



United Nations  
Educational, Scientific and  
Cultural Organization



COMMONWEALTH *of* LEARNING

# Open Educational Resources: Policy, Costs and Transformation

Fengchun Miao, Sanjaya Mishra and Rory McGreal  
*Editors*

PERSPECTIVES ON OPEN AND DISTANCE LEARNING





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# **Open Educational Resources: Policy, Costs and Transformation**

Fengchun Miao, Sanjaya Mishra and Rory McGreal  
*Editors*

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## PERSPECTIVES ON OPEN AND DISTANCE LEARNING

*Open Educational Resources: Policy, Costs and Transformation*

Editors: Fengchun Miao, Sanjaya Mishra and Rory McGreal

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# Foreword by the President and CEO, Commonwealth of Learning

The Commonwealth of Learning (COL) is a leader in technology-mediated teaching and learning, and it is mandated by the Commonwealth Heads of Governments to promote distance education knowledge and technologies. In this way, COL has been engaged in promoting the sharing of knowledge resources in Commonwealth countries ever since its establishment in 1987. The STAMP 2000+, a free resource to train school teachers, was developed collaboratively by teachers in eight Southern African countries and was a precursor of Open Educational Resources (OER). The teacher training materials in Science, Technology and Mathematics were opened up for free use by teachers anywhere in the Commonwealth.

Since the early days of STAMP 2000+, COL has been working to promote the development and sharing of quality teaching and learning materials; and, in 2011, it became the first intergovernmental organisation to adopt an open licence policy. In 2012, in collaboration with UNESCO and with the financial support of the William and Flora Hewlett Foundation, COL played a key role in organising the World OER Congress in Paris. That Congress resulted in the OER Paris Declaration, which explicitly urged governments to release, as OER, teaching, learning and research materials developed with public funds as OER.

COL and UNESCO have worked with several governments and educational institutions since the OER Paris Declaration to promote the use and adoption of appropriate OER policies and practices. COL has also published several monographs and reports on OER, in many instances jointly with UNESCO, as a strategy to provide concrete evidence to its various stakeholders on the benefits of adopting OER for improving quality and cutting the costs of education.

The current publication is a continuation of our shared objective of providing thought leadership in this field. It is also part of the joint work plan that UNESCO and COL elaborate every three years. This UNESCO-COL joint publication brings together examples of OER policy development and implementation in various countries where the two organisations are active. This is particularly significant in the context of the need for collaborative engagements to achieve Sustainable Development Goal 4 and the targets outlined in *Education 2030: Framework for Action*.

The editors of the book have identified 15 case studies that document the developments since the 2012 Paris Declaration on OER from the lens of policy, costs and transformation. While national policy development and adoption have been modest, the case studies show the preliminary successes and pitfalls

in changing mindsets from a copyright-only regime to a more flexible and open licence practice.

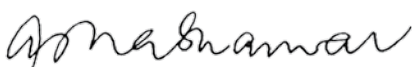
Resistance from publishers, policy-makers and teachers has been identified as a major barrier to adopting OER and we also have examples of how different countries have addressed this challenge. Data relating to costs of OER have been few and far between, but the specific cases discussed in this book indicate the promise of sustainability when a collaborative platform is adopted. The transformational effects of OER in teaching and learning, especially in improving learning outcomes and influencing new pedagogies, have also been identified, as found in the case of Antigua & Barbuda.

Appropriate policy development at national, institutional and project level has been identified as a major driving force for the successful adoption of OER. Several examples in this book depict how a systematic approach to policy development adopted by government has an impact on both policy implementation and capacity building. Grassroots engagements have resulted in huge successes as in Canada, India and, to some extent, Brazil, through provincial legislations. From a policy perspective, we can see the emergence of a legislative route, apart from executive directives. The former might be a better approach to mainstream OER, as policies would be least affected due to political changes in democratic settings. At the institutional level, policy and buy-in at the highest levels lead to the capacity development of teachers.

The case study from the USA provides a framework for an evidence-based approach to promote OER. The international community has recently released a document entitled *Foundations for OER Strategy Development* (<http://www.oerstrategy.org/>), which also resonates with some of the findings of this book.

I take this opportunity to thank all the contributors and the editors for bringing out this important publication. Special thanks to the peer reviewers of the chapters, and colleagues at UNESCO and COL, who have contributed directly or indirectly to make this book a reality. I am sure this volume will inspire many policies and initiatives around the world, and these are critical as we prepare to achieve equitable quality education and lifelong learning for all by 2030.

I invite you to critically analyse the case studies in different contexts, the approaches and the solutions, and to remix and adapt these practices to your own context, in the true spirit of openness and OER.



Professor Asha Kanwar  
President and Chief Executive Officer  
Commonwealth of Learning



# Foreword by the Assistant Director-General for Education, UNESCO

In 2002, the term “Open Educational Resources” (OER) was first coined at UNESCO’s Forum on the Impact of Open Courseware for Higher Education in Developing Countries, sponsored by the William and Flora Hewlett Foundation (Hewlett Foundation). Since then, UNESCO has been promoting the adoption of OER at national and institutional levels with a view to harnessing freely adaptable resources to achieve the Education for All (EFA) Goals. It was within that framework that in 2010 UNESCO jointly launched the initiative “Taking the Open Educational Resources (OER) beyond the OER Community: Policy and Capacity” with the Commonwealth of Learning (COL). The initiative focused mainly on higher education institutions and resulted in the UNESCO-COL joint *Guidelines for OER in Higher Education* developed in 2011. The global movement for OER culminated at the World OER Congress convened in Paris on 20–22 June 2012 by UNESCO, COL and other partners. The resulting Paris OER Declaration (2012) reaffirmed the shared commitment of international organizations, governments, and institutions to promoting the open licensing and free sharing of publicly-funded content, the development of national policies and strategies on OER, capacity-building, and open research.

With the financial support of the Hewlett Foundation, UNESCO and COL have led the operationalization of the 2012 OER Paris Declaration. In that context UNESCO has been organizing regional and national workshops to support Member States in developing national policies for OER. As a result, an increasing number of countries from Africa, Asia and the Gulf States have defined OER policies including in regard to open licensing of educational resources developed with public funds such as textbooks, digital learning materials and teacher training materials.

It is also pertinent to underline the Qingdao Declaration on leveraging ICT to support the Education 2030 agenda, which was adopted at the International Conference on ICT and Post-2015 Education, organized by UNESCO with the support of the People’s Republic of China in May 2015. Among other things, it highlights the fact that OER provide education stakeholders with opportunities to improve the quality of, and expand access to, textbooks and other forms of learning content, to catalyze their innovative use, and to foster knowledge creation. The Qingdao Declaration also attaches importance to developing sector-wide strategies and capacity-building programmes to fully realize the potential of OER to expand access to lifelong learning opportunities and achieve quality education. Along with the Paris 2012 OER Declaration, the Qingdao Declaration opens new perspectives to contribute to access to knowledge for all and to enhance opportunities for quality learning within the vision articulated in Incheon, at the

World Education Forum, and through Sustainable Development Goal 4 (SDG4) and its seven targets.

Despite the potential of OER to expand access to, and to improve the quality of, education, as well as to influence many strategic documents, knowledge concerning effective OER policies and practices remains scarce. This book, *Open Educational Resources: Policy, Costs and Transformation*, is part of a series of joint UNESCO-COL publications which attempt to fill this knowledge gap. It departs from analyzing previous efforts to theoretically define the benefits of OER and to examine the implementation of projects and policies through thematic chapters on policy, costs and transformation. It offers a balanced perspective on OER research and practice. The publication seeks to provide rich case studies of OER from both developed and developing countries, including bottom-up and top-down approaches. While the book puts forward successful case studies, it also presents examples of the limitations of OER practices. Case studies on policies and initiatives selected from Africa, the Arab States, Asia and the Pacific, Europe, North America, and Latin America and the Caribbean document effective approaches to harnessing OER as a means of moving towards the achievement of the SDG4 Education 2030 agenda. These case studies highlight policy issues and lessons relevant to a wide variety of stakeholders, including government officials, school and district administrators, and classroom educators.

UNESCO and COL are sincerely grateful for the contribution made by the authors, who are prominent experts in the field of OER, and to the William and Flora Hewlett Foundation for its financial support.



Dr Qian Tang  
Assistant Director-General for Education  
UNESCO

## Contributors

**Maimoona Al Abri** is the Director of E-Content and E-Learning Department at the Ministry of Education, Sultanate of Oman. Maimoona received her Master's degree in Learning Technology from Griffith University in Australia. Currently she is a PhD candidate in Education in Instructional Design in the USA. She led the development of the OER project in the Oman Ministry of Education, including developing the teacher ICT competency and eLearning project.

**Hala Amer** is Acting Director for RCICT Bahrain. She began her career as a teacher and, in 1997, was promoted to the post of senior teacher. In 2004, she joined the Directorate of Curricula as a specialist for two years. Throughout her work in the field of Education, she has taken an active role in multiple areas, one of which was leading a team on a “Leadership for Outcomes” project. Ms Amer holds a Master's degree in Applied Linguistics and Language Studies, High Diploma in Education and BA in English Literature.

**Terry Anderson** has been a Canadian Research Chair in Distance Education for 10 years. Terry was involved as Principal Researcher in a variety of research and development initiatives, including the Technology Enhanced Knowledge Research Institute (TELRI). He serves as Editor Emeritus of the open access journal *International Review of Research in Open and Distributed Learning* (IRRODL) and he was founder of the Canadian Institute for Distance Education Research (CIDER). He was a principal investigator in the Canada-wide EduSource Pan-Canadian Network of Learning Object Repositories, the Campus Alberta Repository of Education Objects (CAREO) and the Alberta Supernet Research Network. His edited open access book, *The Theory and Practice of Distance Education*, has been downloaded by more than 77,000 users and it is now in its second edition.

**Petra Wiyakti Bodrogini** is an ICT in Education specialist, based in Jakarta, Indonesia. She has been providing technical assistance to the Government of Indonesia through the support of the World Bank, UNESCO and the Asian Development Bank. Under the World Bank's Dutch Education Support Program (DESP), she was involved in an OER initiative in 2012 to assist the Ministry of Education and Culture in an OER pilot for private universities in North Sumatra. In 2014, she supported the Ministry in the ICT-CFT Harnessing OER pilot programme in West Java, supported by UNESCO and the Hewlett Foundation.

**Carina Bossu** is a lecturer (Learning and Teaching) with the Tasmanian Institute of Learning and Teaching (TILT) at the University of Tasmania (UTAS), Australia. Her current work and research are focused on open educational practices in higher education, more specifically issues related to learning, teaching and professional development. Previously, she was a Research Fellow with DEHub at the University of New England (UNE), Australia, where her role was to investigate the use and

adoption of OER across the Australian higher education sector. In 2013, Carina was named the New Researcher “One to Watch” of the year by Routledge Education. She has presented and published widely in this area and is currently involved in several research projects investigating different aspects of open education in higher education in Australia.

**Saif Hamed Hilal Al Busaidi** is Assistant Director of the Department of Communication and Information Sector of the Oman National Commission for UNESCO. He is the member of the national OER team designated to develop the OER policy, including developing the teachers’ ICT competency framework. He has worked in the Ministry of Education in the Sultanate of Oman as a science teacher for 10 years, before moving to the Oman National Commission in 2014.

**Neil Butcher** is based in South Africa. He provides policy, technical advice and support to national and international clients in educational planning, use of educational technology and distance education. He was an employee at the South African Institute for Distance Education (SAIDE) from 1993 to 2001, and is now Director of Neil Butcher & Associates. He has assisted educational institutions with transformation efforts that focus on effectively harnessing the potential of distance education methods, educational technology and OER.

**Oona Castro** holds a Master’s degree in Communications from the Federal University of Rio de Janeiro. Being the head of the Brazil programme of Wikimedia Foundation between 2012 and 2014, she oversaw the development of the research project “Open Educational Resources in Brazil: The Field, the Resources and Their Use in Classroom Activities.” She was also the Executive Director for Instituto Overmundo from 2007 to 2012, managing projects within large communities that produce open knowledge and culture. For over 12 years of her career, she has also promoted and advocated for communications rights, worked with flexible copyright regimes and new business models, and served as a communications officer for government organisations.

**Boyoung Chae** is a Policy Associate of eLearning & Open Education at the Washington State Board for Community and Technical Colleges. She received her PhD in Instructional Technology from the University of Georgia and her Master’s degree in Instructional Systems from the Pennsylvania State University. She led the development of several state-wide OER initiatives, including Open Course Library, How to Use OER, and Open Washington. She also co-authored an OER research report that has been awarded the 2015 Open Research Award for Open Education Excellence, presented by Open Education Consortium.

**Dianne Conrad** has recently retired from her administrative positions at Athabasca University, ending a 33-year career at post-secondary institutions in Canada. In her retirement, she will continue to teach part-time for the Centre for Distance Education, Athabasca University, and engage in project work related to her expertise in adult and distance education, online learning, and prior learning assessment and recognition. Additionally, she continues to serve as co-editor of the *International Review of Research in Open and Distributed Education* (IRRODL), as a journal reviewer, and as a member of several editorial boards of related national and international journals.

**Ulf-Daniel Ehlers** is the Vice-President for Quality and Academic Affairs at the Baden-Württemberg Cooperative State University in Stuttgart, Germany.

He has been appointed Professor for Educational Management and Lifelong Learning at the same university. Previously, he held positions as Associate Professor at Universität Duisburg-Essen, Germany, Professor for Technology Enhanced Learning at the University Augsburg, and Associate Professor of the Graduate School for Management and Technology at the University of Maryland University College. Prof Ehlers is founding member and past President of the European Foundation for Quality in E-Learning (2011–2014), has been President of the Society for Media in Science, and has served on advisory boards to several professional associations in the field.

**Jennifer Glennie** is the founding Director of the South African Institute of Distance Education (SAIDE), a non-profit organisation dedicated to promoting open learning principles and use of quality distance education methods. SAIDE is also increasingly contributing to the development and use of OER and technology in education in Sub-Saharan Africa through a range of projects, including African Storybook, OER Africa and AgShare. Since democracy in South Africa, Jenny has served on numerous education bodies, ministerial committees and task teams, and most recently was appointed by the Minister of Higher Education and Training to chair the governing body establishing Sol Plaatje University in the Northern Cape.

**Sarah Hoosen** is a researcher and project manager at Neil Butcher & Associates, where she works on projects in the higher education area, including institutional strategy development and the evaluation of education and technology. Sarah has published widely on distance education and OER and has a Master's degree in Counselling Psychology.

**Mark Jenkins** is the Director of eLearning & Open Education at the Washington State Board for Community & Technical Colleges (SBCTC). He received his PhD in Literature from the University of California/San Diego. His career has been spent in the field of digital learning and technology as a teacher, faculty support specialist, curriculum designer and administrator at Marylhurst University, Portland State University, and the SBCTC. Since 1999, he has specialised in building organisations to support innovations in adult-focused digital learning. Recently, with his SBCTC colleague and lead researcher, Boyoung Chae, he co-authored an OER research report that was awarded the Open Education Consortium's 2015 Open Research Award for Open Education Excellence.

**Nawal Ebrahim Al Khater** is an Assistant Under-Secretary for Planning and Information in the Bahrain Ministry of Education. She supervises King Hamad's Schools of the Future Project and the Digital Empowerment in Education Project. She is the head of the OER Committee. Nawal received her Master of Business Administration in Project Management from Open University of Malaysia.

**Svetlana Knyazeva** holds a PhD in Information and Library Science and is Chief of the Section of Digital Pedagogy and Learning Materials at the UNESCO Institute of Information Technologies in Education, Moscow. Since 2009, she has been co-ordinating a project on OER in non-English-speaking countries. She has promoted OER through analytical and diagnostic studies, strategic advice and facilitation of professional development related to the use of ICT and OER in teaching and learning. Her research interests cover innovative teaching methods and foresight in ICT in education.

**Mangala Sunder Krishnan** is a Professor of Chemistry at the Indian Institute of Technology (IIT) Madras, in Chennai, India. He obtained his PhD in Theoretical Chemistry from McGill University, Montreal, Canada, in 1988, and has many years of post-doctoral experience in the field of theoretical chemistry. He pursues scientific research in the areas of theoretical molecular and magnetic resonance spectroscopies and computational thermochemistry of large-ring structures. He teaches both general physical chemistry and special topics in core areas of chemical physics. He has been the national Web courses co-ordinator for the National Programme on Technology Enhanced Learning since 2003. The programme is co-ordinated by IIT Madras and has many IITs and Indian Institutes of Science as partners. He is a member of several national committees on e-education/eLearning, set up by India's Ministry of Human Resource Development (MHRD), Agriculture, and Information and Communication Technology. Currently he is a member of several committees working to advance Massive Open Online Courses (MOOCs) in India, formed by the MHRD.

**Teik Kooi Liew** is Director of Quality Assurance and External Relations at the Wawasan Open University (WOU) in 2005 after nearly 10 years of teaching and holding administrative positions in conventional higher educational institutions. He served as the Secretary General of the Asian Association of Open Universities from 2011 to 2013. He is also actively involved in IDRC research projects on Quality Assurance in Distance Education and Impact Studies on OER Differentiation. At the national level, he serves on the panel of assessors for programme accreditation and self-accreditation of institutions under the Malaysian Qualifications Agency. He is also one of the panel of experts that developed the *Guidelines and Good Practices for Accreditation of Prior Experiential Learning* adopted in Malaysia.

**Wayne Mackintosh** is the founding Director of the OER Foundation and one of the thought leaders supporting the implementation of the OER universitas (OERu). He holds the UNESCO and International Council for Open and Distance Education (ICDE) Chair in OER at Otago Polytechnic and the OER Foundation. Formerly, he was Education Specialist for eLearning and ICT Policy at the Commonwealth of Learning (COL). Before joining COL, he was Associate Professor and founding director of the Centre for Flexible and Distance Learning. And before that, he spent 11 years working at the University of South Africa (UNISA), a distance learning institution and one of the world's mega-universities.

**Rory McGreal** is the UNESCO/Commonwealth of Learning/International Council for Open and Distance Education Chair in OER and Director of Technology Enhanced Knowledge Research Institute (TEKRI), Athabasca University. He is also co-editor of the *International Review of Research in Open and Distributed Learning* (IRRODL). Prof McGreal previously served as Associate Vice-President Research at Athabasca University, Director of TeleEducationNB, a Canadian province-wide eLearning network, and supervisor at Contact North in Ontario. He has worked internationally in the Middle East, Seychelles and Europe.

**Fengchun Miao** heads the ICT in Education team in the section for Teacher Development and Education Policies at UNESCO. His main responsibilities are to plan and implement UNESCO's ICT in Education strategy; provide advice to Field Offices that support Member States in areas related to ICT policies for education; design capacity development programmes; and follow up on other strategic initiatives, such as OER and mobile learning. From 2006 to 2010, he worked in

UNESCO Bangkok as the Programme Specialist of ICT and Education and the Chief of ICT in the Education Unit. In these capacities, he worked with partners from more than 30 countries and completed a wide variety of tasks, such as facilitating ministerial debates, providing in-depth diagnostic studies and strategic advice, building the capacity of policy-makers, strengthening the institutional capacity of teacher training colleges, and documenting the effectiveness of ICT in teaching and learning processes.

**Sanjaya Mishra** became Education Specialist – eLearning on 2 January 2015. He served the Commonwealth of Learning as Director of the Commonwealth Educational Media Centre for Asia (CEMCA) from 1 July 2012 to 31 December 2014. Dr Mishra is one of the leading scholars in open, distance and online learning. Most recently, he was Programme Specialist (ICT in Education, Science and Culture) at UNESCO, Paris. He has over 20 years of experience in design, development and management of ODL programmes. With a blend of academic and professional qualifications in library and information science, distance education, television production and training and development, he has been promoting the use of educational multimedia, eLearning, OER and open access to scientific information around the world. Among many innovative activities and programmes he undertook during his service in various capacities at the Indira Gandhi National Open University (IGNOU), he developed the successful one-year, OER-based Post-Graduate Diploma in eLearning.

