examined existing university policies regarding intellectual property and performance reviews. The committee drafted a new policy and began the process of moving it through three committees at different levels of the university administration. Both the University of Michigan and OER Africa provided input on the draft policy that supports OER. The draft policy is divided into eight sections: infrastructure, availability and accessibility, Internet access, organizational structure, quality control, copyright, reward system, and time protection. It reaffirms the university's copyright to materials produced by faculty and staff, but establishes the Creative Commons Attribution (CC BY) licence as the default licence for all OER, and gives authoring faculty the right to select an alternative Creative Commons licence. It also proposes the creation of a production unit for OER staffed by technology professionals, and a server to host the completed OER. Lastly, it suggests that OER be reviewed by contributing departments prior to publication, that faculty get time earmarked for creating OER, and that authoring faculty receive academic recognition for their OER. At the time of this writing, the draft policy is with the academic board, in its third and final stage.

Open educational resource material produced by faculty members should be seen as intellectual products, which count towards career advancement. It is recommended that three OER materials be considered equivalent to a peer-reviewed publication. However this equivalence ratio should be guided by the level of complexity of the material produced. In order not to kill conventional research resulting in peer-reviewed publication, a faculty member should not be promoted solely on the production of OER material in lieu of peer-reviewed publications. The appointment letters of faculty members should indicate the production of OER material as one of the core activities of faculty.

Excerpt from draft OER policy

Challenges

Several obstacles limit the understanding and use of OER at CHS.

Limited faculty availability

Accessing OER is free, but creating OER can be time-consuming. So far, CHS has focused primarily on creating educational content from scratch rather than building upon OER available from elsewhere. This approach has prevented CHS from taking advantage of the time-saving potential offered by OER. CHS faculty are extremely busy individuals. Most lecturers have to balance teaching obligations, clinical service requirements, and research expectations. There are only 0.15 doctors and 0.92 nurses per 1,000 Ghanaians, which is well below the World Health Organization's recommendation of 2 doctors and 2.5 nurses. Consequently, Mr Yebuah has found it difficult to schedule time with CHS faculty to develop and review OER.

> *The biggest challenge has been availability of time of faculty members for production. To get one [clinical exam preparation] module out, one needs to go after faculty members several times. Scheduling is difficult.*
>
> *Richard Adanu, professor, ob/gyn*

Confusion between OER and e-learning

OER and e-learning activities within CHS emerged around the same time. For this reason it is sometimes difficult to separate the two concepts in the minds of faculty and students. So far, OER include any educational material – electronic or paper-based – that is free and permits use, remixing, and distribution. Because electronic resources are easy to update and share, OER are often distributed in electronic format as a matter of convenience. However, OER are not always electronic resources. Furthermore, OER that are in electronic format are not necessarily e-learning. The term e-learning usually refers to comprehensive programmes and mini-courses alike, which are complete with learning objectives, detailed textual explanations, animations, video, sound, and self-assessments. E-learning programmes may or may not be OER depending on how they are licensed. Although some CHS faculty and staff now understand that OER have a Creative Commons licence and non-OER do not, the majority of the interviewees (including all of the medical students) did not voice this distinction.

Weak technology infrastructure

CHS faces a number of technology infrastructure challenges, such as frequent power outages and fluctuations, inconsistent network access, limited bandwidth, and a lack of faculty and student awareness of existing ICT services. Over the past two years, the ICT Directorate has participated in one university-funded and three externally funded network improvement projects to strengthen Ethernet and Wi-Fi networks on its Legon and Accra City campuses. In September 2010, the ICT Directorate more than quadrupled the bandwidth at Legon and set up a virtual private network to connect the other two campuses. To address the lingering infrastructure challenges, OER are often distributed to students on CD. The ICT Directorate also plans to mirror the OER on servers at Legon and Korle Bu.

> *[OER] are readily made available but the barrier that I keep mentioning is infrastructure –*
> *non-existent infrastructure – which we are trying to fix.*
>
> *Patrick Kuti, webmaster, ICT Directorate*

Limited faculty familiarity with technology

Technology adoption among faculty for teaching and research is low. Assignments are largely paper-based. As many of the CHS-developed OER are distributed electronically and publicly, authoring faculty would like to have professional-quality, media-rich resources. The media specialist is able to assist with much of the production, but several lecturers are interested in learning basic multimedia skills so that they can do some of the content development themselves.

> *I'm not saying that we will make people like [the OER media specialists] redundant because we'll still*
> *need the services of technical personnel. But I think that one of the major challenges is getting faculty to*
> *get into the software and be able to do some of the simple things.*
>
> *Kobina Nkyekyer, vice dean for medical education, Medical School*

Lessons learned

The past two years of experimentation with OER have led CHS to revisit and revise its expectations of OER, specifically the level of effort involved in producing media-rich materials that are both educationally effective and openly licensed.