**Andrew Moore** is an author, materials developer, instructional designer, Web interface designer and educational technology trainer at Neil Butcher & Associates. He manages projects designed to provide capacity to staff at African higher education institutions in designing, developing and deploying eLearning solutions, as well as projects providing capacity to courseware developers across the continent in identifying, adapting and sharing OER. Andrew has a Master of Education degree from the University of Pretoria (2002).

**Mohammad Rinaldi** is a lecturer, instructional designer and learning technologist at the Faculty of Education, USBI, Jakarta, Indonesia. He currently serves as co-ordinator of curriculum delivery and professional development at the university's Centre for Learning, Teaching and Curriculum Development. His research interests include the use of technology in education, open courseware, OER, learning design and emerging technologies, educational technology research and evaluation, and student engagement.

**Carolina Rossini** is a Brazilian lawyer with over 15 years of experience in Internet and intellectual property law and policy. She has worked with Open Access and OER for a decade and founded the OER-Brazil project in 2008, aimed at supporting the development of OER policies, practices and communities in Brazil. She currently serves as the Vice-President for International Policy at Public Knowledge, a digital and consumer rights advocacy group based in Washington, DC. She also sits on the Advisory Boards of the Open Knowledge Foundation for the UK and Brazil, Instituto Educadigital and InternetLab.

**Aleksei Sigalov** has been active in ICT use in education for over two decades. He obtained his university diploma in Physics and his PhD thesis dealt with numerical modelling of heat transfer. From 1983 to 1996, he taught at the St. Petersburg State University of Information Technologies, Mechanics and Optics.

He was involved in the development of the university computer network RUNNet. From 1998 to 2002, he co-ordinated Internet projects at the St. Petersburg Branch of the Open Society Institute (Soros Foundation). He was involved in the development and maintenance of informational and educational portals such as “Single-Entry Window” and “ICT in Education.” Since 2003 he has been the Deputy Director of the St. Petersburg Branch of the State Institute of Information Technologies and Telecommunications “Informika.”

**Fadheela Tallaq** is an Educational Supervision Specialist at the Directorate of Educational Supervision in Bahrain. She is a graduate of Design and Technology from the University of Sunderland, the UK. Being a member of the OER Committee, she participated in designing the OER policy and in following its implementation.

**Alek Tarkowski** is Director of Centrum Cyfrowe Projekt: Polska, a “think-and-do-tank” that is building a digital civic society in Poland. He also works as a Commons Europe Policy Fellow at the Public Lead of Creative Commons Poland, the Polish branch of the global organisation promoting flexible copyright models for creators. Dr Tarkowski is a member of the Polish Board of Digitisation, an advisory body to the Ministry of Administration and Digitisation, in which he co-ordinates the working group on digital competences. He is President of Communia, a European association supporting the digital public domain, and Vice-Chairman and co-founder of the Polish Coalition for Open Education (KOED). He served as a member of the Board of Strategic Advisors to the Prime Minister of Poland from 2007 to 2011, and was responsible for issues related to the development of digital society. Since 2010, he has been actively involved in policy debates on OER, both in Poland and in Europe, including the planning and implementation of the Polish e-textbooks programme.

**Tessa Welch**, a senior programme specialist at the South African Institute of Distance Education (SAIDE), has been responsible for building its innovative African Storybook Initiative from inception in 2012. Previously, as the leader of SAIDE’s teacher education strategy, Tessa worked with the national Department of Education on teacher education policy and upgrading, and with institutions such as the University of Pretoria and University of South Africa in evaluation and professional development for distance education design and delivery. She developed a set of quality criteria and case studies for the National Association of Distance Education and Open Learning in South Africa (NADEOSA), and was project leader for a Hewlett Foundation funded project to stimulate the creation, use and sharing of OER for teacher education in Africa.



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# Introduction

## Open Educational Resources: Policy, Costs and Transformation

*Rory McGreal, Fengchun Miao and Sanjaya Mishra*

### Background

The Open Educational Resources (OER) movement has grown substantially since the term was first adopted at UNESCO's 2002 *Forum on the Impact of Open Courseware for Higher Education in Developing Countries* (UNESCO, 2002). Since then, there has been a significant increase in the development, use and sharing of OER as more and more governments and institutions come to realise their value. OER can be defined as teaching and learning resources in any medium, digital or otherwise, that permit no-cost access, use, reuse and repurposing by others with no or limited restrictions (Cape Town Declaration, 2007; UNESCO, 2012; Creative Commons, n.d. a; William and Flora Hewlett Foundation, n.d.).

Freely available educational resources are not necessarily OER. Many educational resources made available on the Internet are geared to allowing online access to digitised educational content, but the materials themselves are restrictively licensed. Often, this is not intentional. Educators are generally not familiar with copyright law in their own jurisdictions, never mind internationally. International law and national laws of nearly all nations, and certainly of all those who have signed onto the World Intellectual Property Organization (WIPO), restrict all content under strict copyright (unless the copyright owner specifically releases it under an open licence). In order for educational resources to be OER, they must have an open licence. The Creative Commons licence is the most widely used licensing framework internationally used for OER.

Institutions and countries have their own specific reasons for initiating OER projects. Although the idea of using cost-free resources is commonly supported, there are other motives. Among them are the permissions that allow educators to adapt and repurpose the content, especially the ability to localise the materials to make them relevant to an instructor's or an institution's particular context and

culture. As low-cost tablet computers and other mobile devices (phablets) become more widely available even in developing countries, easy access to online content is becoming ubiquitous. However, for many people, continuous Internet access is problematic and so the need to download content is a significant concern. This is not legally (or, often, technically) possible with restrictively licensed content. OER provide educators and students with the possibility to both download the content to their devices and reuse and adapt it to suit their needs.

Another motive for adopting OER is to enhance access to educational opportunities, informal and formal. While many learners cannot access learning through the normal onsite traditional learning processes, lifelong learning opportunities for citizens are becoming essential for supporting modern economies. If the goal of inclusive and equitable education and lifelong learning for all is to be achieved, alternative and innovative means must be harnessed to expand the access to lifelong learning opportunities in all settings and at all levels of education (UNESCO, 2015a). OER hold the potential to address this lack of access, permitting anyone, anywhere, at any time, to access learning content and do so more affordably.

Students support OER, especially open textbooks, because OER in digital format are accessed at no cost and print copies are also available at relatively low cost. Commercial textbooks have become very expensive and unaffordable. But, besides OER as textbooks, they are also valued as supplementary content and as a means of accessing content before a course starts or after students leave (Coffin, 2012).

Obstacles and limitations have also unfolded as the adoption of OER goes ahead. While some OER proponents have identified copyright and the opposition of publishers as significant impediments to the growth of OER initiatives, others believe that overly strict interpretations of copyright have provided an impetus to OER growth. This occurs when the restrictions on use become onerous and so make switching to OER more attractive. In addition, publishers who are lobbying decision-makers to oppose OER (and are thus maintaining the high cost of their textbooks) can also be seen as providing an impetus. As textbook prices increase, the benefits of OER become more readily apparent. In many countries, connectivity is seen as an obstacle to OER growth, but again, the ability to download the OER and host the content on a mobile device is a major advantage that OER have over commercial content.

On the other hand, the lack of knowledge about OER and copyright does play a major role in limiting OER growth. There is a strong need for more dissemination of knowledge about OER and open licensing and their potential to transform education. Knowledge needs to be followed with opportunities for training on searching, assembling and adapting OER. But even this is problematic in regions with low literacy and digital literacy rates. The lack of available technology has also been identified as a major problem, but with the growing availability of inexpensive, powerful mobile devices, the problem is lessening even in the least developed countries.

Global communities of education — including the Commonwealth of Learning (COL) and UNESCO — recognise that education is foundational to achieving the 2030 sustainable social and economic development goals (UNESCO, 2015a). OER have an important role in the wider context of sustainable development agendas.

OER provide education stakeholders with opportunities to: improve the quality of, and expand access to, textbooks and other forms of learning content; catalyse the innovative use of content; and foster knowledge creation (UNESCO, 2015b).

OER can be used to better prepare students to thrive in the dynamic, knowledge economies that are characteristic of the 21st century. Due to their flexibility, OER can help to facilitate positive change in the education sector, ensuring that the knowledge and skills taught are up-to-date, relevant and accessible to target audiences. Moreover, OER can contribute to making education more equitable by supporting the assembly, creation and dissemination of high-quality reusable, affordable resources.

Despite the considerable potential of OER to improve education and expand its reach, Glennie, Harley and Butcher (2012) rightly observed that “many of the important questions concerning actual OER practice remain unanswered.” COL and UNESCO have helped to fill this knowledge gap with a series of publications that describes OER practice in different contexts (Dhanarajan & Porter, 2013; Glennie et al., 2012; Kawachi, 2014; McGreal et al., 2013).

This book represents a continuation of these works. It differs from previous efforts, however, by examining specific OER implementations through different lenses. The various chapters illuminate OER not from a theoretical perspective, but from rich case studies of OER as they are unfolding in different regions. The different units highlight policy issues and lessons relevant to a wide variety of stakeholders, including government decision-makers, education officials, post-secondary leaders, school and district administrators, and instructors and teachers.

Three issues are focused on in this book: policy, costs and transformation. While the chapters are sequenced alphabetically as per the country of the case discussed, they focus on a specific thematic issue, ensuring that the distinctiveness of different OER implementations comes to the fore, while resting within the confines of a set analytical framework. Each chapter is based on a relatively consistent structure that helps readers compare and assess the information as it is presented. Educational reform occurs in particular contexts, with unique characteristics and limitations, and the contributions serve to explore how these contexts influence OER in the different thematic domains.

The three recurrent themes that constitute the body of the publication provide examples of positive OER change, and they do not ignore failure or mince words about limitations. These case studies, within the thematic sections, provide an objective accounting of how particular OER efforts are proceeding. These provide a balanced perspective representing OER research and practice. The case studies highlight initiatives in both developed and developing country contexts.

The themes are discussed further below.

## **Policy**

Policy is related to the establishment of priorities for supporting the decisions made by an institution or organisation. Policies can serve administrative, financial, political or other goals. OER policies are generally those that support the assembly, use and reuse of OER in an institution or within a jurisdiction. The Creative Commons (n.d. b) has established an OER policy registry that, as of November

2015, included more than 70 policies. COL adopted an OER policy in 2011, while UNESCO adopted an open access policy in 2013. Both COL and UNESCO are in the forefront of advocating and promoting OER around the world. Open access policies are also becoming part of the development strategy of several funding agencies and foundations, such as the Hewlett Foundation and Wellcome Trust. As well, several national OER policies have also been adopted, including the one by Antigua & Barbuda that includes open licensing in its ICT in Education Policy. Besides, project-level OER policy is also emerging, as in the case of the National Mission on Education through ICTs (NMEICT) in India, discussed in Chapter 7.

POERUP (Policies for OER Uptake) is a recently completed European project to develop policy recommendations for use by decision-makers in institutions and government (POERUP, n.d.). More than 500 selected OER initiatives have been documented in a database and on an OER interactive map. The project identified the lack of policies, models and frameworks as key barriers to OER adoption, with few countries having a defined OER policy. There has also been little research on the effectiveness of policies that have been adopted. Policy-makers need good research on successful (and unsuccessful) policy implementations in order to assess the effectiveness of different OER projects and to discover gaps between policy and practice. Critical determinants of success — such as sharing, funding, capacity building, and regulation setting — should be addressed through relevant policies. These should include incentives, monitoring and assessment mechanisms.

Policy can be seen as an essential indicator of OER practice. COL and UNESCO, with funding support from the William and Flora Hewlett Foundation, have been working actively to advance the development of national and institutional OER policies. These case studies explore:

- How has policy shaped or kick-started different OER initiatives?
- How were various policy environments developed and led?
- In what ways did policy facilitate (or, conversely, inhibit) OER practice?
- Did policy actually presage change, or was there an external impetus?
- Did OER practice result from top-down prescriptions/guidance or did it emerge through ground-up efforts?
- What lessons can be extrapolated?
- Have any OER implementations occurred without policies?

## **Costs**

Funding is generally related to policy. This theme explores the funding of OER, specifically in terms of cost-effectiveness. One of the most frequently cited benefits of OER is their potential to reduce costs (Bliss, Hilton, Wiley, & Thanos, 2013; Millard, 2014; OpenStax College, 2014; Wiley, Hilton, Ellington, & Hall, 2012). While OER seem well placed to bring down total expenditures, they are not cost-free. New OER can be assembled or simply reused or repurposed from existing open resources. This is a primary strength of OER and, as such, can produce major cost savings. OER need not be created from scratch. On the other hand, there are some costs in the assembly and adaptation process. And some OER must be

created and produced originally at some time. While OER must be hosted and disseminated, and some require funding, OER development can take different routes, such as creation, adoption, adaptation and curation.

Each of these models provides different cost structure and degree of cost-efficiency. Upfront costs in developing the OER infrastructure can be expensive, such as building the OER infrastructure. Butcher and Hoosen (2012a, p. 6) noted that “a key argument put forward by those who have written about the potential benefits of OER relates to its potential for saving cost or, at least, creating significant economic efficiencies. However, to date there has been limited presentation of concrete data to back up this assertion, which reduces the effectiveness of such arguments and opens the OER movement to justified academic criticism.”

This knowledge gap is addressed in several chapters in the book, and provides concrete evidence of how OER can help governments rein in expenses. For each particular case, how is the OER initiative funded? What are the long-term objectives (if any) related to OER assembly, reuse, production and dissemination, and how does funding reflect these objectives? In terms of funding, how can an initiative be sustained?

## **Transformation**

The potential for OER to contribute to the transformation of teaching and learning has been posited by several OER proponents (Gunness, 2012; Iiyoshi & Kumar, 2008; Neil Butcher & Associates, 2014; Wheeler & Osborne, 2012), but do we have evidence of this transformation? Does the ability to reuse, re-mix and revise educational resources spark changes in pedagogy? Should expectations be more modest and more tightly focused on issues of assembly, production and dissemination rather than holistic change? Does the discourse around OER and educational transformation need to be reoriented? Each case study in this theme addresses how OER adoption and practice can initiate pedagogical change if not bona fide transformation. This section provides examples that demonstrate how OER can be used in ways that go beyond replication of current teaching and learning models.

In supporting transformation towards openness, Weller (2014) pointed out that scarcity of knowledge has been the basis for our existing teaching models. For example, the classroom model, based on lectures and discussions, came about because there was only one manuscript available. The present cornucopia of knowledge now available on the Internet changes this assumption. In addressing this abundance, Weller posits the idea of a pedagogy of openness and connectedness using social learning applications, including blogs, chat, discussion forums, wikis and group assignments. Having all students contribute something benefits all the participants.

While the discourse of OER has been focusing on reduction of cost and increasing access, there is an underlying assumption about quality of OER due to the inherent openness of the educational materials and the ability of the others to improve quality of an existing material with open licence without re-inventing the wheel. OER supporters have emphasised the importance of quality for successful implementations (D’Antoni, 2007; Manouselis, Pawlowski & Clements, 2014; Schuwer, 2012). Of course, the educators making use or reuse of OER are

themselves probably the best ones to ascertain the quality of a particular resource. Still, learners who access OER individually are not always knowledgeable enough to assess the accuracy or relevance of the learning resources they access. And instructors, who have had minimal or no teacher training, are often not able to assess the pedagogical effectiveness. So, there is a need for ways of assessing and certifying the quality of OER. This can be done through peer-assessment, or by relying on the reputation of the institution that hosts the content.

Another means of assessing quality is by depending on “crowd-sourcing,” wherein quality can be discerned if many people are deciding to make use of a particular resource (Yuan, MacNeill, & Kraan, 2008). Elias, Quirk, and Richards (2008) have suggested other quality criteria, such as content accuracy, presentation design, level of openness, resource size, use of technology, and “findability.”

On the other hand, OER non-supporters like publishers, some educators and others claim that OER, by virtue of their malleability, are not sufficiently controlled for quality. Kortemeyer (2013) argues that quality control “has traditionally been the forte of publishing companies,” saying that the companies thoroughly edit and fact-check the content prior to publication. He claims that OER are disadvantaged because they lack these experienced editorial/publishing personnel. He further argues that peer review, while good, is simply not scalable. COL’s regional office in New Delhi — the Commonwealth Educational Media Centre for Asia (CEMCA) — has developed the TIPS (Teaching, Information, Presentation and Systems) framework for quality assurance of OER (Kawachi, 2014; Mishra & Kanwar, 2015). The TIPS framework advocates for both quality assurance at the time of development of OER and also rating by the end users using the 18 criteria suitable to their contexts. Thus, it allows a lens to every user to decide quality based on what is “fit for purpose.”

In this book, quality issues have not been explicitly discussed. However, authors make reference to the need for quality of OER and how OER projects have been initiated to improve quality of teaching and learning.

There are 15 chapters in this book, contributed by 27 scholars from the Northern and Southern Hemispheres and from developed and developing countries. We have contributions from major OER-producing countries and also from new players in the areas such as Bahrain and Oman. The geographical spread of the contributors presents to us diverse contexts of the use of OER for reduction of costs and transformation of teaching and learning environments. The chapters give us insights into the OER policy development perspective, and how OER projects have emerged at the grassroots and move towards sustainable financing models. The chapters also show impact on transformation of teaching and learning. Some also present the challenges for policy development and barriers to implement OER by highlighting how institutions are mobilising teachers to engage in the OER movement to mainstream OER.

## **Overview of the Chapters**

In *Chapter 1*, Carina Bossu presents the scenario of Open Educational Practices (OEP) in Australia which has expanded in the recent past, influencing and impacting institutions in several aspects, including collaboration, resources and infrastructure development and open policies. While Australia has as open



licensing framework for public-funded information, and several institutions there have adopted OER, the author considers that copyright poses a great challenge to reap the impact of open content development, including MOOCs.

Bahrain is one of the countries that have recently adopted OER to improve the quality of teaching and learning in the country. In *Chapter 2*, Nawal Ebrahim Al Khater, Hala Amer and Fadheela Tallaq describe the educational challenges faced by Bahrain and how OER are expected to address these — especially the ineffective practice of student-centred learning, the shortage of Arabic educational materials, and the lack of lifelong learning opportunities.

In *Chapter 3*, Carolina Rossini and Oona Castro present a grassroots story of OER policy development and practice in Brazil as a rights-centred multi-stakeholder process, where policy is being developed at both the national and provincial level. The authors also discuss how communities are developing OER projects at the local level to increase access to educational materials.

*Chapter 4* is reproduced from the *International Review of Research in Open and Distributed Distance Learning* (IRRODL). In it, Rory McGreal, Terry Anderson and Dianne Conrad describe the development of OER and MOOCs in Canada. The chapter highlights the depth of the OER movement and progress as exemplified through pan-Canadian, provincial and institutional initiatives for OER. Canada presents a unique case of having several initiatives for OER but no national policy, as education in Canada is a provincial subject. The Council of Ministers of Education, Canada (CMEC), however, has endorsed the 2012 Paris OER Declaration.

*Chapter 5*, by Neil Butcher, Andrew Moore and Sarah Hoosen, presents Antigua & Barbuda's model of ICT in Education Policy development (which incorporates a strong component of open licence) and explains how the Caribbean OER project was initiated within the framework of the implementation plan for the ICT in Education Policy. The deployment of an OER Virtual Learning Environment (VLE) prototype and the compilation of an online mathematics “textbook” from available quality OER are both discussed. The authors highlight different kinds of systemic actions needed to build sustained pressure for long-term, educationally effective change while implementing OER projects.

In *Chapter 6*, Ulf-Daniel Ehlers presents an interesting discourse on the how OER are perceived in Germany. Though OER was not a priority for Germany in 2012, several OER projects are now underway in the country. Open access is widely supported, but OER are not popular because German academics see the resources as not innovative. Access to textbooks is also not a problem in Germany, and with the recent free university education policy, it is quite clear that institutions are now moving towards Open Educational Practices.

In *Chapter 7*, Mangala Sunder Krishnan describes how one of the biggest OER repositories in the world was initiated and adopted open licensing. India's National Programme on Technology Enhanced Learning proceeded with content development by experts, using the support of public funds and taking a cautious, slow and incremental approach to convince the faculty to adopt OER.

In *Chapter 8*, Petra Wiyakti Bodrogini and Mohammad Rinaldi discuss OER developments in Indonesia since 2012. Interestingly, the *Higher Education Act of 2012* in Indonesia stipulates that governments must develop “open

learning resources.” This is widely accepted as a policy for OER, although it does not necessarily indicate any open licence framework. Nevertheless, there are substantial numbers of OER projects, including materials released by the University of Terbuka and the Ministry of Education and Culture.

The case of use of OER at Wawasan Open University (WOU) in Malaysia is discussed in detail in *Chapter 9*, by Teik Kooi Liew. To adopt an economically sustainable option for course development and delivery as an answer to delayed course development for open education, WOU made a transition to use OER and developed a policy for using OER in developing teaching and learning material. This chapter demonstrates how internal quality control mechanisms can help the OER development process meet the requirements of a quality assurance agency and also provide relative cost-efficiency.

In *Chapter 10*, Wayne Macintosh presents the incremental design and disaggregated service approach of the OER universitas (OERu), and how the consortium is gearing towards financial sustainability. He concludes that the success of the OERu model is based on adopting open sources, respecting partner autonomy to offer courses and programmes, providing value for all the stakeholders, and creating an open ecosystem to foster OER projects.

*Chapter 11* is about Oman, where OER policy was developed in 2013. Maimoona Al Abri and Saif Hamed Hilal Al Busaidi discuss the strategy to develop and implement the policy. While it is still in implementation stage, significant to note is the systematic collaborative process between the Ministry of Education and UNESCO to engage with the stakeholders to develop policy to improve teaching and learning.

In *Chapter 12*, Alek Tarkowski reviews the OER developments in Poland, a country with a fair amount of ICT penetration in schools. The Digital School programme discussed presents the ecosystem of school education textbooks, and describes how the publishing lobby opposed the open textbook initiative of the Polish government.

Svetlana Knyazeva and Aleksei Sigalov in *Chapter 13* present a detailed overview of OER in Russia, which has a legal provision for open licence introduced in the copyright law in 2014. That law also describes the public perception that anything that is freely available could be “used for educational purposes and treated as OER.” The authors describe the initiatives of the Ministry of Education and Science (MES) of the Russian Federation to be that of supporting production of educational resources with open licences. The MES also organises annual events to promote the use of OER. As well, several initiatives in Russia promote MOOCs.

*Chapter 14* focuses on an early childhood language development project in local languages in Kenya, South Africa, Lesotho and Uganda. As Tessa Welch and Jennifer Glennie explain, the African Storybook project promotes development and translation of stories in local languages, and helps keep the languages culturally and linguistically alive. The production cost of the storybooks in local languages turns out to be less than USD 1, and learners have shown multilingual capabilities. Because the contents are available with open licence, it is easy to translate and adapt the stories to local contexts by changing the illustrations and diagrams.

Chapter 15 presents the systematic strategy to OER adoption in the Washington Community and Technical Colleges System. Alignment of goals for student success with OER advocacy, along with the development of a strategic plan for policy development, led to identification, funding, design and development of OER projects. Boyoung Chae and Mark Jenkins present a framework for research and policy to support open initiatives. This is a generic model that can be adapted by any institution developing and promoting OER.

A brief analysis of the chapters and lessons learned is presented by the book's editors in the Conclusions section at the end.

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# Open Educational Practices in Australia

*Carina Bossu*

## Abstract

This case study presents the extent of transformation that Open Educational Practices (OEP) have brought to higher education in Australia. In the early stages of the transformation, open access policies, funding, support and infrastructure were introduced by the national government. Initiatives that uncovered the transformative potential of OEP were then undertaken. The scope of transformation of OEP in Australia has since expanded, influencing and impacting institutions in several aspects, leading the sector to a better position worldwide. However, many challenges still remain. Restrictive copyright regimes and a lack of national and institutional policies and funding are among the barriers faced by OEP in Australia. If these barriers are removed and policy enablers are further developed, the higher education sector in Australia could fully benefit from the transformative potential of OEP.

## Introduction

Openness has already transformed education at all levels around the world. In higher education more specifically, it has benefited learners and educators and influenced the way universities' senior executives approach institutional strategic plans and policies.

Openness has affected nation-wide research policy and funding. It has shaken established university business models and influenced the development of new ones. It has brought national leaders together to discuss how the wealthier nations could assist the less advantaged ones to increase access to free and open education. As Weller (2014) poignantly states, "Openness affects all aspects of higher education" (p. 2). However, it has not yet won all battles to reach mainstream education.

Openness itself has gone through transformations as the “open” movement evolved to respond to the needs of different technologies, groups and communities. Particularly in education, where the concepts of openness and sharing have long existed, the principles of “open” were adopted by open universities almost a century ago to represent “learning ‘anywhere, anytime’ and open entry and exit points, which were the foundations of open universities and their correspondence and distance education models” (James & Bossu, 2014, p. 81).

Currently, there is a wide range of open approaches and movements to open up education. These approaches include open access (research and data), open learning design, open policies, Open Educational Resources (OER), Open Educational Practices (OEP) and, more recently, Massive Open Online Courses (MOOCs) (Butcher & Hoosen, 2014).

This chapter focuses primarily on OEP in higher education in Australia. According to the Open Education Quality Initiative (2011, p. 12):

“OEP are defined as practices which support the (re)use and production of OER through institutional policies, promote innovative pedagogical models, and respect and empower learners as co-producers on their lifelong learning path. OEP address the whole OER governance community: policymakers, managers/ administrators of organisations, educational professionals and learners.”

Higher education in Australia is a relatively small sector compared with that in some other developed countries: it is made up of 40 full universities and about 130 other higher education providers. However, it plays an important role in the Australian economy, with revenues exceeding AUD 27 billion in 2013 (Norton & Cherastidtham, 2014). As in other higher education sectors worldwide, the Australian sector is expanding. There are about 1.3 million students currently enrolled in the higher education sector across a whole range of degrees, including postgraduate degrees, diplomas, certificates and bachelor degrees. This number also includes on- and off-campus<sup>1</sup> domestic and international students (Norton & Cherastidtham, 2014).

Nevertheless, formal higher education still does not reach all students wanting to pursue it — those who live in rural and remote areas and those from low socio-economic backgrounds, including indigenous people (Bossu, Bull, & Brown, 2012). Another issue affecting participation in higher education in Australia is the high cost of tuition fees, as Australian higher education has one of the top three most expensive tuition fees in the world on average, according to the *Education Indicators in Focus* published by the Organisation for Economic Co-operation and Development (OECD) in 2012 (OECD, 2012). OEP is one of the solutions not only for those excluded from formal education in Australia, but also for those wanting to pursue additional professional development and for lifelong learners.

This case study presents the extent of the transformation that OEP has brought to higher education in Australia. It starts with the early stages of transformation, where open access policies, funding, support and infrastructure were introduced by the Australian government, which followed an international trend. It then

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<sup>1</sup> In Australia, off-campus students are those enrolled and studying via distance education or blended mode.



presents some initiatives that uncovered the transformative potential of open education. The scope of transformation is then discussed, followed by some final considerations.

## **OEP in Australia: The Early Stages of Transformation**

In Australia, OEP started around 1998, when some of the first open access initiatives were introduced and supported by the Australian government (Picasso & Phelan, 2014). But it was in 2002 that the open access movement had a substantial boost due to a programme funded by the Australian government called “Backing Australia’s Ability” (Shipp, 2006, p. 170). This programme was aimed broadly at promoting excellence in research, science and technology, but several initiatives attached to this programme played important roles in the progress of open access in Australia. They assisted in: raising awareness about open access; building research information infrastructure, including university repositories of open data, thesis and other digital objects; establishing metadata standards to improve access and discoverability of research information; and developing related guidelines (Shipp, 2006).

For several reasons, including lack of funding or simply the completion of such initiatives, none of these initiatives are currently active. Instead, other initiatives were created, so that open access continued evolving and progressing in Australia. In 2008, the Australian National Data Service (ANDS) was created and it is currently “the major government funded initiative to provide the infrastructure necessary to support an open data environment” (Picasso & Phelan, 2014, p. 128). ANDS is a large database containing research resources from educational and research institutions in Australia. One of the aims of ANDS is to create an Australian Research Data Commons, where research information can be easily accessible to all (Australian National Data Service, 2014).

In addition, the Australian government and its agencies have also engaged with open access mostly through three different initiatives:

- **Australian Government Policy on Open Source Software** – This initiative also includes the Guide to Open Source Software for Australian Government Agencies. Together these aim to encourage government agencies specifically, and the wider community in general, to consider open source software options as an alternative to proprietary ones (Commonwealth of Australia, 2011b).
- **Government 2.0** – This initiative is not only about making government documents available to the public under an open licence, but, according to the government, represents government support for openness through informing and engaging the public to work in collaboration with the government in a diverse range of activities, using social media, crowd sourcing and other forms of collaboration (Commonwealth of Australia, 2011a).
- **Australian Government Open Access and Licensing Framework (AusGOAL)** – This is essentially a “copyright management framework” with the aim to support and facilitate open access of government and related sectors publicly funded information (AusGOAL, 2011).

Although the government-focused initiatives noted above are not directly related to opening up Australian education, they certainly demonstrate the government's commitment to transparency, sharing of information, and open access to publicly funded resources. This commitment is also a strong example for other publicly funded organisations, such as higher education institutions, to follow.

Today, most Australian universities have an open access repository where thesis, research data and outputs from government-funded projects and initiatives are made available, typically using open licences, including Creative Commons licences, for other researchers to use and re-use (Picasso & Phelan, 2014). In addition, major research-funding bodies have also responded positively to the government position on open access and have encouraged these practices through their own regulations (Picasso & Phelan, 2014).

These developments at the national level have certainly advanced open access in Australia. The initiatives are also on par with open access developments taking place in other regions around the world, for example, in the UK, the U.S., Canada and some European countries. However, they are mostly concentrated on government agencies, as well as related to research data and outputs, and not focused on opening up education through openly licensed educational resources and practices.

In fact, at the time of this writing, Australia does not have a specific programme, framework, policy or regulation of any form that supports the adoption of OER and practices in higher education (Bossu, Brown, & Bull, 2011, 2014a; Bossu et al., 2012).

Despite this reality, there were some early OER-related developments in higher education in Australia, most of which were small and institutional-based projects. Later on, a few projects were then funded by the Australian government Office for Learning and Teaching, which is the main funding body for learning and teaching in higher education in Australia (see Bossu et al., 2014a, for a list of previous OER-related projects). The Office for Learning and Teaching, as with other major Australian funding bodies, also requires that all resources produced during the life of the projects be licensed as Creative Commons Attribution-ShareAlike (CC BY-SA). Current projects investigating OEP and OER in Australia and their impact on assisting the transformation in higher education are discussed later in this chapter.

It is important to highlight that the adoption of open content in Australia was first initiated by both the Vocational Education and Training (VET) and schools sectors more than a decade ago (Browne, 2009). There were several initiatives supported by national and state governments, but recent reforms in the VET and schools sectors meant that most of these initiatives are now discontinued or were completed. Even though Browne (2009) argues that past and present initiatives at VET and school levels do not qualify as open education but as “free for education,” these initiatives played fundamental roles in the progress of the use of open content in Australian education.

## **Transformation of OEP Realised in Australia**

Although the opportunities and benefits of OEP have been realised by the Australian government through investments in open access and by the VET and schools sectors, it was only in 2010 — almost 10 years after the movement emerged

in other parts of the world (i.e., the MIT OpenCourseWare Consortium in 2001) — that it started getting more popular in higher education.

It was during this period that the Office for Learning and Teaching funded a two-year research project, which resulted in the report *Adoption, Use and Management of Open Educational Resources in Australia Higher Education* (Bossu et al., 2014a).

This was an important project for the progress of OER in Australia because it represented the recognition by the Australian government that investigation in this new and underexplored field needed to be conducted in Australia. It was also a great opportunity for the researchers involved in this project to uncover the state of play about OER across the country (Bossu et al., 2014a).

One of the main deliverables of this project was the “Feasibility Protocol for OER and OEP” (Bossu, Brown, & Bull, 2014b), which is a set of guiding principles that prompts questions and raises issues to be considered by educational institutions wishing to experiment with OER and OEP. The protocol attempts to assist higher education leaders to make informed decisions about the adoption of OER and OEP at several levels within the institution, from management to individuals, including academics and students (Bossu et al., 2014b). The Feasibility Protocol addresses four topics: the *opportunities* that OER and OEP could bring to institutions and broader society; the *challenges* associated with OER and OEP adoption; considerations surrounding the institutions’ *strategic directions* for an effective adoption of OER and OEP; and *policy recommendations* for higher education institutions in Australia (Bossu et al., 2014b).

This project also revealed that most respondents were aware of the OER movement, and rated their knowledge of OER as intermediate. However, the majority of participants had either rarely or never used OER. For those who had used OER, learning objects were the most preferred type. Encouragingly, a large number of participants stated that they would like to be more involved in OER activities. One reason participants were not engaged with OER could have been the lack of institutional strategies and policies to support OER projects and initiatives at that time (Bossu et al., 2014a).

Another contribution of the two-year research project in helping the sector realise the opportunities of OER for higher education in Australia was the organisation of the first National Symposium on OER, held in August 2012 in Sydney. A range of stakeholders representing 21 national and international institutions (including higher educational institutions, VET and government bodies) attended the symposium. The symposium was a key dissemination strategy for this project, and a chance for the stakeholders to meet and discuss issues related to open education, opportunities for collaboration, and ways to together overcome some of these concerns (Bossu et al., 2014a).

An outcome of the project was also the realisation that much more needs to be done for Australia to fully benefit from OER and OEP. Several new initiatives have thus emerged, including those with national and international institutions. Some of these initiatives are externally funded, some are internally funded, and still others have not received any funding but are progressing nonetheless. A range of these OEP initiatives is discussed in the next section.

## Scope of Transformation of OEP in Australia

The scope of the transformation of OEP in Australia is best understood by looking at the main initiatives, programmes and activities categorised into five themes: collaboration; resources and infrastructure; open policies; learning and teaching; and research. This is by no means an exhaustive list of activities being undertaken in Australia, but it is a useful way to assess the contemporary context.

- **Collaboration** – Australian higher education is very competitive. Institutions compete for students, for government funding and for rankings. Interestingly, some Australian open-education advocates have realised that one of the key strategies to succeed in open education is to collaborate with others. Collaboration amongst institutions and countries has already been recognised as one of the opportunities of the transformative potential of open education (Commonwealth of Learning, 2011).

An example of this collaboration is the OERu, which is a consortium of currently 39 international educational institution partners, spread across five continents. In Australia, six universities are part of this network: University of Canberra, University of Southern Queensland, University of Wollongong, Charles Sturt University, Curtin University and the University of Tasmania. The OERu's vision is to make education accessible to everyone. Co-ordinated by the OER Foundation, it is an independent, not-for-profit network that offers free online courses for students worldwide. It also provides affordable ways for learners to gain academic credit towards qualifications from recognised institutions (McGreal, Mackintosh, & Taylor, 2013).

Other examples of collaboration between Australian and international institutions are presented in the later sections of this case study.

- **Resources and infrastructure** – Several Australian universities have decided to invest in resource production and in the development and improvement of technological infrastructure. Examples of resource production are initiatives such as MOOCs. Following the international trend, a number of Australian universities have joined the major MOOC providers, including edX, Coursera and the British FutureLearn, while others have developed their own MOOCs (Norton & Cherastidtham, 2014). Currently, more than 100 Australian MOOCs are on offer.<sup>2</sup>

These are mostly free online courses and are likely to approach learning and teaching more traditionally (xMOOCs) instead of being truly open and adopting open pedagogies and open learning ecosystems (including cMOOCs) (James & Bossu, 2014; Smyth, Bossu, & Stagg, 2015). In Australia, only a few MOOCs have been developed with some open aspects. For instance, the content might be openly licensed, but the learning management system (LMS) where the courses are hosted is a proprietary system and requires learners to register. Some institutions are still investing in this space, but the initial hype about MOOCs seems to have faded to some extent in Australia (Norton & Cherastidtham, 2014).

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2 <https://www.mooc-list.com/countrys/australia>

Another example of investment in resource production is the open textbook initiative at the University of Southern Queensland. This initiative is the first of its kind in Australia, and it is for university staff only. At this stage, the university is planning to fund four Open Textbook Projects. Proposals were submitted by academic staff and their teams, with the launch expected by early 2016.<sup>3</sup>

A few other universities have decided to invest in infrastructure for OEP. For instance, some are developing their own open repositories, so they can make digital resources (including MOOC resources) available to teachers and learners within their institutions first and, in some cases, then to users worldwide. Most universities in Australia are expected to have open access repositories for government-funded research data and outputs, even though they do not have repositories for digital learning resources for openly licensed content (Bossu et al., 2014a). Lack of government and institutional incentives may be the reason for this, as most Australian universities only received funding from the government to set up open access repositories to store and maintain theses, research outputs and data from government-funded projects — not digital learning resources.

However, a small number of universities have developed their open Learning Object Repository (LOR), mostly with the intention of supporting learning and teaching within their institutions. Others have projects under development, as is the case at the University of Tasmania (UTAS) through the Sharing Learning Resources Project. This project has been internally funded and aims to establish a staff culture of sharing learning resources through the use of a UTAS LOR. This is a short project (September 2014 through to December 2015), but has set ambitious outcomes. The project team believes that if a culture of sharing is nurtured and established, academics will realise the opportunities and benefits of having their resources openly licensed and available to all, not only within the university but to all learners nationally and internationally (Padgett, Bossu, & Warren, 2014) — as “OER have tremendous potential to improve the quality, accessibility, and effectiveness of education, while serving to restore a core function of education: sharing knowledge” (Butcher & Hoosen, 2014, p. 18). In addition, this project is exploring and developing a process for peer review of learning resources, which is built into the workflow of the LOR.

- **Open policies** – Encouraged by recent OEP initiatives taking place nationally and internationally, some Australian universities have realised that they need to review and, as needed, further develop their related policies in order to enable innovation and maintain a competitive edge. According to Scott (2014), intellectual property policies are currently under review at several Australian universities. Other universities have encouraged the adoption of OEP through supporting documentation, such as university strategic plans and teaching performance reviews. An example of such a development is the Technology Enhanced Learning and Teaching White Paper 2014–2018, developed by the Tasmanian Institute of Learning and Teaching at the University of Tasmania (Brown et al., 2013).

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3 <http://www.usq.edu.au/learning-teaching/excellence/landtgrants/OpenTextbooks>

That White Paper marked the start of the conceptualisation and dialogue on how the university might start incorporating and implementing open education within its mainstream activities. This was the first of a series of documents that recognised the university’s willingness to engage in open education. Other documents include the UTAS Curriculum Principles,<sup>4</sup> in which “Embracing Open Educational Practices” is the 10th curriculum principle, and the five-year divisional plan<sup>5</sup> of the Deputy Vice-Chancellor Students and Education, where staff are encouraged to take up open education. Perhaps one of the most important policy developments at the University of Tasmania is that staff engagement with OEP (including using and creating a range of learning resources such as MOOCs and OER) can now be formally recognised in the university’s Teaching Performance Expectations.<sup>6</sup>

Some universities in Australia are not waiting for government intervention and support. Instead, they are taking OEP seriously and are working to develop and review their institutional policies. Even so, the Office for Learning and Teaching has funded an initiative that aims to prepare a National Policy Roadmap. This document will be informed by a range of national and international evidenced-based case studies related to OEP projects and initiatives.<sup>7</sup>

It is hoped that the outcomes of this project will help the government realise the full potential of open education to transform Australian higher education, opening up opportunities for further national policy development and support in which open education can flourish.