Local media-rich content development is possible

When presented with examples of some OER developed by other institutions, several CHS faculty were intimidated both by the level of technical sophistication and the content-clearing process. A few even questioned their own abilities to produce such materials. With a dedicated media specialist and supportive faculty in medicine and dentistry, CHS has demonstrated that it is possible for such faculty to produce high-calibre, media-rich, interactive learning materials.

Well, I think the greatest achievement has just been the fact that we have shown that this thing can be done. I think I would say that is the greatest achievement. I mean, the students are using the materials and find them helpful. But the biggest thing is just overcoming that barrier of, 'Can we really produce such things?' And now the answer is clearly 'yes'.

Richard Adanu, professor, ob/gyn

Technical training is not a big issue. It's not a big issue, honestly, because there are really smart guys out there who can just get things done. It's just the main issue is knowing what to do and being given the opportunity to do it.

Chris Yebuah, OER media specialist, CHS

Patient consent for OER should be formalized

Since the Medical School focuses on developing OER to support clinical examinations, the media specialist is occasionally required to film surgical procedures. CHS respects patient privacy and strives to solicit informed consent from patients who are recorded. CHS identified the need to create a dedicated form for OER, to explain how the recordings will be used. Building on its existing patient privacy policies, CHS has developed a consent form for patients to sign, and also offers the alternative option of obtaining oral consent on video. The consent form explains how the video will be used, that it will be available online, and that the media specialist will remove any personally identifiable features (for example, faces) from the video before distributing. The form also gives patients the right to decline to participate and assures them that non-participation does not affect their medical care.

> *Part of our consent [process] is to be able to differentiate between patients' consent to participate in OER, and patients' 'fright' .... I actually have to make sure that the patients understand that they have a right to object and that if they decide to object, it will not affect the kind of treatment they are going to get or the attitude of the health worker.*
>
> *Chris Yebuah, OER media specialist, CHS*

Multimedia staff must liaise closely with authoring faculty

CHS is very fortunate to have a media specialist who has a basic sciences background. Mr Yebuah is not, however, a medical doctor. At first, limited domain knowledge made it difficult for him to understand the context or focal points of the surgical and laboratory procedures that he was filming. After filming several surgical procedures, Mr Yebuah realized that he needed to confirm their basic structure with faculty prior to filming in order to ensure that he highlighted the appropriate parts.

> *When you go and film in the wards, there is so much knowledge. A medical person would see it but I couldn't tell, so that was a barrier. I had to quickly learn and understand the basics of what is happening in medicine as well. [When filming] I had to personally take interest. I could not treat it like, 'Hey, I am a video guy. I have got nothing to do with medicine'. I had to take a personal interest that, 'Hey, I need to get this'.*
>
> *Chris Yebuah, OER media specialist, CHS*

Speed of producing and reviewing OER must be addressed

CHS faculty view OER as a marketing opportunity, and therefore strive to create professional-quality, interactive learning materials. This approach yields stimulating, interactive resources with rich media (in contrast to basic syllabi or lecture slides), but these resources are time-consuming to create. Over half of the steps in the current OER production process are, unfortunately, dependent on lecturers' restrictive schedules. Furthermore, the intense internal peer review process results in high-quality OER but at a very slow rate of production.

> *When we started, the impression was that this was going to pick up very fast, but it is a slow process simply because people don't get specially protected time to be involved in producing this material. It's because of the shortage of staff .... People have to do this in addition to everything else that they do and so it's a slow process. But once people see what they have produced, they get excited and want to do more.*
>
> *Richard Adanu, professor, ob/gyn*

Awareness of the health OER initiative on campus is low but growing steadily, and only a few CHS faculty have accessed or adapted OER from UG or elsewhere. This means that while CHS faculty have a sense of how much time it takes to produce OER they do not yet have a sense of the time that can be saved every year by using or adapting existing OER developed by colleagues at UG, KNUST, or other institutions. The emphasis on producing OER over adapting or using existing OER has meant that some faculty have in fact devoted more time to developing media-rich, interactive OER than they had previously spent on materials development. Several CHS faculty and other staff intend to address this dilemma in the future by searching for and adapting more OER from elsewhere.

OER should be modular for ease of use

The OER that were developed in 2010 were packaged into four comprehensive OER modules. Each of the modules features multiple subtopics, each with its own authors and videos. Each module (with its many subtopics) is often distributed on a single CD and less often as a large compressed file on the UG OER website. Given infrastructure constraints, the large file size makes it difficult for people within UG or from other universities to download each module. Splitting each module further into its corresponding subtopics would make it much easier to distribute. Structuring the modules into smaller units might also make it easier for students to concentrate as they use the materials.