- **Learning and teaching** – As can be seen, the scope of the transformation of OEP in higher education in Australia has been broad, and has reached several institutional arenas. One could argue that these are not isolated areas; they overlap and influence each other. For example, an institutional policy that awards and recognises staff for the creation of OER could increase resource production, and over time, establish an active culture of sharing and so transform learning and teaching in a particular institution

Although it could be assumed that the examples above might all impact learning and teaching, there are some programmes specifically targeting learning and teaching for OEP. Most universities experimenting with OEP in Australia have some form of academic development activities to build internal capacity. These activities are in the form of workshops, webinars, one-on-one consultancies and online resources produced by the institutions or adopted/adapted from elsewhere. The target audience is most commonly professional and academic staff interested in innovating and learning about OEP.

Also, a few Australian universities have invested time and resources to provide a slightly more structured way to build capacity, not only within their institution but for learners worldwide, through free and open short,

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4 [http://www.utas.edu.au/\\_\\_data/assets/pdf\\_file/0006/567744/7825\\_A3\\_Curriculum-Principles1.pdf](http://www.utas.edu.au/__data/assets/pdf_file/0006/567744/7825_A3_Curriculum-Principles1.pdf)

5 <http://www.utas.edu.au/dvc-students-education>

6 [http://www.utas.edu.au/\\_\\_data/assets/pdf\\_file/0008/447443/7815A-Revised-Teaching-Performance.pdf](http://www.utas.edu.au/__data/assets/pdf_file/0008/447443/7815A-Revised-Teaching-Performance.pdf)

7 <http://openedoz.org/>

or micro, courses. One example<sup>8</sup> is the “Curriculum Design for Open Education,” which is an open and online professional development micro-course focused on developing the capacity of academics to adopt OEP as the basis for innovative, engaging and agile curricula.

Developed by the University of Tasmania in partnership with the University of Southern Queensland, this is a five-week micro-course (about 20 hours of study). Depending on the pathways that learners take during the course of study, it may lead to “micro-credentials,” which recognise learning on a smaller scale than do traditional university courses (Bossu & Fountain, 2015). Another example is the “Repurposing Open Educational Resources: An Introduction” micro-course developed by the University of Southern Queensland. This micro-course covers concepts such as the locating and evaluating of OER, the potential use of OER, and application of Creative Commons licences.

There have also been attempts to capture learners’ engagement with OEP, particularly open content, across a number of Australian universities. The interest in investigating the impact of OEP on students’ learning outcomes seems to be an important trend in the field of OEP (Butcher & Hoosen, 2014). In Australia, however, one strategy being applied is the use of student end-of-year surveys to tease out students’ motivations and preferences for alternative sources and resources to complement their learning. These surveys also try to investigate students’ awareness of OEP. Findings from the surveys are not yet publicly available. However, anecdotal evidence suggests that students might be engaging with open content without knowing it (because of lack of knowledge about open content and the licences, and lack of guidance from their lecturers, who also might not be aware of such content).

The activities discussed in this section are relatively new strategies used by Australian universities as an attempt to raise awareness and to engage academic staff in OEP activities. Unfortunately, there is no evidence yet of the impact of these strategies on learning and teaching using OEP in Australian universities. Similarly, there is little evidence of the integration of OER and OEP into courses and course materials, and of the types of OER being created, shared and re-used by institutions, academics and learners.

- **Research** – Research in OEP has been conducted as part of some of the projects and initiatives here. Postgraduate students in several institutions have also undertaken research, and could very well be the Australian OEP advocates and researchers of the future.

One study, for example, proposes a *continuum of open practice model*, which “approaches OER adoption from the practitioner perspective only, but acknowledges the impact and constraints of the institutional environment” (Stagg, 2014, p. 159).

The model has five stages: 1) Awareness/Access (basic replacement), 2) Sharing a Newly Authored OER, 3) Passive Practitioner Remix, 4) Active Practitioner Remix, and 5) Student Co-Creation. The researcher emphasises strongly that it does not represent a sequential development

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8 [http://wikieducator.org/course/Curriculum\\_design\\_for\\_open\\_education/](http://wikieducator.org/course/Curriculum_design_for_open_education/)

on the adoption of OER. Rather, “each stage is not co- or pre-dependent on the previous one” (Stagg, 2014, p. 159). However, the latter stages of the continuum require practitioners to have a greater understanding of OER and OEP than in the earlier stages. The study was still in progress at the time of this writing, so research findings will further inform and may lead to restructuring of this model.

Another study, conducted by Fatayer (2013), proposes an *OER development model* using design-based research. The model has three stages: 1) Building content, 2) Evaluation, and 3) Publishing. The study is engaging students and academics at the University of Western Sydney in content creation and co-creation, using the model as an instrument, and aims to build a community of practice around OER. Research findings showed that participating students, mostly those who were digitally literate, have engaged in OER creation, and 48% of them licensed their content using the most flexible Creative Commons licences (CC BY and CC BY-SA). In addition, despite the fact that the project used the institution proprietary LMS as a repository for the resources created, 25% of the student-generated content has been shared elsewhere online (Fatayer, 2014).

## **The Importance of OEP Transformation and Final Considerations**

The adoption of OEP in Australia started with the open access movement. It then transitioned to open and free content in the VET and school sectors. Keeping with an international trend, the primary agent of this transformation has been the national and state governments in Australia. With their endorsement, and encouraged by the growing number of OER initiatives worldwide, some universities in Australia embarked on the OEP journey via various institutional and collaborative projects and then later on through government-funded ones.

The scope of OEP in higher education in Australia has rapidly expanded, impacting several institutional levels. However, because many of the initiatives discussed in this chapter are still under development, it is not possible to uncover the full extent of the impact of OEP on higher education in Australia at this stage.

The investments in time and funds from these institutions and government agencies show that the level of commitment to OEP is vital to maintaining competitiveness and prosperity in the sector in the decades ahead. OEP has already transformed Australian higher education by increasing collaboration amongst institutions and advocates; by making high-quality resources openly and freely accessible to all learners; by encouraging the development of more transparent and open policies that promote and award academics who would like to engage in OEP; by supporting learning and teaching in a way that encourages innovation and curriculum renewal; and by attracting new and enthusiastic researchers interested in investigating and helping OEP further progress in Australia.

However, Australia is not an isolated case. This transformation has taken place in other parts of the world such as the UK, the U.S., New Zealand and some European countries — and with much more intensity and impact than in Australia (Bossu et al., 2014a). Compared with these regions, more needs to be done if the Australian higher education sector and government wish to take full advantage of the benefits



of OEP. National strategies in the form of dedicated policy frameworks and funding will need to be forthcoming to put this movement into a more prominent position within the educational mainstream. Such strategies could assist the government in effectively meeting some of its current social and educational agendas (e.g., to increase access to education by a more diverse student cohort, particularly socially excluded learners, working adults and those residing in rural and remote locations of Australia) (Bradley, Noonan, Nugent, & Scales, 2008).

The transformation triggered by OEP may be leading the sector to a better position worldwide. However, many challenges still remain. One of the biggest is the lack of understanding about, and restrictions surrounding, the *Australian Copyright Act*. Australia has one of the most restrictive copyright regimes in relation to education in the developed world (Padgett, 2013). These restrictions have a direct impact on approaches to open content develop, including for MOOCs.

Once these barriers are removed and policy enablers are further developed, the higher education sector in Australia will fully benefit from the transformative potential of OEP. The Australian tertiary sector needs to do more than simply replicate trends elsewhere in the world (as important as these are): it should seek to contribute to the open movement in new and innovative ways. Only then can the open movement “Down Under” truly claim to be about transformation.

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# Open Educational Resources Policy for Developing a Knowledge-Based Economy in the Kingdom of Bahrain

*Nawal Ebrahim Al Khater, Hala Amer and Fadheela Tallaq*

## Abstract

The vision of the Ministry of Education of the Kingdom of Bahrain is to develop a quality education system to reach a high degree of excellence and creativity. To realise the vision, the Bahraini government has pushed its education system to improve the quality of student learning outcomes, develop the level of teachers' performance in teaching and learning, and raise community awareness towards educational resource policies. Among many actions undertaken (e.g., Teach for Learning Project, King Hamad's Schools of the Future Project), the Open Educational Resources (OER) Policy was implemented in 2014, aiming to develop high-quality educational resources to be shared freely. The OER Policy is expected to address the ineffective practice of student-centred learning, the shortage of Arabic educational materials, and the lack of lifelong learning opportunities. Implementation of the policy faces some major challenges: 1) establishment of cultural and linguistic relevance, quality assurance, copyright and licensing, cost of content production, and accessibility of educational content; and 2) availability of digital devices and the speed of Internet connectivity to access, produce and upload digital content. Though no evidence-based impacts can be reported at this stage, the national government has planned its 2020 objectives in terms of funding, legalisation of content sharing, evaluation mechanism, infrastructure, teacher capacity, and textbooks and learning materials.

## Introduction

With a population of 1,360,000, a per capita GDP of USD 51,400, and a per capita GNP of USD 19,560, the Kingdom of Bahrain is doing well economically (UNESCO, 2015). While the country's petroleum exports, aluminium production, finance and construction have been the drivers of its economy,<sup>1</sup> Bahrain has realised that the true wealth today is its people, whose skills, knowledge and creativity will sustain Bahrain's development to the highest levels. Such a mindset leads directly to an emphasis on empowering education.

Bahrain has been upgrading information and communication technologies (ICT) in education initiatives since the 1980s. It has adopted computer hardware, an IT curriculum, an eLearning strategy, and now the Open Educational Resources (OER) Policy developed under the national ICT-in-education policy. While different ICT initiatives have mainly served teaching and learning purposes, the OER Policy is assisting in the areas of: quality learning; knowledge creation and sharing for lifelong learning; and community awareness of educational resources.

The OER Policy, still in an early stage, will help teachers publish and share their learning materials to generate discussions and integrate high-quality lesson designs. At the same time, learning materials will be shared nationally among various channels to ensure lifelong learning opportunities. OER will improve teaching and learning through content enrichment that complements existing ICT initiatives such as the King Hamad's Schools of the Future Project (KHSFP).

The current challenges are with technical support, legalisation of OER, and content control. The availability of digital devices and Internet connectivity is not adequate nation-wide. Without access to technology, users (regardless of educational level) will not be able to freely access, produce or upload digital content for sharing. Also, all OER content is not yet under Creative Commons licensing and this may diminish users' incentives for actively integrating OER in their teaching and learning process. At the same time, the Ministry of Education will need to: evaluate the quality of content in terms of cultural and linguistic relevance; control the cost of content production; and assure accessibility once content is published.

This chapter tracks Bahrain's development in ICT-in-education initiatives, explains Bahrain's readiness for the OER, and discusses challenges and contributing factors to the effectiveness of OER implementation. As the Bahrain OER Policy was introduced only in 2014, its impacts are not yet obvious. However, the Bahrain government has adopted several strategies as a result of examining good practices from countries that have previously implemented OER initiatives.

## The Policy, ICT and Societal Context

### Education Policy in Bahrain

School enrolment and quality of education indicators in Bahrain, compared with those for the world overall, are shown in Tables 2.1 and 2.2.

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1 Central Intelligence Agency. *The World Factbook*: <https://www.cia.gov/library/publications/the-world-factbook/geos/ba.html>

**Table 2.1: Primary and secondary enrolment in Bahrain and the world**

	Enrolment (%)		Private school enrolment (%)		Pupils per teacher (no.)	
	Bahrain	World	Bahrain	World	Bahrain	World
Primary	99	91	33	9	12	24
Secondary	96	73	23	13	10	17

Source: Adapted from UNESCO (2015). *EFA Global Monitoring Report 2015*.

**Table 2.2: Primary student retention rate, primary-to-secondary education transition rate, and literacy rate in Bahrain and world**

Indicators	Bahrain	World
Primary student retention rate	98%	75%
Transition rate from primary to secondary education	99%	94%
Literacy rate	95% (adults)	84% (adults)
	98% (youths)	89% (youths)

Source: UNESCO (2015). *EFA Global Monitoring Report 2015*.

As the tables show, Bahrain is highly competitive in the indicators presented. Private sector works hand-in-hand with the public sector in resolving both access and quality issues in education. The Ministry of Education in Bahrain approaches educational development via various strategies, including:

- **Offering free educational services to the public** – All Bahraini and non-Bahraini students aged 6–18 have access to free public education services, including being provided with teachers, textbooks, teaching aids and social, psychological, academic and vocational programmes. At the same time, similar services are offered in special education and continuing (lifelong) education.
- **Empowering education through the private sector** – The Bahraini public sector seeks to collaborate with the private sector, encouraging private education to help spread education within the framework of the Kingdom’s policy. Besides complementing primary and secondary schools, the private sector is also asked to help construct pre-primary education to compensate for what is lacking in the public sector.
- **Supporting the overall development of students** – Bahrain has introduced individualised programmes to help both high achievers to further develop scientific, cultural, artistic and sports skills and slower learners to integrate into normal schooling. Financial assistance (scholarships and fellowships) is also provided to students to study abroad.
- **Ensuring quality of education** – Teachers are provided with training to develop their ability to keep pace with changes, and develop their vocational and thinking abilities. Training in curriculum design and teaching techniques is introduced to help teachers use new sources of knowledge. At the same time, parents are invited to form an integrated educational environment to facilitate student learning processes.

- **Providing solid administration and management support** – The Bahrain government provides human, technical and financial resources and organisational support to execute educational plans and generally manage, supervise, assess and upgrade the education system.

As Bahrain does not face educational challenges that developing countries generally do, its educational policies reflect its focus on maintaining a leadership role in education. Bahrain's goal is to provide high-quality learning opportunities to help every citizen develop his or her capabilities and faculties to achieve self-assertion, and to develop an educated society as a whole.

## ICT Policy within Bahrain's Education System

Since 1980, the Ministry of Education in Bahrain has worked to apply new educational technologies that can improve teaching and learning methodologies and approaches, and can acquaint students with modern technology tools. There have been four phases.

- **Phase 1: ICT as a subject** – In 1985, the first computers were distributed to secondary schools. The objective was to teach computing as a subject. Since the 1980s, the Ministry of Education has gathered data on students via a central statistical system linked with all schools. This system later helped government draw up universal education policies.
- **Phase 2: ICT as a teaching technique** – In 1997/1998, as all schools were capable of connecting to the Internet, ICT started to be integrated into all subject areas instead of being only for ICT training. The Ministry of Education at that point promoted the Internet as a means for teaching subject matter, establishing contact networks at the local and international levels, and enhancing self-learning in both formal and informal education. Though the idea of how to use ICT as a teaching technique was still vague, the mission was clear: to prepare the citizens for the changing world of technology.
- **Phase 3: ICT as a teaching-learning approach** – In 2001, the Ministry of Education decided to implement ICT in all educational levels and to establish a new eLearning environment. Thus, in 2002, UNESCO and the Ministry of Education formed a partnership and held an international conference to establish a national policy in Science, Technology and Innovation (STI). ICT in education was a key component of that conference and, as a result, King Hamad's Schools of the Future Project (KHSFP) was launched in 2004 (Ministry of Education of Bahrain, 2003).

Since its inception, KHSFP has focused on a set of main operations, including:

- providing schools with sufficient infrastructure (hardware, software, network connectivity and service) and connecting all schools and public libraries with the Internet;
- training teachers and administrators in parallel with introducing new technology;
- revising the curriculum in the light of increasing the impact of ICT;



- producing electronic educational content (e-books and enrichments);
- supporting management at schools and creating a teacher community; and
- monitoring, researching and evaluating these measures.

Teacher training was recognised as being critical for the implementation of the ICT strategy, because teachers must be able to use digital media with their students. Teachers were trained on two important skills relating to the use of ICT: the basic functional ICT competence and the pedagogical skills and understanding of uses of ICT in classrooms. At the beginning, all teachers and stakeholders were trained on the International Computer Driving License (ICDL). Teachers were also trained on using authoring tools to be part of the content production process.

The initial KHSFP project was ground-breaking in the Kingdom of Bahrain and the impacts have been increasing cultural awareness among Bahraini society and organisations about the importance of ICT. At the same time, a new group of human resources and ministry staff has been recruited to manage eLearning projects and develop policies. KHSPF also stimulated the establishment of King Hamad’s digital libraries of the Regional Centre for Information and Communication Technology (RCICT). RCICT is meaningful not only to Bahrain’s ICT-in-education projects, but also to development of the Arabian Gulf region by “harnessing the power of ICTs for creating capacity in knowledge sharing and acquisition.”<sup>2</sup>

- **Phase 4: ICT as a driving force towards a knowledge-based economy** – After a decade of implementing KHSFP, the needed elements for successful implementation of ICT in education now reside within the existing educational system in Bahrain. Looking forward to 2030, the Ministry of Education set as its goal to provide equitable and inclusive quality education and lifelong learning for all, laid out in the *Kingdom of Bahrain 2030 Vision*.

A new project, Digital Empowerment in Education, was introduced in December 2014. It is aimed at harnessing ICTs to provide innovative and sustainable solutions for all citizens. This will further confirm ICT’s role in driving innovative and comprehensive educational reforms. With a decade of undertaking the national ICT-in-education project and corresponding e-government services to support Digital Empowerment in Education, the country is ready to move to the next phase. It is expected that students will be transformed into productive and lifelong learners who will be prepared for digital life in a smart society and will have better opportunities for a good quality of life.

<sup>2</sup> <http://www.unesco.org/new/en/communication-and-information/about-us/how-we-work/category-2-institutes-and-centres/bahrain/>

## **The Development and Implementation of OER Policy**

### **The Demand for OER Policy**

The OER initiative of Bahrain reflects the nation's growing maturity in ICT for education over the past two decades through various policy reforms and practices. With the establishment of RCICT and in alignment with the 2030 Vision, the Kingdom of Bahrain has raised its ambitions to a higher level to maintain its leadership role in regional and global ICT practice in education. The Bahraini government has been leading improvement projects across all fields under the supervision of the Economic Development Board (EDB). The EDB has stated that such long-term improvement projects that were announced for all governmental ministries (including Ministry of Education and all educational institutions reporting to it) are under the umbrella of the *Kingdom of Bahrain 2030 Vision* and aim at "improving the quality of teaching and learning" and "enabling deeper learning and knowledge creation." The 2030 Vision supports the use of OER which, by their nature, allow for the production and sharing of digital educational resources using open licences.

The added value and sustainability that come along with sharing knowledge through OER are the next reform to look into the future.

In the meantime, OER policy development is dedicated to creating a student-catered education system based on OER. Within this new system, deep learning, personalised learning, self-learning, collaborative learning, and informal learning will be integrated with knowledge sharing.

### **Laying the Foundation**

In support of the 2012 Paris Declaration on OER, Bahrain participated in the inception meeting for "Implementing the Paris OER Declaration Project" in March 2013. The inception meeting raised awareness of the potential of OER to address the unachieved Education for All (EFA) goals and advance education development. Participating countries know they were on the right track in driving the adoption of OER in the education system.

As a result of the inception meeting, Bahrain confirmed that the OER Policy would be developed under the national ICT-in-education policy and driven by the Ministry of Education. The OER Policy was to be a collaborative effort beginning with a meeting of invited pre-service and in-service teacher education organisations, NGOs active in the educational field, representatives of associations of school principals, school administrators, teacher associations, and unions to help finalise the OER Policy draft.

An OER committee was formed within the Ministry of Education in January 2014. While the committee is under a single national authority, cross-sectoral involvement and international collaboration are increasingly identified. The committee consists of different educational directorates as well as RCICT, which is also a UNESCO initiative.

## The OER Committee: The Engine for OER

While Bahrain claims country ownership of this Bahrain-specific policy, multiple local and regional governmental sectors are assigned the following responsibilities:

- **The Directorate of Curricula** – Because of its role in designing and providing all curricula-related content, this directorate is an ideal potential provider of OER, especially in terms of open textbooks through a digital content management system.
- **Training and Professional Development Directorate** – As it is the organiser of most training activities and events within the Ministry of Education, this directorate is considered one of the main sources for OER. It has recently started planning to ask all trainers to provide training content with an open licence.
- **The Directorate of Educational Supervision** – The role of this directorate is to ensure high-quality teaching and learning strategies and techniques in the classroom and to document teachers' professional development needs and processes through class visits, activity research, guided readings, educational leaflets, etc. These supervisory methods — supported by lesson plan samples, typical lesson clips, learning activities examples and many other useful educational resources — are prime for implementing and monitoring OER practices. Currently, the directorate is planning to establish an open digital library that will include all the supervisory educational resources to benefit teachers and educators.
- **Primary, Intermediate and Secondary Education Directorates** – These three directorates manage schools' administrations, and therefore can be active entities in helping to establish a rich OER repository, from school-generated resources to international OER to assist with teaching and learning.
- **King Hamad's Schools of the Future Project** – This project supports and supervises the technological practices in schools. In terms of OER, the administration of this project led to the initial training on the OER concept and Creative Commons licensing within the Ministry of Education's different sectors. Moreover, this project runs an educational webpage on the official Ministry of Education website, which is currently employed as a repository for collecting OER from schools, such as e-lessons. The staff of this project manage the upload to its webpage of OER generated from schools.
- **The Directorate of Learning Technologies and Resources** – This directorate produces curriculum enrichment media and manages learning resources centres within all public schools. It has the capability and staff to provide enrichments and media in the form of OER.
- **The Regional Centre for Information and Communication Technology** – RCICT plays a crucial regional role in terms of organising and providing necessary logistic and communication supports for OER events. RCICT acts as one of the main OER Policy sponsors within the country. The services and facilities provided by the centre support training of ICT and OER in the field while connecting with UNESCO and other regions, as necessary. In addition, RCICT has participated actively in the OER committee, and is represented on the committee.

All the above entities currently include OER objectives within their strategic and action plans, in keeping up with the international practices in the OER developments.

## Development of the OER Policy

Participation in the UNESCO Inception Meeting in 2013 encouraged Bahrain to begin considering the implementation of an OER Policy. A national Workshop on Developing OER Policies was organised by UNESCO in Manama, Bahrain, in September 2014, to support the development of the OER Policy draft. During the workshop, 34 specialists representing the concerned entities in the Ministry of Education directorates and other government sectors (including the core members of the OER committee) received the training and made active contributions to developing the OER Policy:

- Essential knowledge on OER and open licences was presented and discussed by the participating specialists to deepen their understanding and practical skills.
- Lessons learned from the implementation of OER initiatives were presented to inform the policy-makers.
- A framework on the development of OER policies and step-by-step guidance were provided to facilitate a needs analysis and to contextualise OER in the national education sector development strategies, address key policy elements relating to OER, and plan the main lines of action and implementation strategies.

The workshop not only built capacity of policy-makers in developing sector-wide OER policies, but also resulted in the first draft of the official OER Policy for Bahrain.

The OER Policy set up the vision for 2020 to support the establishment of a sharing mechanism for the production of easy access to high-quality OER that motivate deeper learning and creativity. The OER Master Plan target is to spread OER culture and empower educators to produce and share high-quality OER online, further enhancing the access to digital content. The plan also supports the establishment of national and international partnerships for exchanging OER.

The OER Policy covers four main areas (reflected through eight objectives):

1. **Teaching and learning at all levels (primary, intermediate and secondary)**, including lesson plans, e-lessons, learning activities, teaching aids and media, and enrichment material
2. **Teacher and educator training and professional development resources**, including training materials and supporting educational resources
3. **Educational supervision resources**, including publications such as booklets and leaflets, action research, video-recorded sample lessons, lesson plans, and sample learning activities
4. **Student-produced content**, including work such as projects, assignments and learning activities

In terms of using OER, major activities planned so far include defining, designing and producing interactive e-books. The e-content standards were to be finalised by 2015. The next step will be designing interactive e-books to support blended learning in the regular educational system. Major stakeholders involved are the Directorate of Curricula and the Directorate of Learning Technologies and Resources, as they will be in charge of developing e-books. Quality assurance teams are, at the same time, engaged in the production process for licensing and accessing purposes.

## From Policy to Practice: Implementation

The key implementation is sustainability. For OER to be constantly available: consistent access must be assured; sources and methods for collecting and creating OER must run in cycle; the technology tools for supporting OER must be reliable; and the OER must be of high quality at all times. If all of this is present, OER will have a long-term impact.

A range of approaches has been taken to promoting awareness of OER and the policy, such as: hosting workshops for stakeholders (mainly school officials) in the Ministry of Education to inform about OER; presenting school publications about OER, with visual layouts; organising school-based OER activities for students; and applying social media to promote OER. Similar approaches have been taken in developing capacities among educators. For example, workshops have been conducted by educational technology specialists on open licence, Creative Commons licences, training techniques, needs assessment, and curriculum and supervision strategies.

In terms of infrastructure, a Moodle platform, previously adapted by KHSFP, was customised with an open content directory so that teachers could start testing the new functions. The Moodle platform was chosen because of its long-lasting stability and major users' familiarity with it. This is expected to further ensure the sustainability of both OER and other related ICT for education initiatives.

The final tasks in the implementation stage are: releasing of copyright through Creative Commons to secure open licensing, gathering OER materials, and making the OER available through a portal.

Figure 2.1 shows the OER activities in Bahrain for 2013 and 2014.

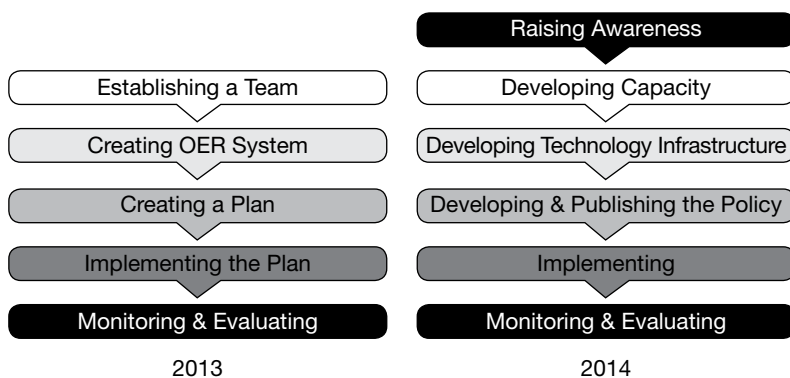


Figure 2.1: Activities in implementing OER in Bahrain, 2013 and 2014.

## Ongoing Monitoring and Evaluation

The OER committee is planning to explain and mainstream the OER Policy implementation across all directorates over the next few years since the policy's official launch. This will continue until OER practices become the norm in Bahraini institutions and OER are integrated into institutional strategic and action plans.

A number of indicators (quantitative and qualitative) were designed within the OER Master Plan to monitor and assess the achievement of the objectives. Examples are:

- Awareness of OER and Creative Commons licensing within the Ministry of Education – an increase will reflect the effectiveness and efficiency of the ministry of promoting activities around the OER Policy
- Number of OER produced and published – an increase will quantify the involvement of teachers and students in pursuing OER
- Quality level of the OER published – an increase will help identify whether the quality of learning and teaching has improved
- Rate of openly licensed resources exchanged with national and international educational and non-educational institutions – an increase will reflect the quality and quantity of Bahrain's resources and of the current state of OER global collaboration

## Enabling Factors to Sustain and Further Develop OER Policy

No single factor can ensure a policy's ongoing effect. However, Bahrain's dedication to creating a highly educated society and founding a knowledge-based economy is certainly one factor that will help sustain the OER Policy.

Bahrain has seen successful implementation of ICT in education projects in the past. So, for the OER Policy, although still in its early stages, there are good reasons to believe that the impact will exceed national expectations. It is already an ambitious plan and it should serve as a global role model for nations that need a successful example to push them to participate in OER for educational reforms.

## OER Policy Aligns with National Development and Other Policies

It is not by accident that the OER Policy matches well with the national policy in many sectors. The OER Policy was initially generated as a strategy to cope with *Bahrain's Economic Vision of 2030*. Because the education sector serves society as the provider for knowledge-based economic development, overall education policies are designed to align with economic and national development policies. Thus, the OER Policy fits comfortably into all educational plans in Bahrain, such as *The Ministry of Education Strategic Plan 2015–2018* and *The Strategic Plan for ICT* within the Ministry of Education.

Furthermore, the OER plan not only aligns with existing ICT initiatives (e.g., KHSFP), but provides added value in complementing or integrating with them. The *E-Content Criteria Guide* has also been implemented as a result of the

promotion of OER and will support quality assurance in OER. As well, Bahrain is considering an E-Government Strategy that involves intensive use of technology.

### **Collaborative and Transparent Approach to OER Policy Development**

Development of the OER Policy has been transparent from the beginning, revealing the collaborative efforts of various entities. During the first year of the OER Policy framework, the OER committee organised several seminars in which different educational sectors were invited to discuss and develop the OER Policy Master Plan. The parties involved were from both the Ministry of Education and external institutions and organisations, including UNESCO, the Office of E-Government, King Hamad's Digital Library and RCICT.

In the near future, more players will be included, such as the higher education institutions, private educational institutions, and other stakeholders from various societal associations. Policies are annually reviewed within the Ministry of Education. This ensures continuous development of the OER Policy and Master Plan for achieving wider scale implementation of the project. As the policy continues to unfold, accepting suggestions from relevant and reliable sources and allowing for annual reflections, it will be revised as necessary, to ensure it meets the nation's requirements.

### **Quality Assurance of E-Content as Part of Monitoring and Evaluation**

Monitoring and evaluation is one of the most important considerations in implementing the OER Policy. Although the overall monitoring and evaluation plan is still under development, the most essential aspect given the nature of OER — the quality assurance of e-content — is already being tracked.

*The Digital Content Production Guide* was developed as a resource to help teachers produce OER. The strategy for providing and producing e-content is to use a wide variety of resources and to mix and match content within multiple systems. Taking this into account, the guide lists the procedures to ensure the quality of OER production.

The quality assurance section in the policy explains open licensing and why quality assurance is important, not only for subject matter content but also for ancillary resources such as enrichment material, lesson plans, activities and other teaching aids. Quality assurance for professional development resources is important too. The guide also provides revision and assessment advice on the different phases of production — from technical revision to formal approvals, uploading, final revision and the nomination of outstanding resources.

Quality is also sustained by the practice of collecting and preserving high-quality student assignments, projects that can be released as OER. This and other publication of OER will be handled by the KHSFP project manager who, along with the OER committee, ensures that OER implementation is aligned with other policies (e.g., for human resources, curriculum, e-content). The OER committee organises partnerships with national and international institutions to provide OER that contribute to enhancing the quality of the teaching-learning process.

The quality assurance of e-content is an outstanding example of the Bahrain government's dedication to applying monitoring and evaluation in the OER Policy (see box).

The OER committee organises partnerships with national and international institutions to provide educational content (as well as cultural, literature, media, artistic, business, health, environmental, services, etc.) as open resources that contribute to enhancing the quality of the teaching-learning process.

The quality assurance section in Bahrain's OER Policy reads as follows:

1. Copyright is protected for content producers with open licenses. Educational materials as well as Training and Research content, produced within the Ministry of education, should be openly licensed by a CC (Creative Commons) license. These materials include content such as:
  - Curriculum and Enrichments
  - Lesson plans, E-lessons learning activities and teaching aids.
  - Training content, educational and scientific Researches and Educational leaflets, whether for the aim of improving teaching and learning or professional development.
2. To assure the quality of produced educational contents, the Digital Content Production Guide should always be referred to throughout production. Subsequently the content should be revised and assessed through the following phases:
  - Technical revision from the Educational Technology Specialist within the school according to the Digital Content Production Guide.
  - Revision and approval by the Senior Teacher.
  - Revision and approval by the school principal.
  - Uploading the revised and approved content on the specified webpage.
  - Final revision by Educational Specialists (Curricula & Supervision Directorates)
3. Beside teacher's practices of uploading their work, senior teachers, school principals, chiefs of schools and all educators, who supervise teaching and learning processes, should periodically nominate good quality educational content produced by teachers for the mutual benefits of teaching and learning.
4. Educators, within the Ministry of Education in different posts, should nominate their educational production to be published as OER after being openly licensed and approved officially by their directories.
5. The OER committee designs an official mechanism to collect useful and high-quality student's assignments, projects and educational material to be potentially transformed into OER sources. This will happen in the future phase of OER policy implementation in the Kingdom of Bahrain.
6. King Hamad's Schools of the Future Project manages the OER publication process of the material gathered from schools or directories within the Ministry of Education or provided from other sources on a designated webpage (certain criteria should be followed).
7. The OER committee coordinates with the concerned officials to assure the implementation of the OER policy is aligned with other policies like HR, Curriculum and E-content.



## **Sophistication of the Implementation Strategy Executive Plan**

Objective 1 of the OER Policy states: “Ensuring that all the learning materials produced by teachers and students, by the Ministry of Education and supporting materials developed for teachers using public funds will adopt the CC-BY-NC licence.”

Both the educational technology specialist team and the quality assurance team play important roles in teacher- and student-generated OER. Their responsibilities include co-ordinating and supporting production of digital materials, evaluating and uploading contents to the quality assurance team in the Ministry of Education, and licensing qualified materials to make them accessible online. Also in place are step-by-step instructions, indicators for evaluation (number of views and downloads), responsible agency (KHSFP with quality assurance team), budget and financial resources (KHSFP funds and private sector), and a supporting or incentive mechanism (rating system for teachers and educational prize from KHSFP). This detailed Implementation Strategy Executive Plan is sophisticated enough to make solid impacts through well-planned works.

## **Transformation Through Awareness**

The early signs of the OER Policy’s implementation show that it has had a positive influence on a number of educational issues and contexts. One indicator is that the philosophy of sharing and the concept of openness have already started spreading slowly but gradually in schools and government directorates.

The awareness of this philosophy began with the OER committee conducting several events and activities after the OER Master Plan was formed. During the OER Master Plan development, a variety of OER activities and events also took place, including workshops for teachers, administrators, government employees and specialists. About 1,000 e-lessons have been uploaded, and news and information on OER activities have been regularly circulated online, in the policy-launching ceremony (September 2014) and in a policy development seminar (December 2014).

By continuing to promote the OER Policy and draw people’s interest in participating in OER, the Bahrain government can expect to see more transformation in the education sector in the near future.

## **Current Challenges and Future Plans**

Though Bahrain has to continue working hard to ensure the positive outcomes of the OER Policy, the OER committee has short-term plans and expectations. This will include challenges to be tackled, future plans to be adjusted and expected benefits to look forward to.

### **Challenges**

During the initial forming of the theoretical structure of the OER Policy, the OER committee identified a number of challenges in producing and sharing OER:

- The educational content:
  - cultural and linguistic compatibility: to be solved through the collection of both local and international OER
  - quality assurance: content quality to be monitored and evaluated
  - licensing and copyright: ensuring Creative Commons Attribution-ShareAlike (CC BY-SA) licences are used
  - production/adaptation costs: to be evaluated
  - ease of access: to ensure the teacher-uploading portal needs are complemented with a student/teacher-downloading portal
- The provision of high-performance digital devices and an effective communication network for the production and upload of digital content: for this, upgrades in network capacity and better devices are needed

## **Future Plans**

After the current OER implementation phase ends in 2015, the next phase will expand beyond the school-only setting and move towards a larger scope. This potential implementation plan will include the following components:

- Curriculum: open textbooks through the Content Management System
- Higher education resources: research to be conducted by students
- Media and artistic content: for example, photographs or media clips produced by professionals and associations
- Data and other useful documents: for example, data, figures and statistics from government and private associations, such as the E-Government and the Ministry of Cultural Affairs, Museums and Exhibitions

## **Recapping: Expected Benefits**

The Ministry of Education in Bahrain has made enormous efforts to help education in the country conform to the rapid development in the world. The ministry's goal is to prepare students for the 21st century's technological and scientific advances. Bahraini citizens should be prepared to deal with the technology and knowledge challenges of the coming era with confidence and enthusiasm. To this end, various modern technologies have been introduced to schools and society. Now it is for OER to make further impacts, following the footprint of Bahrain's previous ICT for education policies and UNESCO's 2012 Paris Declaration on OER and 2015 Qingdao Declaration on ICT in Education.

Among the expected benefits of Bahrain's OER Policy:

- Teaching for learning practices collaboration: In terms of lesson planning, e-lesson design, digital teaching aids, lesson activities, differentiation resources, higher order thinking resources, lesson starters and plenaries, assessment for learning tools, behaviour for learning tools and techniques, etc., collaboration should happen among teachers, students, and various educational players.

- Development of a rich learning environment: Students across all levels especially secondary level and higher education, are expected to form rich networks of knowledge creation and sharing. This practice will enrich and deepen their learning quality.
- Enhanced and accelerated training and professional development: Teacher and educator training and professional development processes are expected to improve in terms of content accessibility and flexibility across time zones and geographical locations.

Such great educational benefits are likely to take time to reap in reality.

Nevertheless, when education changes society, the power to achieve national goals can be realised too.

## Conclusions

All the activities described in this chapter have laid the foundation for success of Bahrain's OER Policy.

First, because the OER Policy corresponds to the overall national development goals and aligns with other policies, it is less likely to encounter strong opposition that could slow down or even halt progress. Second, the OER committee and the regional and international players are making efforts to further promote collaboration and transparency in adjusting the policy. Third, the OER Policy's commitment to provide quality materials, including monitoring and evaluation, should ensure the policy's success in meeting the national goals. Fourth, the Implementation Strategy Executive Plan is practical. And lastly, the key beneficiaries in the OER Policy are becoming more involved through various events that the OER committee has organised.

Bahrain is getting more mature through three decades of practices, lessons and innovations and such maturity is being well reflected in its OER Policy.

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# The State of Open Educational Resources in Brazil: Policies and Realities

*Carolina Rossini and Oona Castro*

## Abstract

This chapter discusses the Open Educational Resources (OER) movement in Brazil, a grassroots initiative, in relation to the country's educational, legal and political systems. National and regional OER policies and processes are explained, as are the obstacles to put into practice. Two projects are used as examples of the education challenges being addressed by OER, such as adapting learning materials to local realities.

## Brazilian OER in Context: Rights-Centred, Multi-Stakeholder, Multi-Scale

Brazil has 192,676 public schools, with enormous social, economic and cultural differences. Its educational plans must address a sweeping variety of realities and learners, from some of the world's largest cities to the rural reaches of the Amazon. Tens of millions of Brazilians study in public schools, 9 times more than in private ones. Thus, Brazil's educational scenario can benefit from the promised financial aspects of Open Educational Resources (OER). For example (Allen, 2010):

- The direct cost per institution of developing high-quality learning materials released under open content licences is cheaper when shared across multiple institutions than doing this alone.
- OER provide unique opportunities for all institutions to diversify curriculum offerings, especially for low-enrolment courses in a cost-effective way. Using OER approaches means that teaching institutions do not need to commit to the costs of teaching low-enrolment courses in the absence of confirmed student registrations.
- Open textbooks can reduce the cost of study for learners.