Some people might not pay attention to a series of 30-minute videos …. To enable concentration, I'm wondering how we are going to handle breaking it into packages. Virtually all of the OER modules are one large unit. So how do you break it into smaller units that the student can easily use and easily download?

Samuel Aggrey, assistant librarian, CHS

Next steps

CHS has ambitious goals for the next two years to advance OER use and production on campus.

Advocate for the OER policy to the academic board

Several CHS faculty are anxiously awaiting official academic board approval of the OER policy. If the policy is accepted, then OER will be a university-wide initiative and faculty may receive the proposed academic recognition and reserved time for OER production. Provost Lawson and Professors Nkyekyer and Adanu plan to present the policy to the board soon.

> *Recently I realized that if the [academic] board has not seen any of the completed OER, it would be very difficult for them to analyse the document. Although I have talked with them at an executive committee meeting of deans together with the vice-chancellor, I think that I will go there and then make a presentation to them on one of our productions .... So once we have the policy in place, then other disciplines in the university – say law, humanities, and so on – can be roped in so that it will be a university-wide programme.*
>
> *Aaron Lawson, provost, CHS*

Expand the OER initiative within CHS

CHS plans to continue and grow its OER activities. Following the examples of Professor Adanu and Mr Ndanu, other lecturers intend to incorporate the UG OER modules that have been developed into their classroom instruction. For his next project, Professor Adanu would like to develop or adapt interactive OER modules to support an entire course. It would be a hybrid course combining e-learning and traditional classroom instruction, but all of the e-learning materials would be licensed as OER. The Dental School plans to develop content to support dental anatomy, dental morphology, dentures and orthodontics. CHS aims to recruit new faculty participants from the Schools of Pharmacy, Public Health, and Nursing.

> *Nursing received a grant from SickKids Hospital in Toronto and part of the programme is to train paediatric nurses. So I told the dean about the [OER] module that has been produced [in paediatrics]. So I am sending a copy to her to look at, use whatever she can use, and then hopefully contribute more OER productions in nursing.*
>
> *Aaron Lawson, provost, CHS*

Train faculty in basic film and audio recording and editing

Several CHS faculty are interested in learning basic multimedia skills so that they can do their own recording for their OER productions. Their main motivation for this is to capture rare clinical cases as they occur, rather than trying to coordinate schedules with an OER media specialist. In this proposed model, an OER media specialist would still provide technical guidance and editing, but the CHS faculty would have the know-how to do some of the filming on their own. The ICT Directorate also plans to hire an educational technologist to assist faculty with integrating technology into their teaching.

> It's our plan to get to the point where we don't really have to use a specially trained person to do the videoing .... Certain cases appear for which you don't have time to call people to come and film. I envisage that it wouldn't just be one person who goes round to video well laid down procedures. We would have advanced so much that when this rare case comes, he [the doctor] just has a Flip camera and when he is done, he just sends it over to the OER office.
>
> Chris Yebuah, OER media specialist, CHS

Spread OER to other Ghanaian universities

CHS began its health OER initiatives around the same time as KNUST. In addition to UG and KNUST, two of the other four Ghanaian public universities – the University of Cape Coast and the University for Development Studies – have new degree programmes in health sciences, which could benefit from the OER produced by UG and KNUST. Provost Lawson hopes to recruit those other two universities as health OER producers, users, and advocates. The open licensing of OER complements the Ghanaian government's policy of encouraging coordination and preventing replication among the public universities.

> We hope that we will be able to extend it to the University of Cape Coast. They have a Medical School there and at the University for Development Studies in Tamale. Both institutions run problem-based learning, so they will benefit a lot from OER modules. So what we – Peter Donkor [the provost of CHS at KNUST] and myself – have to do is to talk to their deans and then get them involved in it.
>
> Aaron Lawson, provost, CHS

> It has been the government policy that they do not want to have duplication [at the public universities]. So the tradition has been that before anything is done, one will go and find out from other institutions if they are running the same course and how it is being done. So if we are running a course here and then Cape Coast wants to do a similar [course], they come here to find out what we are doing. Then after looking at what we are doing, they give theirs a little 'twist' ...
>
> Samuel Aggrey, assistant librarian, CHS

Advice for other institutions

Interviewees were asked to provide advice to other institutions interested in launching their own OER initiatives. In their responses, interviewees spoke about the potential benefits of OER, while offering practical guidance on how to produce OER and how to make use of OER created by others.

Open is worthwhile

Using adjectives such as 'innovative', 'transformative', 'collaborative', and 'cost-effective', interviewees reaffirmed their belief in the potential benefits of openness and encouraged other institutions to join the global OER movement.