With Brazil's range of education stakeholders and settings, and the importance of public education, the use of digital resources, licensed into a culture of remix and adaptation, has proven to be useful for early entry to OER. But, like any state with an advanced educational infrastructure, the long-term impacts of OER will take time to be seen, as detailed policy and local context catch up to the conceptual work done at federal and state levels.

Additionally, while Internet access, free software (Benson, 2005) and liberal copyright licences such as GPL and Creative Commons are well advanced in the country, the social (philosophies of authorship sharing and practices) and financial (financing and funding for OER) elements are far from ideal. The result is a scenario of a strong but dispersed community of OER advocates, supporters and practitioners.

### **Brazilian Educational Context**

Brazil's education system has been following a human-rights-based approach to education for all since 1988, after the signing of the Constitution. The most recent concrete legal expression of the human right to education is the current National Plan for Education, a key strategic plan establishing 10-year educational priorities in Brazil. The National Plan was built with the input of participants from all over the country. The plan became a bill of law that was sent to the Congress in 2011 and approved in 2014. It includes information and communication technology (ICT) as a core element in all of its goals, and also defines educational targets, strategies and preliminary metrics. The plan currently in force also encourages the adoption of OER to improve K-12 education. Municipalities and states are now tasked with local regulation of the plan, making local laws to enforce the national policy.

In Brazil, municipalities, states and the federal government share responsibilities, policies and strategies. Such division requires more public resources from all government levels and this can turn into the greatest obstacles to the achievement of the Plan's goals, creating difficulties for centralised approaches to policy. Such a system gives reasonable freedom to regional and local stakeholders, including those in the private sector, making it difficult to implement any top-down, unified approach or methodology. For instance, the federal government is responsible for both higher education and general directives for basic education through the National Plan for Education. The state governments are responsible for devising and implementing regional policies, the necessary supporting infrastructure, and curricula. The Brazilian OER effort necessarily touches the system at multiple scales and stakeholders, and inherits some of the same complexities as the centralised policy regimes.

Procurement is a powerful influence, as in all taxpayer-funded systems of public education. Brazilian schools are supplied with educational materials recommended by the Ministry of Education and bought by the government through public procurement processes. States can opt out of this system and buy their own educational materials. The National Plan for Didactic Books since 1929 is responsible for the acquisition, quality control and distribution of textbook and complementary educational material for all the public schools across the country.

Over 2,500 different book titles were acquired in 2014.<sup>1</sup> In that year, the federal government invested R\$ 1,127,578,022.81 (about USD 292 million, in October 2015) to acquire didactic materials for basic education (elementary and high school) from 25 publishers — of which four controlled 71.86% of market share of government’s purchases of textbooks.

In procurement, the National Plan for Didactic Books calls yearly for publishers interested in creating original books and textbooks for schools all over Brazil to submit proposals. A committee evaluates the proposals and determines the government’s catalogues to be bought by schools.

The National Plan for Didactic Books has not yet supported or expressly accepted OER materials, and there could be several possible reasons for this. The supply of books is pretty much based on traditional business models of publishers, making it complex to impose changes on copyright management models (e.g., requiring suppliers to use open licensed resources in their books, such as images). There is also a lack of options of OER textbooks that follow the curricula of the National Plan for Didactic Books. As well, the Ministry of Education requires that a single publisher guarantee it has exclusive rights over the work being licensed and supplied and that this party give the ministry exclusive rights for the use and exploration of the work.

## **Technological Context and ICT in Education**

The policy discussions mentioned above assume a basic capacity for ICTs, one that is present in Brazil thanks to longstanding investment in ICT development in general. About 43% of Brazilian homes had access to the Internet in 2013, a massive increase from 2005’s rate of 13%. For the first time, more than half (51%) of Brazilian individuals also had access to the Internet in 2013 (at least once in the previous three months); and in urban areas this rate reached 56%. Mobile access was available to only 31% of the population in 2013, but another survey found a year-to-year increase of 65% (Matoso, 2014).

A recent survey on educational use of ICTs showed that 82% of teachers and professors made use of digital communication technologies to access or provide materials or to run activities in the learning process. However, the market slants in one direction: only 21% of teachers used the network as makers of educational resources using ICTs (Brazilian Internet Steering Committee, 2014). In a contemporary “digital divide,” only 7% of public schools feature connected classrooms, compared with 26% of private schools, and connectivity speeds suffer the same disparity (Brazilian Internet Steering Committee, 2013).

The home connections of students in public schools (54%) also trail those in private school (91%). Interestingly, teachers are more than twice as likely to have Internet at home as an average citizen. In terms of intermittent but regular access, 95% of students had had access to the Internet sometime in their lives, 99% of basic and secondary students had had access in the previous three months, and 51% had had daily access. Among teachers, 99% had been connected in the previous three months.

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1 *Elementary and High School – Traded Values for Printed Books and Multimedia Content*: <http://www.fnde.gov.br/arquivos/category/35-dados-estatisticos?download=8488:pnld-2014> [in Portuguese]

## The Brazilian ICT Context

Government policies targeting digital inclusion have been implemented in a variety of ways:

- public access centres like “telecentres” and “One Laptop per Child” featured as the leading policies during the first decade of the 21st century; and
- Banda Larga nas Escolas (Broadband in Schools), as part of the General Plan of Universalization Goals (for Switched Fixed Telephone Service) established by the decree no. 6.424/2008; and
- Brasil Conectado (Broadband National Programme), which started in 2010 through decree no. 7.175/2010.

Tablet distribution for secondary education teachers also emerged (National Fund for Educational Development, n.d.), including distribution of educational content.

Brazilian programmes and governmental ICT-in-education initiatives such as Proinfo, Programa Nacional de Informática na Educação (the National Programme for Informatics in Education) aimed at equipping schools with computers, IT labs and digital educational resources. More recent programmes measure against technological benchmarks, including broadband in schools and providing each student with a computer.

The Brazilian government offers alternatives with public access spots, schools and libraries. However, the private telecommunications companies are the ones responsible for the main increase in Internet access through domestic and mobile accounts. The Brazilian Internet Steering Committee survey<sup>2</sup> in the educational field identified that out of 99% teachers who had access to Internet, 88% used it more often from home, although 74% also made use of it at schools. Among students, 40% had access at schools and 77% from home. When it comes to venue where they most frequently had access, only 6% answered schools, while 73% more often connected from home.

Banda Larga nas Escolas (Broadband in Schools) is a federal programme that aims at providing every public school with broadband Internet infrastructure to foster public education in the country. It is a result of changes made in the General Plan of Universalization Goals (for Switched Fixed Telephone Service) rendered under the public regime by the decree no. 6.424, in April 2008. Through these changes, telecommunications operators were no longer compelled to comply with public street telephone universalisation, but instead were required to ensure both (1) the installation of broadband Internet infrastructure in every Brazilian municipality and (2) connectivity in every urban public school with maintenance services, free of charge, until 2025. The shift from street phones to broadband marks a key example of ICT policy aligned with education policy.

The National Plan for Education continues this alignment, establishing strategies for educational development during this period. It calls for Brazil to “universalize access to Internet by the end of the fifth year of its effectiveness (thus, 2019), and [...] triple the numbers of computer per student rate in public basic schools, promoting the pedagogical use of ICTs” (Strategy 7.15). The plan also states that Brazil “shall provide digital technological resources and equipment for

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2 <http://cetic.br/pesquisa/educacao/indicadores>



pedagogical use at schools at every public basic school, moreover creating the basis for universalisation of libraries in educational sites, with access to internet” (Strategy 7.20). Other strategies aim at ICT infrastructure, capacity-building for digital technologies, and creation of digital archives.

Although 97% of schools were connected to the Internet, 67% of schools had fewer than 30 computers. Extremely low connectivity is also an issue, with almost 40% of schools provided with a speed under 1 MB. Thus, although technically schools are provided with ICTs, in fact infrastructure, speed and maintenance are still great challenges to overcome the digital divide between schools. This environment requires resource sharing until infrastructure catches up for all citizens, and can increase the utility of digital OER versus closed educational resources.

## Digital Educational Resources Initiatives

Several public institutions handle national ICT policies. However, the Ministry of Education, the Ministry of Science and Technology, and the Brazilian Internet Steering Committee deserve special focus due to their specific interest and work on OER. Most Brazilian government initiatives that support the production and sharing of digital educational resources and digital repositories were not created to promote OER initiatives, but to deal with themes such as the use of ICTs in the schools and the training of the schools’ communities.

Strategies target, amongst other priorities, the training of teachers in ICT skills, the production of digital educational resources that were culturally and regionally relevant, and the access to digital content for both teachers and students in the country. These goals can be traced back to the Brazilian Plan for the Development of Education, which provides a plan of actions for the directives of the National Plan of Education.

Results of these plans were the Portal do Professor (Teachers’ Portal), the Banco Internacional de Objetos Educacionais (International Database of Educational Resources), and Rede Interativa Virtual de Educação – RIVED (Interactive Virtual Network of Education).

**Teachers’ Portal**<sup>3</sup> – The Teachers’ Portal is a knowledge management system and repository, which also serves as a community of practices (Rossini, 2010). It was established in 2008 by a partnership between the Ministry of Education and the Ministry of Science and Technology, with the goal of providing better professional training for K–12 teachers, including the development of their ICT skills. The option to focus on teachers’ training was part of the Plano de Ações Articuladas (Articulated Actions Plan), a set of multi-year actions planned with each municipality and focused on basic educational improvement. The Teachers’ Portal is part of this strategy and seeks to integrate the public K–12 education by creating an environment where decision-makers, academics, teachers and students are connected. It offers a platform as a knowledge management system and a repository of digital learning objects.

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3 <http://portaldoprofessor.mec.gov.br/sobre.html>

Because Brazil does not have a corporate authorship system (where the authorship shifts from the employee to the employer) in its copyright law (such as in the USA), governmental works in Brazil developed by public servants and teachers are not automatically available to the administration or the public. Thus, each piece of copyright for each digital educational resource deposited in the Teachers' Portal repository is of the original author's, who can then choose how to license it. The portal also lists and links to other repositories and websites with resources that are relevant for education.

It is clear that the Teachers' Portal does not have a copyright policy that specifically fosters OER. However, one exception exists. After targeted efforts by the OER-Brazil project (including direct multiple training and meetings with the staff of the Teachers' Portal's multimedia section of educational resources), a repository of OER has been established. A sample of the deposited content in that section shows that the Ministry of Education received the rights of the work and can share it for non-commercial purposes. In those cases, the multimedia is an OER.

**RIVED (Interactive Virtual Network of Education)** – The webpage of the Interactive Virtual Network for Education carries the following notice:

“The contents produced by RIVED are public and will be, gradually, licensed through a Creative Commons licence. These contents can be accessed through our search tool in our online repository, which allows you to see, copy and comment the published contents. With the Creative Commons licence, the author rights are guaranteed and it will be possible for others to copy and distribute the material, with the proper attribution to the authors.”

However, there is no specification within the RIVED system as to which Creative Commons licence will be adopted.

These are only some of the few initiatives of the Ministry of Education that might support the generation and use of OER. Other government-led digital initiatives include the Public Domain Portal and Open University of Brazil:

- **Folhas Project** – One of the few public-sponsored projects that was created and developed with the intention to provide OER was the Folhas Project, started in 2003 by the State of Paraná, aiming at providing textbooks developed by the teachers for their own public schools. The creators of Folhas were not aware of the OER movement or of the Creative Commons licences. Nevertheless, they developed the textbooks in an innovative way using interdisciplinary collaboration and co-authorship, focused on the needs of the classrooms and supported by a new system of incentives to the teachers–authors (including sabbatical period and professional recognition).<sup>4</sup> The textbooks are available online and have a note created by

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<sup>4</sup> Video interview with Mary Lane Hunter, co-ordinator of the project <https://www.youtube.com/watch?v=jaWNA9Nd0sM> and interview for Livro REA at <http://www.artigos.livrorea.net.br/2012/05/projeto-folhas-e-livro-didatico-publico/>

the government equivalent to an open licence.<sup>5</sup> However, the project has officially ended after the change of the local government.

- **MIRA** – The mapping project<sup>6</sup> [mira.org.br](http://mira.org.br) has been pointing out relevant initiatives and how “open,” in legal and technological terms, they are. However, none of the projects identified so far was born with the specific mission to provide OER. All of them were focused on offering some form of distant online learning capabilities, by providing professional training to teachers (e.g., Open University of Brazil) or providing digital learning resources (e.g., RIVED and the Teachers’ Portal).
- **Open University of Brazil** – This is an initiative started in 2005, resulting from a partnership among public universities, states and cities governments, and co-ordinated by the Ministry of Education. It is not a new institution or university, but instead a network of institutions and universities that aim to bring higher education to municipalities that lack access to quality programmes or, when courses are available to them, they are insufficient for the existing demand.

A primary concern of the Open University is the initial and continuing education of public school teachers, mainly for the fundamental learning cycle, through the offer of distance learning courses. The courses are offered through learning centres built by the cities, each including a library and science labs for Computer Skills, Physics, Chemistry and Biology. The learning centre also offers the students face-to-face tutoring. The public higher education institutions involved in the network are responsible for course development as well the instructional materials. There is no unified policy, terms of use or terms of licence of the material produced and used under the Open University.

Additionally, there is no clear technical standard: the materials vary from printed copies and textbooks to online resources distributed by each partner and access point. However, the use of the word “open” within this project should not be understood as in the definition of OER. The courses offered by the learning centres are free of charge for those selected. The selection process follows the public entry examinations rationale common to the public higher educational system in Brazil. The materials are not available for those not formally enrolled and no part of the content is available online. Also, the lack of open licences and a clear federal policy regarding the ownership of the content produced by the institutions in the network but paid by the federal government means that each institution (or even each author — a professor or a hired consultant) owns the copyright over elements of the content developed for the courses offered through the Open University of Brazil.

## Logistical Preparation for OER Implementation: Copyright in Brazil

Brazil was an early adopter of the Bern Convention and of the TRIPS agreement, with its current copyright law in force since 1998. The Brazilian law 9.610/98 regulates copyright and adopts the system of exceptions and limitations to grant

5 <http://www.educadores.diaadia.pr.gov.br/modules/conteudo/conteudo.php?conteudo=6>

6 <http://mira.org.br/>

rights to access and use knowledge. In addition to law 9.610/98, the 1940 Penal Code (recently altered in its copyright-related matter by law 10.695/03) and Software Law (9.609/98) form the system that regulates copyright in Brazil. The Brazilian copyright law is one of the most restrictive of the world, without defining exceptions and limitations for educational purposes,<sup>7</sup> apart from a specific paragraph allowing student notes but not their publication, in any form (law no. 9.610/98, 46, IV).

By definition, OER touch on copyright and copyright licensing arrangements, and no sketch of the policy landscape is complete without mentioning a significant pending copyright reform in Brazil.

Since 2007, the Ministry of Culture has led efforts for the reform of the copyright law through numerous public consultations and ample public debate. It received 8,000 contributions from the public during the consultation period in 2010. The latest official and public version of the Copyright Reform draft bill is from 2011 (though it has not yet been presented by the government in the Congress). It addresses educational uses of copyrighted works, with exceptions and limitations to copyright, including:

“The representations, recitations, declamations, exhibitions, displays and public executions carried out in familiar recess or when used as didactic and pedagogical resource, by way of illustration in educational or research activities in the context of education, including in public spaces for artistic training, if made with no commercial or profit intent, and to the extent required by the specific purpose.”

“The reproduction, the translation, the distribution, and the making available to the public of parts of preexisting works, of any nature, or of the complete work, if of visual arts or small compositions, as didactic and pedagogical resources by professors, as a way to illustrate, in educational and research activities, in the educational context and to the extent necessary for the specific purpose, as long as this activity has no commercial or profit intent, and as long as the author and the original source are given proper attribution....”

It is important to notice that in July 2015, the Ministry of Culture re-opened debate about the Copyright Reform draft bill by initiating conversations in Brasilia and São Paulo with core companies and civil society organisations that have been working on this process since its beginning. Expectations<sup>8</sup> created in January 2015 around the proposal of the bill in the current year have been lowered by a political crisis between the government and the Congress.

These changes address certain authorised uses that can be highly controversial, related to undefined authorisation of partial copies of works and the reproduction of works for the visually impaired. In the current fractured political landscape, the bill’s current status is unclear. But should it pass in its current form, it would obviously reshape the intellectual property context in which OER are considered,

<sup>7</sup> See chart on page 80 at [http://www.law.yale.edu/documents/pdf/ISP/A2KBrazil\\_bkmmk.pdf](http://www.law.yale.edu/documents/pdf/ISP/A2KBrazil_bkmmk.pdf)

<sup>8</sup> <http://convergecom.com.br/teletime/12/01/2015/juca-assume-com-promessa-de-reforma-na-legislacao-de-direito-autoral-e-de-incentivos-2>

since the present legislation prohibits the use, re-use and distribution of any cultural and intellectual works for any purpose, including an educational one. The permission of certain sorts of use, in light of the fair use concept, might bring new opportunities for the educational system.

Creative Commons licences were launched in Brazil in 2004 and are now in wide use. The licences were adapted and translated in all versions and combinations, and form part of the curricula of law and communication schools. Cultural and political icons such as Gilberto Gil, a famous Brazilian musician who served as the country's Minister of Culture from 2003 to 2008, have helped make the licences widely known. Creative Commons licences have also been adopted by a variety of open access and OER initiatives (Rossini, 2010).

### **Brazilian OER Governmental Policies**

FGV Online is the online arm of the Getúlio Vargas Foundation, one of the most prestigious private universities in Brazil. It was one of the initial partners of the OpenCourseWare Consortium. After its pioneering work, key OER concepts were introduced to institutions in Brazil through the practice and study of distant education, open education and policy advocacy; and formalised in 2008 with the launch of the OER-Brazil project. The project mission is to raise awareness and build an OER grassroots community while at the same time promoting and supporting the development of OER policies and projects. The open education movement formed around the core OER-Brazil advocacy efforts have built awareness and advocacy networks across Brazil's multi-stakeholder, multi-scale policy landscape. OER groups in Brazil work in a set of alliances interested in OER policy. Workshops, conferences in Brazil and abroad, media campaigns, and other community activities create opportunities for knowledge exchange, advocacy training, and policy development.

On the legislative side, Brazilian OER civil society advocates created a series of strategies to complement efforts with the executive branch and efforts around the changing of classroom practices. Four of those strategies became significant legislative pushes, and two became law: the National Plan of Education (featuring the Preference for OER) and the City of São Paulo's OER decree of 2011. An unsuccessful major effort was the federal bill 1.513/2011, passed by a series of House of Representatives Commissions but not by the broader legislature. A São Paulo state bill (no. 989/2011) was also declared unconstitutional by the State Governor after being approved by the State Legislative Assembly.

All those legislative initiatives were independent from one another and the link between them is the OER-Brazil project, which provided advice and support to prepare and present these for approval.

**National Plan of Education (Bill No. 8.035/2010)** – On 3 June 2014, the Brazilian Chamber of Deputies voted on and approved the National Plan for Education, which increases education investment to match 10% of the country's GNP. The 10-year plan calls for 20 goals, including: eradication of illiteracy; an increase in the number of spaces available in childcare facilities, high schools, professional education entities, and public universities; universalisation of school care for children between four and five years old; and availability of

full-time schooling for at least 25% of middle-school students. After signing, states and municipalities had one year to develop their own education plans. The status of these was not clear at the time this chapter was being written.

Among more than 3,000 changes proposed by many stakeholders and added to the plan, the following reference to OER made it through the process (7.12):

“To select, certify and disseminate educational technologies for elementary and high school, ensure the diversity of methods and pedagogical proposals, *with priority to free software and open educational resources* [author’s italics], as well as the monitoring of results on educational systems in which they are applied, and implement the development of educational technologies, and innovative teaching practices in education systems, including the use of open educational resources, that ensure the improvement of student flow and student learning.”

The National Plan for Education is not a law, but a policy document carrying the force of a law. It will be the foundation for other laws at multiple levels of governance. OER’s presence in the plan is a significant achievement by the community.

**City of São Paulo Compulsory Licence for OER (Decree No. 52.681/2011)** – Decree no. 52.681 of 26 September 2011, an executive law in force since 2011, provides for compulsory licensing of intellectual works produced with educational, pedagogical and similar purposes within the scope of public municipal schools in São Paulo. The language specifies that any resource and material with “educational, pedagogical and similar purposes” by the Secretary of Education of the city must be openly licensed.

The decree includes examples of “books and textbooks, curriculum guides and guidance manuals for feeding the school program.” It calls for OER to be electronically stored, published and made available to public access by any individual, public or private institution, NGO or any other social entity. It determines the Ministry of Education licensing to cover “free use, copy, distribution and transmission” and derivative works.

The decree has an unusually large footprint: São Paulo is the largest city in Brazil, and seventh in the world, at 12 million residents. It also has an important political and educational inclusionary impact, as described by the Secretary of Education:

“I see education as a collaborative process, whether among students, teachers and students or only among teachers. OER seems to be the key to transform this collaborative process into something with a greater reach, but which respects the particularities of each region. It is necessary to ensure a collaborative production strategy subject to local adaptation, because we cannot have a kid in the city of Manaus learning with examples of São Paulo Subway, or even out of the country,

in the didactic book. Comprehension becomes easier with adaptation. Therefore, I believe that the adoption of OER in a large scale is the most important public policy for the next decade.”<sup>9</sup>

This statement addresses concerns regarding learning through students’ realities. Some pedagogical approaches argue that it is important that pupils learn from their reality. Immense cultural differences in children’s backgrounds and realities are usually not reflected in didactic books, which are frequently produced by publishers from São Paulo and Rio de Janeiro, though distributed to all cities in Brazil. Thus, this claim from the Secretary of Education takes into consideration that a child in the city of Manaus, 2,700 km away from São Paulo, may find it difficult to understand a given content with references from another city. Adapting, for instance, the content to their own transportation methods (in Manaus, buses and boats could better convey a message than a subway, still non-existent in the region) could be more effective by taking into account regional differences. This approach is usually associated with Paulo Freire, a Brazilian educator and philosopher who developed a framework and the intellectual bases for “critical pedagogy,” widely adopted in Brazil.

The city has already adopted the Creative Commons **Attribution-NonCommercial-ShareAlike licence** (CC BY NC-SA) mandated in the decree in the materials for which they own the copyright. São Paulo’s legal department has been working to adapt the city procurement process adequately.

**Federal Bill No. 1.513/2011** – Federal Congressman Paulo Teixeira, who has a long track record on knowledge access, introduced federal bill no. 1.513/2011. The bill mentions the educational resources produced with full or partial public subsidies. Article 5 of the bill determines that:

“Intellectual works provided for in Article 6th of Act no. 9.610 of 19 February 1998, and specifically those works resulting from the work of public servants in a regime of exclusive or partial dedication, including teachers and researchers in public schools and universities, in the exercise of their functions, when the works are educational resources, cannot be subject to exclusive license to private entities and shall be, under this Act, provided and licensed to society through free licenses.”

The bill also proposes formal government preference for free technical standards, such as free software, and encourages the creation of federated repositories for the storage and publication of OER that meet international standards for openness and interoperability. It has passed through a series of House Commissions but not yet the legislature. In June 2015, a new revision was introduced, simplifying the bill and clarifying the OER mandate for public-funded resources. Later that month, the bill received a favourable vote, asking for the

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9 The pioneer experience of the City of São Paulo: An interview with Alexander Schneider. By Paulo Darcie. <http://www.livrorea.net.br/livro/home.html>.

approval of the bill in the Commission of Culture of the House of Representatives. The bill, when approved, will then move forward for review by the Commission of Education.

Passing a bill in Brazil involves a complex flow and may take years. The process may be longer depending on the legislature and the executive branch priorities, as well as urgency of the matter. There has been no explicit effort against the OER bill initiative so far.

**São Paulo State Bill No. 989/2011** – The state bill of São Paulo no. 989 of 2011 was introduced by State Congressman Simão Pedro after a public conference on OER at the State Legislative Assembly in June 2011. Mr Pedro said (Pedro, 2011):

“The Fundamental Right to education (Article 6<sup>th</sup>, Federal Constitution) can only be fully thought out by the State if, in an ongoing effort, everyone has the opportunity to access the entire modern and inclusive form of education. It also encourages other Fundamental Law, regarding to equality (Article 5<sup>th</sup>, CF). ... The Public administration has a fundamental role in the production of educational resources, both for use in its education system, as in technical-scientific production. ...”

The bill mandates that educational resources developed directly or indirectly through state subsidies shall be made available electronically and freely licensed for re-use, though it does allow for commercial restrictions. The bill, which was approved by the state legislative chamber, was later declared unconstitutional by the governor’s office with the justification that only the executive could legislate on that matter. The OER community representatives in São Paulo tried to challenge that veto with the support of State Legislative representatives, but without success.

Other bills are also under review and legislative discussion is underway in the State of Paraná (bill no. 185/2014)<sup>10</sup> and in the Federal District (bill 1832/2014).<sup>11</sup>

## **Brazilian OER Private or Community Projects**

Over the past years, the number of schools and amount of community-based OER knowledge have increased due to targeted action by the OER-Brazil project, OER volunteers and communities of practice that were formed around it. The OER community has also received support and was able to exchange knowledge and practices with sister communities (such as the open data community and the open government community, which has helped the OER community) to learn about tools to support advocacy.

An example of a joint action was a series of requests for information made on two occasions: first, when the São Paulo State bill was vetoed by the governor; and second, to learn how much public money was invested in the purchase and

<sup>10</sup> <http://www.rea.net.br/site/politica-publica/projeto-de-lei-do-estado-do-parana/> and <http://portal.alep.pr.gov.br/index.php/pesquisa-legislativa/proposicao?idProposicao=47942>

<sup>11</sup> <http://www.rea.net.br/site/politica-publica/projeto-de-lei-do-distrito-federal/>



development of OER materials in São Paulo. These actions involved a series of workshops, specific training, research, meetings with policy-makers, meetings with publishers, and the building of partnerships that are crucial to group efforts.

Beyond policy development and support, the OER-Brazil project mission is also to support awareness-raising and community and institutional-based OER projects. The assumption is that if the community element is not present, the policies will face implementation barriers. Community mobilisation is considered by the project to be essential to push laws arguing for public-funded educational materials as OER. The presence of a strong community contributes not only to policy development, but also to the identification of new advocates that can support the expansion of the efforts in their localities.

The expansion of the community and the understanding of the benefits brought about by the adoption of OER are also vital to motivate the organisational presence of community and institutional OER projects.

Two examples deserve focus, as they clearly illustrate the developments.

**Community-based development of an OER project:**

**IndioEduca** – Indigenous culture and knowledge are usually missing in Brazilian educational content. However, in 2008, a new law made it mandatory for schools to cover subjects on both Afro-Brazilians and Indigenous culture and history. However, most didactic materials are written under the western culture and knowledge perspective, and are created by publishers in the largest cities of Brazil.

To change the reality of the materials available, the non-governmental organisation Thydêwã created, in 2011, the IndioEduca project, supporting the establishment of a repository for content created by indigenous people from over 10 ethnicities, many of them in indigenous languages. The leader of this NGO, Sebastian Gerlic, learned about the initiatives of OER-Brazil and started a discussion on how to deal with any copyright associated with the content, with the goal of making it as widely available as possible while asserting the copyright and origin of the works. For him, OER was a concept fundamentally in sync with the understanding of knowledge by the indigenous communities he was working with.<sup>12</sup>

OER-Brazil's team trained the staff of the project and other community members, and currently the IndioEduca repository is open licensed under a Creative Commons licence. The website states the importance of ICT in bridging the gap between indigenous communities and the society as a whole, as well as ICT's role in the preservation of traditional knowledge.

As a way to increase the repository, indigenous people who attended universities were invited to prepare materials for schools. There are also specific materials to support teachers in the classroom. The content covers subjects from history to rituals and current affairs, such

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<sup>12</sup> OER-Br interview with Sebastian Gerlic of IndoeEduca available at <https://youtu.be/2khE-PeAIOE> and <http://www.rea.net.br/site/portal-indio-educa-festival-da-cultura-digital/> (Dec. 13, 2011).

as participation of indigenous people in politics; the meaning of body images, identity and costumes; geography; statistics; arts; and more. One may find the website written and organised in an unconventional way, as opposed to the commonly indexed content in formal education. But the result is a repository of knowledge that mirrors many of the beliefs of indigenous people, a website that is created by indigenous people for indigenous people and for teachers interested in enriching their classes on indigenous culture.

Over 200 stories have been written and deposited in IndioEduca so far and the website encourages teachers to share their lessons. Under a Creative Commons licence, all content is allowed to be retained, re-used, revised, remixed and redistributed. The project is supported by private and public international funders and by the Ministry of Culture.

### **Institutional-based development of an OER project:**

**READante** – Located in a privileged neighbourhood of São Paulo, Colégio Dante Alighieri is a traditional school founded in 1911. The school has over 4,200 students from elementary and high school grades, and about 700 employees, including 300 teachers. The school is known for its high educational standards and its leadership in incorporating technology innovations into methods and curricula.

In 2011, when the school marked its 100th anniversary, the technology department of the school, with support of the OER-Brazil team, launched READante, a project that aims to encourage teachers to create OER and make them available to everyone in the school and the general public.

Reports, lessons, presentations and dissertations are the most common resources available in the repository, which currently counts over 120 digital educational resources. Most of those resources are licensed under Creative Commons. However, in 2013, a licence that does not allow derivative works (Creative Commons Attribution-NoDerivs [CC BY-ND]) was adopted for part of the resources.

The impact of the READante project can be seen as a strategic step, given the challenges sometimes associated with open licensing. Having Colégio Dante Alighieri, one of the largest and most prestigious schools in Brazil, producing and promoting OER may be key to encouraging other schools to do so. That said, the cultural resistance of teachers and departments to sharing cannot be ignored. With 300 teachers, only 120 digital resources were added to the READante repository — less than 1 per teacher. Still, the project is an experiment that has room to grow and Dante Alighieri has shown leadership in adopting it.

Unlike in countries such as the USA, where government and philanthropic foundations expressly direct finances to OER practices, development and adoption, in Brazil there is no source of specific funding for OER. And, as mentioned, the government, specifically the Ministry of Education, still has to buy

into the concept and implement the procurement process necessary to support OER. Thus, in Brazil, OER are growing based on a strong grassroots movement of believers who are dispersed around the country.

Additionally, the partnerships and coalitions within this grassroots movement are also critical in supporting the creation of an analytical framework for the field in Brazil. Worth highlighting here are the academic research and symposia initiated and co-ordinated by the Núcleo de Informática Aplicada à Educação (Centre of Applied Informatics to Education) at the University of Campinas, the current UNESCO OER Chair in Brazil.

## Impact and Measurement of OER Initiatives in Brazil

The OER development in Brazil is far from ready to be measured. So far, national efforts have been mostly focused on policy and practice development. Only with a larger sample is measurement possible and can reliable indicators be developed. None of the projects mapped by MIRA or OER-Brazil has published statistics of usage and impact.

One of the only projects in Brazil that has been measuring impact is FGV Online.

**FGV Online** – FGV Online joined the OpenCourseWare Consortium in 2008, but at that time did not have a clear policy for the use of its contents beyond the context of a student taking an online course. FGV Online has adopted Creative Commons licensing for some of the courses it offers, but its proprietary platform is a high barrier for the re-use and remix of any of its contents.

The FGV Online platform has received more than 30 million hits, resulting in more than 7.5 million registered students who can also receive and print out a Declaration of Participation (a form of certificate), free of charge, at the completion of a course. (At the time of writing this chapter, there was no other known organisation offering “certificates” for free, open resource, online courses.) From those registered students, over 4.5 million have obtained the certificate by successfully meeting the testing standards. The student data gathered by FGV Online has allowed the university to better understand its public and who benefits from its free courses. The data has shown that 60% of those who complete courses are single women between 25 and 35 years of age; and 88% earn up to USD 1,200 a month and are mainly analysts or junior managers who, in general, could not afford a paid course at FGV. Most who complete the online course have a business educational background, followed by lawyers and other students. About 1.5% of those who completed courses are professors.<sup>13</sup>

**ICT census** – Another effort trying to capture the impact of OER on user behaviour and learning is the ICT census by the Brazilian Internet Steering Committee. A partnership between OER-Brazil, NIC.Brazil and the statistics and research centre of CGI. Brazil posed

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13 Authors interview with FGV Online Director, Stavros Xanthopoulos.

a series of questions focused on awareness and use of OER. The questionnaire found that while awareness about OER is still low, the use of digital content (including multimedia that teachers find online) is high. Teachers mentioned several barriers to online access, use and publishing — all core behaviours of the OER collaborative and co-creation culture. Among those mentioned were fear and lack of knowledge about copyright (69%), bad Internet connections (42%), and lack of knowledge on how to use OER (49%). Only a small portion of those who use online content are aware or take the time to check on the conditions of use or licence under which content is published. Among those who publish online, 49% reported distributing resources under some form of open licence.

Besides legal and infrastructure barriers for adoption of OER, and despite all efforts by the OER community to raise awareness of the benefits around it, Brazil still faces a challenge in building knowledge around the concept of OER and its implementation. Collaborative culture is in place, but very few institutional initiatives provide an appropriate framework for collaboration.

Research carried out by a Brazilian NGO in the education field, Ação Educativa, with the support of the Wikimedia Foundation, found that even those somehow familiar with the concept of OER struggle to precisely define it, and licensing of online repositories does not always meet the standards of open access and OER, as defined by UNESCO or by the Open definition (Venturini, 2014). The researchers mapped and analysed digital educational content repositories and interviewed policy-makers, government employees, private sector representatives and academic scholars. They also covered 22 portals, launched by the public and the private sectors, such as the Digital National Library, Escola Digital, Khan Academy Português, Federação de Repositórios EducaBrasil, M3 Matemática Multimídia, International Database of Educational Objects – BIOE, and Portal Dia a Dia da Educação. One of the most important findings is that licensing is still an issue and no initiative featured clear information about the level of openness of the contents.

Although initiatives were successful in granting online access to educational and cultural contents, a lot of confusion results when it comes to licensing the material. This confusion stems from general statements such as “Copyright: all rights reserved” being on the same website as “this website is under Creative Commons License,” to the use of the Creative Commons brand without specifying or linking to any specific licence. Some websites included works published under different licences but those licences were not shown. Some repositories do not even mention any type of copyright policy or licence (Venturini, 2014).

The researchers analysed a sample of 231 resources available in those online libraries and found that 43.7% were under standard copyright protection, either because that was explicitly expressed (“all rights reserved”) or because there was complete lack of licensing information, which, in keeping with Brazilian legislation, makes any intellectual work protected for almost all types of use. Five other categories were applied to classify the resources and only 37% were under public domain, flexible (including CC BY-NC-ND, CC BY-NC, CC BY-NC-SA) or free licences (CC-BY, CC-BY-SA, CC-0, GPL, etc.) (Venturini, 2014).

Such analysis demonstrates that there are several initiatives aimed at providing OER but no consensus on what openness is and very little knowledge on how to precisely organise and classify the material in order to allow third parties to use it without fear of violating copyright legislation.

Key stakeholders from the public, private and academic sectors were asked about OER. It is remarkable that no representative of the private publishing sector rejected the OER concept when asked about it, and many expressed some level of support for it. Nevertheless, such apparent consensus over OER hides differences in the understanding around this issue. Most people mentioned partial online access to content as OER initiatives. Ten content makers were interviewed and no large publisher had any licensing policy apart from the traditional copyright “all rights reserved.” However, among smaller companies and large digital enterprises, CC BY-NC, CC BY and CC BY-SA licences were cited as recurring in their products.

Within the public and academic sectors, the research pointed to lack of consensus on how open content should be and on what openness indeed means. Some interviewees referred to openness more as a matter of open practices rather than copyright-related issues. Others expressed different opinions on what freedoms should be granted for users in materials funded with public resources. These are granular differences, but may become obstacles for the consensus needed when targeting public and institutional policies.

As mentioned earlier, professors and teachers already make use of digital content, and many times adapt them to their local context. However, very few produce or share modified materials and many will not find a clear institutional environment and framework to share and redistribute without fear of violating the law or of having their own rights violated.

## Conclusions

OER in Brazil sits at a remarkable moment. A multi-year national plan for education awaits implementation just as the Internet sweeps the country. Two OER policies are moving educational materials into the digital commons, fusing policy and technology: one is a massive city-wide decree; the other is a major priority in a multi-year federal strategic plan. Other policies still await approval and government buy-in. An always-increasing number of community and institutional OER practices and projects are emerging. But the impacts have not been measured in any specificity, and they will be influenced by the overall politics of the moment.

OER policy, like all national efforts, will have to work through the multiple contexts and scales of Brazilian education, local culture and practices. In most of the cases, the primary reasons for OER adoption were one of three, as the cases we documented illustrate. To:

- enable local appropriate content to flourish (IndioEduca project),
- ensure public investment accountability and good return for public-funded resources to taxpayers (federal OER bill), or
- incorporate a technology and methodological innovation into the classroom (Colégio Dante Alighieri initiative).

In addition to a variety of challenges mentioned throughout this chapter, the absence of regulation on lobbying activity in Brazil leaves political pressure groups and individuals to act more often backstage with very little transparency. As a result, it may be hard to accurately map all forces acting for or against a certain bill of law or policy, and even harder to find those activities properly documented. Hence, there is almost no record of arguments against OER in the public arena. Even though OER advocates know there is pressure from publishers against new business models,<sup>14</sup> OER experiences have so far not been openly tackled. Instead, other unrelated aspects of a bill may be questioned, as was the case of the State of São Paulo. An unexpected outcome of it may be the development of a positive environment for forthcoming open debates regarding OER in Brazil.

Most importantly, digital OER are adaptable to a variety of systems that change over time, and their costs are paid at the beginning rather than through rent of individual titles over time. OER are also resilient across power outages (allowing for infinite local backups to print and other formats), low connectivity, and non-traditional classrooms. OER facilitate localised content and permit transmission of methods and pedagogy alongside the content to deep rural areas.

Although a relatively new concept, OER are part of the fundamental constitutional, rights-centred promise of Brazilian education. OER enter into a deeply complex landscape across time, space and institutional reality, and as such face many of the same challenges as the dominant national plans for entry. The argument for OER, though, has already shown capacity to unify across many contexts and scales.

Finally, OER are a strong match for the idea of education as a human right — the right to make, the right to learn, the right to translate, the right to share. In Brazil, these rights run deep.

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<sup>14</sup> <http://www.artigos.livrorea.net.br/2012/05/uma-politica-estadual-de-rea-para-beneficiar-professores-alunos-e-o-poder-publico/>

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# Open Educational Resources in Canada

*Rory McGreal, Terry Anderson and Dianne Conrad*

## Abstract

Canada's expertise in Open Educational Resources (OER) is starting to be built on and replicated more broadly in all education and training sectors in the country. This chapter presents an overview of the state of the art in OER initiatives and open higher education in Canada, providing insights into what is happening nationally and provincially. An increasing number of OER initiatives at several Canadian institutions are offering free courses to Canadians and international learners. National open education initiatives include: the federal government's Open Data pilot project; support by the Council of Ministers of Education of Canada (CMEC) for the 2012 Paris Declaration on OER; and Creative Commons Canada. Regionally, the provinces of British Columbia and Alberta are supporting OER as part of major open education initiatives.