> *I think that OER have the potential to make a tremendous impact on the way our students learn and on the methods of teaching.*
>
> *Kobina Nkyekyer, vice dean for medical education, Medical School*

> *If it's been so expensive for you to publish your stuff and it's been so expensive to get your stuff abroad, this is the opportunity. You understand? You gain more from giving out information.*
>
> *Chris Yebuah, OER media specialist, CHS*

> *If OER are developed locally with local content and also in collaboration with other institutions, and these materials are readily available, it will be a big plus for education, both for our students and the lecturers.*
>
> *Tom Ndanu, research fellow, Dental School*

Target senior faculty for content development

The CHS provost at UG advises other universities to follow the CHS example of targeting senior faculty for OER production. These faculty have deep expertise that should be preserved, and OER offers one method for doing that.

> *The experienced faculty must be roped in because they have taught for many years and they have a wealth of experience, which can be put into the OER production. But they must mentor the junior faculty also to get involved so that together the OER system will grow in a new university.*
>
> *Aaron Lawson, provost, CHS*

Increase support for OER by leading by example

Several faculty interviewed encouraged other institutions to engender support for OER by doing pilot projects. They recommended that institutions start small by developing a few high-quality OER modules and sharing them with colleagues in their departments. In their recommendation, they suggested that others focus on quality, not quantity, and ardently promote the resources once they have been developed. Mr Ndanu predicted that once other faculty and departments use the OER, friendly competition would drive them to create their own OER.

> *Once a department has finished an OER, they become superior to the others. 'Hey, we have done something. We have done our [OER] videos. What are you guys waiting for?' And then at some point when they [the leadership] go to meetings, they will say, 'Okay, so what does this department have? Medicine has something to show. This department has something to show'. So it will seem like the others are being left behind, so they must also join.*
>
> *Tom Ndanu, research fellow, Dental School*

Make use of OER developed elsewhere

Some interviewees mentioned the wealth of existing OER available. They encouraged colleagues to optimize their time by using and adapting existing OER before developing their own OER or other teaching materials.

> *You ought to maximize the use of your resources. If you are in a country and there are things unique to your country, then create OER. I really don't believe in every single institution creating a full set of OER files. I think people should do as best as they can to collaborate.*
>
> *Nii Armah Adu-Aryee, general surgeon and clinical instructor, Medical School*

Others worldwide can benefit from your unique expertise

Several interviewees remarked that their African colleagues possess specialized knowledge that could be useful to health professionals around the world. With globalization, health professionals are likely to encounter patients who are from, or have travelled in, other countries. Furthermore, a significant number of health professionals train or practise in countries different from their country of origin.

> *There are some cases in Africa you rarely find in Europe. But as a medical officer, you might need to learn about it .... There is a lot of good stuff in Africa. We have always been crying out that people write our stories for us. In the same regard, we have intellect, we have resources, and we have educational materials that we need to put out there, for people to know the truth about here.*
>
> *Chris Yebuah, OER media specialist, CHS*

Network facilitators

OER Africa is an innovative initiative established by the South African Institute for Distance Education (Saide) to play a leading role in driving the development and use of Open Educational Resources (OER) across all education sectors on the African continent. Established in 1992, Saide's mission is to increase equitable and meaningful access to knowledge, skills, and learning across the African continent, through the adoption of open learning principles and distance education strategies. Saide's recently launched OER Africa initiative brings together all of its OER-related activities under a common conceptual framework. Saide is – through its OER Africa initiative – providing a unique opportunity to deploy African expertise to harness the concept of OER to the benefit of education systems on the continent and around the world.

The University of Michigan (U-M) has a strong tradition of leadership in health science education. The University of Michigan established the first school of scientific medicine on the western frontier in 1850 and quickly became a leading producer of both practitioners and faculty members for other medical schools. Other health sciences programmes were established in the late 19th Century and early 20th Century, leading to the university's current complement of programmes in Medicine, Public Health, Nursing, Dentistry, Pharmacy, Kinesiology, and Social Work. U-M's health professions schools are deeply involved in issues of global health. Building on that legacy and investment, in 2008 U-M launched the university-wide Center for Global Health, which includes open educational resources activities. Across the university there is strong investment in partnerships with African institutions. U-M has one of the strongest collections of health sciences education programmes, deep engagement in cutting-edge informational and educational technologies, and a vision for global service.

Photograph attributions

This case study is one in a series that aims to showcase the Open Educational Resources (OER) programmes at African health science institutions. It is intended for higher education instructional staff and decision-makers on the African continent and overseas. To date, case studies in this series include the University of Malawi, the Kwame Nkrumah University of Science and Technology, the University of Ghana (UG), the University of Cape Town, and the University of the Western Cape.

Each institution in the series was a founding member of the African Health OER Network and has taken steps to open its teaching expertise to the world and develop sustainable institutional health OER initiatives.

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