## Introduction

Open education requires several elements to work: the provision of activities for educators; the establishment of programmes to support the development of both Open Educational Resources (OER) and Massive Open Online Courses (MOOCs); and the support for research and development initiatives to ensure effective practices. However, despite a growing body of literature and public opinion supporting the economic, social and political benefits of open education, there remains a need for the development and implementation of policies at government and institutional levels in order for OER to become fully active (Dhanarajan & Abeywardena, 2013; European Parliament, 2014; Hylén, Damme, Mulder, & D'Antoni, 2012; van der Vaart, 2013).

This chapter presents a pan-Canadian overview of key government and institutional practices designed to support OER initiatives and enhance openness

in many areas in post-secondary education. This overview maps significant initiatives with the aim of sharing and promoting more vigorous policies designed to maximise OER development using open education practices in Canada.

Canada has important areas of expertise in open education, mostly at the post-secondary level, which is beginning to be built on or replicated more broadly in all education and training sectors. Although no federal government strategy specifically supports Open Educational Practices (OEP) at present, there has been activity at the provincial level in Western Canada.

There are few other signs of any significant initiatives or policy designed to support OER development and open practice-related activity across Canadian governments, institutions or industry. OER development and open initiatives in Canada have tended to focus at the level of individual institutions and concentrate on access and availability issues as opposed to development of practice and policy and/or initiatives to encourage openness.

## **Background and History of OER Development in Canada**

Canada is unique in the world in that it is the only country whose national government has no authority in education. In Canada, education is exclusively a provincial or territorial responsibility. The federal government can, however, intervene in other areas relevant to open education. For example, there is a federal programme underway to promote the growth of the open data movement through a new open data licence (Scassa, 2012). This programme introduces an open data pilot project to businesses and citizens with three streams — open data, open information and open dialogue — supporting innovation and leveraging public information to support commercialisation and research (Government of Canada, 2015).

At the provincial level, the Province of British Columbia (B.C.) has also undertaken open initiatives that provide public access to government information and data, giving citizens opportunities to collaborate on matters such as policy and service delivery. Its open government licence enables use and re-use of government information and data.

The concept and activities of openness are clearly evident in the many Canadian universities and community colleges developing programmes and policies to broaden open access and designing, developing and building learning object repositories. Athabasca University, Memorial University, Concordia University and the University of Calgary are examples of institutions that are becoming more familiar and comfortable with the concept of open access and are actively sharing scholarly research and data through university repositories. They also provide author funding to assist researchers with open access fees; and are working to minimise or avoid open access fees levied by publishers. These universities are also promoting openness through the use of Canadian Creative Commons licences.

Athabasca University (AU) has been a leader in OER and is sometimes referred to as Canada's "First OER University." AU was also the first Canadian institution to adopt an open access policy in 2006 (revised in 2014) that recommends that faculty, academic and professional staff deposit an electronic copy of any published research articles, which have been elsewhere accepted for publication, into an AU repository. In 2009, the University of Ottawa adopted an open access

programme supporting free access to their scholarly research. Some of the initiatives in its open access programme include: a promise to make accessible for free, through an online repository, all its scholarly publications; an author fund designed to minimise open access fees charged by publishers; funding for the creation of digital educational materials accessible by everyone online, for free; and a commitment to publish a collection of open access books and research funds to continue studies on open access.

Open initiatives also include support for open university presses, such as AUPress at Athabasca University, and limited open titles from the University of Ottawa Press and other university presses.

Other universities are following suit. The University of Toronto/OISE, for instance, adopted a formal policy on open access in March 2012 (OISE, n. d.), referencing the Open Data pilot, a Government of Canada initiative.

Nonetheless, while the concepts of openness and open access appear to be gaining considerable ground and apparent endorsement by government, their growth, similar to that of OER, is threatened by a lack of public funding.

Although openness can be seen as a growing trend, specific or detailed Canadian OER initiatives in many sectors are difficult to isolate. Few Canadian institutions are visibly working on open practices and/or policy development, although the western region of Canada does have real projects and initiatives in progress and is engaged in assembling, developing and using OER.

Still, some initiatives that support the notion of OER growth and acceptance do exist at a national level. These are discussed below.

## OER Initiatives in Canada

The OER movement in Canada can be categorised in different ways, from type of initiative to geographical location to institutional initiative. The initiatives described below are categorised accordingly.

### Pan-Canadian OER Initiatives and Organisations

- **Open Data** – The Canadian government has initiated an Open Data pilot project using an open government licence, which is similar to the Creative Commons Attribution-NonCommercial licence (CC BY-NC) allowing for remixing and non-commercial uses. And, in April 2014, Industry Canada launched Digital Canada 150, which aims to support “connecting, and protecting Canadians, economic opportunities, digital government and Canadian content.”

CANARIE is a federally funded corporation that is “a vital component of Canada’s digital infrastructure supporting research, education and innovation” (CANARIE, n.d.). Along with National Research Council Knowledge Management and the Canadian Association of Research Libraries, CANARIE supports Research Data Canada in “ramping up” its activities to meet researcher needs in the co-ordination and promotion of research data management. The strategy includes developing open science

and open data to facilitate open access to publications and related data resulting from federally funded research in easily accessible formats.

- **Creative Commons (CC) Canada** – Born of the global open education movement, the creation and use of OER benefits from the development and use of Creative Commons licences, which provide the legal framework to share these resources. A non-profit organisation, CC Canada supports a legal and technical infrastructure for openness. It has created a set of free licensing tools permitting authors and developers to share, re-use and remix materials (including, but not limited to OER) with an explicit “some rights reserved but others clearly allowed” approach to copyright.

As an affiliate of the larger body, CC Canada is a collaborative initiative made up of the Samuelson-Glushko Canadian Internet Policy and Public Interest Clinic (CIPPIC) at the University of Ottawa, BCcampus, and Athabasca University.

In addition to helping users choose licences and find Creative Commons-licensed work, CC Canada is a proponent of open government and the philosophy that government data should be accessible, shareable and reusable under open licences by everyone. It is actively involved in this pursuit, studying how Creative Commons licences can be used by governments to make data available freely for public use. Another CC Canada project is being spearheaded by its legal team at CIPPIC, which is researching the development of user-friendly tools that will provide comprehensive knowledge to users on how to analyse and use different open licences. CC Canada has also launched a series of conferences (or salons) across the country to raise awareness of Creative Commons and its potential among different constituencies, including educators, writers and artists. In May 2014, Robin Merkley, a Canadian, was appointed CEO of Creative Commons worldwide.

- **Council of Ministers of Education of Canada (CMEC)** – CMEC is an organisation of 13 provincial and territorial ministries of education. In response to UNESCO’s 2012 Paris Declaration on OER, CMEC discussed OER for the first time at a national meeting in 2012. The Ministers “reaffirmed their commitment to open access to knowledge and education and to the need to adapt teaching and learning practices to the new realities of the information age” (CMEC, 2012). After further discussions by CMEC, meeting in 2013 in Iqaluit, Nunavut, the Ministers unanimously endorsed the Paris Declaration. This declaration has played an important role in the growing support for OER across Canada and has been instrumental in the establishment of OER initiatives in the three western provinces.
- **Tri-Agency Open Access Policy** – The three Canadian research funding agencies — the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council of Canada (NSERC) and the Social Sciences and Humanities Research Council of Canada (SSHRC) — have agreed on a draft policy supporting open access in scholarly publications. These agencies strongly support knowledge sharing and mobilisation as well as research collaborations domestically and internationally.

## National and International Collaborations on OER Initiatives

There are also several examples of specific OER initiatives in Canada that feature national and international collaboration. OER universitas, particularly, is unique in its breadth and scope.

- **OER universitas** – OER universitas (OERu) offers free online university courses in collaboration with Canadian partners so that learners can gain formal credentials from the partner institutions. OERu is a consortium of more than 36 institutions and several organisations on five continents. It is dedicated to widening access and reducing the cost of post-secondary education for learners internationally by providing OER pathways to achieve formal credible credentials (McGreal, Mackintosh, & Taylor, 2013). There are seven members of the OERu located in Canada: three universities (Athabasca, Thompson Rivers, and Kwantlen); one community college (Portage College in Alberta); and three organisations (BCcampus, eCampus Alberta, and Contact North in Ontario).
- **BCcampus** – BCcampus, arguably the most active collaborative Canadian organisation in the open practices arena, is a publicly funded service that has turned to open concepts and methods to create a sustainable approach to online learning for B.C.'s public post-secondary institutions. BCcampus was created to enhance students' ability not only to identify, choose, register for and take courses but also to apply any academic credits earned to credentials at a selected home institution. It was also intended to benefit institutions through the rationalisation of demand for academic opportunities from students with the supply of online courses from B.C.'s public post-secondary institutions.

BCcampus has been the leader in Canada in promoting OER with CMEC. BCcampus also played a major role in the decision by the B.C. Ministry of Advanced Education, Innovation and Technology to support and implement the Open Textbook Project, which started with a commitment to provide 40 open textbooks at the post-secondary level and is now committed to 60 (BCcampus, 2014). BCcampus hosted a working forum on OER for senior post-secondary institution representatives in Vancouver in October 2012, with the objective of developing a common understanding of what OER could mean for B.C. and building a shared vision of how to develop and use the resources. The session also studied ways that B.C. could take advantage of the promise of OER and, specifically, of open textbooks.

The BCcampus Shareable Online Learning Resources repository (SOL\*R) enables the licensing of, contribution to, and access to free online teaching and learning resources. Notably, in support of OER, other BCcampus initiatives are also underway. These include the implementation of an OER initiative around apprenticeships for the trades, in partnership with B.C.'s Industry Training Authority; and work with the North American Network of Science Labs Online (NANSLO) to build on the success of the Remote Web-based Science Laboratory (RWSL) and open educational science courseware.

## Institutional OER Initiatives

- **Athabasca University (AU)** – There has been, and continues to be, significant OER activity at AU. It was the first university in Canada to join the OpenCourseWare Consortium (now the Open Education Consortium [OEC]) and, as of 2014, remains the only Canadian institutional member. The Province of Alberta and AU were chosen to host the 2015 OEC conference, which was held in Banff with over 250 delegates from more than 26 countries around the world. AU was also given an OEC ACE Award in 2014 for its highly visible OER research website, the OER Knowledge Cloud. As well, AU has made courses and course modules available on its OEC site.

AU is home to the Technology Enhanced Knowledge Research Institute (TEKRI) and the UNESCO/COL/ICDE Chair in OER, both of which promote research into, and the implementation of, OER at institutional, national, and international levels. The OER Knowledge Cloud was created as a goal of the Chair initiative. The OER Chair is also a member of the board of the OER Foundation, which hosts the OER universitas (OERu).

AU's adoption of open access began with the creation of the scholarly journal *International Review of Research in Open and Distributed Learning* (IRRODL) in 1999, and continued in 2005 with the implementation of AUspace, a DSpace repository of scholarly articles, theses and other documents produced within the AU community. In addition, Athabasca's AUPress was the first open access university press in Canada, starting in 2010, and currently offers over 100 volumes. Other AU open initiatives include participating in workshops and conferences, conducting a mapping of open educational activities with POERUP and eMundus Europrojects, and supporting GO-GN, the Global OER Graduate Network.

- **Thompson Rivers University (TRU) Open Learning** – TRU houses the former BC Open University as its distance education wing, called TRU Open Learning. It is working with several OERu partner institutions providing initial prototype courses to be released as OER. TRU Open Learning, like AU, has a robust system for prior learning assessment and recognition (PLAR) that includes challenge examinations and transfer of credit. This makes it a key partner for OER initiatives nationally and internationally.
- **OCAD University** – The Inclusive Design Research Centre (IDRC), a research and development centre at OCAD University in Ontario, consists of an international community of open practice advocates. The learning technologies and products that have been developed and distributed by IDRC are distributed under the GNU General Public Licence. This means that the code is open source and requires users to share products with the same liberal licensing as they have acquired it.

A key project, FLOE (Flexible Learning for Open Education), is currently one of the IDRC's biggest initiatives. It has received substantial funding from the Hewlett Foundation and the European Commission. FLOE takes advantage of the fact that the centre has a set of curricula that is openly licensed and can be repurposed and re-used to make content accessible. This makes FLOE heavily dependent on OER, which presents an optimal

learning environment to meet the needs of all learners, including those with disabilities. FLOE advances the strengths and values of open education and encourages pedagogical and technical innovation. It also promotes OER for their content portability, ease of updating, internationalisation and localisation, content re-use and repurposing, and more efficient and effective content discovery. FLOE's work is international and broad. For example, to support adoption in Africa and other areas where mobile devices are more prevalent than Internet access, FLOE creates tools and services for delivery as OER via audio, text messages, and the small screens found on popular cellphones. These same tools and services are intended to support accessibility through inclusive design.

- **Contact North/Contact Nord (CN/CN)** – CN/CN is Ontario's distance education and training network. It works to provide programming from public colleges, universities and schools with a focus on smaller towns, rural and remote communities. In 2011, Contact North published "Open Educational Resources (OER) Opportunities for Ontario," a major position paper on OER that "set(s) out the case for the implementation of an Ontario OER initiative" (Contact North, 2011). Contact North has also published an OER primer as a video series.
- **Téléuniversité du Québec (TÉLUQ)** – TÉLUQ's policies on the dissemination of educational resources are presented in "Politique de gestion de la diffusion des ressources d'enseignement et d'apprentissage" (REA). These policies relate to learning content in general and could include OER, but are also designed for proprietary content. Because TÉLUQ faculty retain the intellectual property of all original material they produce for teaching, institutional policy has limited impact on what professors do with their material. Laboratoire en Informatique Cognitive et Environnements de Formation (LICEF) is a research centre at TÉLUQ, and hosts the Banques des ressources éducatives en réseau (brer), a repository of French language OER.

## A Movement Towards OER Policy

**Tri-province MOU (Alberta, British Columbia and Saskatchewan)** – The most important development in Canada for the open movement to date has been the tri-province Memorandum of Understanding on Open Educational Resources. The three western provinces of Alberta, British Columbia and Saskatchewan have agreed to co-operate on the development of common OER. This agreement includes co-operation among the provinces in: sharing and developing OER; identifying, sharing and encouraging the use of OER; and, through using technology, fostering an understanding of OER issues. The MOU initiative was led by the B.C. Ministry of Advanced Education, Innovation and Technology and influenced by BCcampus, as described above. The role of each other partner province is outlined below.

Following from the 2012 MOU, the Alberta Ministry of Advanced Education and Innovation announced an OER initiative, pledging CND 2 million for OER development, promotion and sharing. This programme provides publicly funded post-secondary institutions in Alberta with support for the assembly,

use, development, implementation and evaluation of OER to support teaching, learning and research.

Previously, Alberta, without making direct commitments, had been actively supporting OER-related initiatives for several years. In 1999, the Campus Alberta Repository of Educational Objects (CAREO) was funded to promote the sharing of open learning resources within Alberta. Unfortunately, these initiatives were not funded after the initial investment and were eventually closed. Another limited project that still exists is the Alberta Core (Collaborative Online Resource Environment) and the LearnAlberta.Ca site at the K-12 level. These are limited quasi-open initiatives, restricting the openness on some resources to provincial or institutional teachers, students and parents. The CanCore Learning Metadata Resource Initiative was yet another early open education initiative in Alberta, which resulted in the creation of metadata implementation standards for learning objects in 2006.

Through its Access to the Future Program, the Alberta Department of Enterprise and Advanced Education has been financially supporting OER initiatives at Athabasca University. These include a project to promote OER in the university and search out and identify reusable objects for courses and support for the AU UNESCO/COL/ICDE Chair in OER, who is charged with promoting the use of OER institutionally, provincially and internationally.

The government of Saskatchewan, as of June 2014, has been working on an OER open textbook initiative for Saskatchewan's universities and colleges. It has been heavily lobbied by student groups and has been following the initiatives in B.C. and Alberta closely.

**Ontario and Quebec** – Ontario is the province with the largest population in Canada, about 16 million inhabitants. However, to date there is no evidence that any provincial policy related to open practices is being considered. On the contrary, the recently announced Ontario Online, a collaborative Centre of Excellence in technology-enabled learning, does not support OER development; and the province's CND 8.5 million fund for the Shared Online Course has restrictively licensed resources rather than open access content.

Quebec, Canada's only officially unilingual province, differs from other provincial governments regarding copyright protection in education and so has not been inclined to be supportive of OER initiatives. It has a thriving local Francophone cultural industry, unlike the Anglophone provinces that tend to rely on American cultural imports. The protection of the French language culture in Quebec is of paramount importance and, as such, the Province is much more concerned about protecting its publishers and authors than it is about supporting open content for its educational institutions. Quebec officially and legally uses the term *droit d'auteur* (author's rights) to translate the term "copyright" rather than the more precise *droit de copie* (copy right). This is more in keeping with the European custom of emphasising the rights of the publishers and authors over the rights of learners and other consumers. The Membres du Comité sur le droit d'auteur de l'Association nationale des éditeurs de livres (Members of the committee on author's rights [copyright] of the National Association of Book Editors) have been particularly vocal in expressing their opinions in support of strict copyright



regulations. And the Quebec government, of all the provincial governments, has been alone in wanting to limit the fair dealing exemption to copyright.

However, perhaps stemming from a recommendation by the Organisation internationale de la Francophonie, whose conference was hosted in February 2013 in Moncton, New Brunswick, Canada, there is renewed interest in Quebec to promote *des ressources éducatives libres* (i.e., OER). The Ministère de l'Éducation, du Loisir et du Sport du Québec is financing the website brer (banques de ressources éducatives en réseau), which hosts French language OER. THOT CURSUS is another Quebec organisation that has implemented an OER repository accessible through a website.

## **MOOCs**

MOOCs grew out of the open education movement and, as such, represent an important part of the OER landscape. Yuan and Powell (2013) describe how MOOCs developed out of the open education, open source, open access, OER movements, although there are also commercial versions of MOOCs now in operation, such as Udacity and Coursera. Weller (2014) sees MOOCs (at least the non-commercial ones) “as part of a continuum” that proceeded from open source, to open access, to OER, and then to open practices. MOOCs provide perhaps the clearest case for the argument that openness has been successful.

Despite their “open heritage” many MOOC suppliers specifically do not open or licence the student learning content created or used in the MOOC. This transfer of ownership of copyright material from university or faculty to commercial MOOC suppliers can be a source of friction. Furthermore, the restriction of access to materials results in less optimal re-use or adaptation of MOOC content than wished for by many educators.

### **MOOCs' Canadian Roots**

MOOCs are Canadian in origin. The name dates to an experimental course led by George Siemens at the University of Manitoba and Stephen Downes at the National Research Council in 2008 (Tamburri, 2014). They taught a regular online university credit course, “Connectivism and Connective Knowledge” (Downes & Siemens, 2008), with 25 students; and more than 2,200 additional learners joined the course online. As Siemens reports, this course, delivered in 2008, was the first MOOC to combine open content with open teaching. This concept was developed from the idea of an open Wiki pioneered by David Wiley at Utah State University and an open session on social media in which international guest experts led discussions, implemented by Alex Couros at the University of Regina (Siemens, 2012).

“The MOOC is open and invitational” (McAuley, Stewart, Siemens, & Cormier, 2010). Anyone can participate and learners determine for themselves the extent of their participation. This decision may be based on personal interest, workplace requirements, academic goals or other reasons. This level of openness allows many people to participate who may otherwise be unable to access learning.

In 2011, Sebastien Thrun at Stanford University delivered a MOOC on Artificial Intelligence to more than 100,000 learners. However, this MOOC was more teacher-centric than Siemens and Downes' original connectivist MOOC.

**cMOOCs and xMOOCs** – Downes coined the term cMOOC to describe the original course: the “c” stands for “connectivist.”

The goal of cMOOCs was to use the Internet to create an extended network of learners who, while generating content and reflections, learn from one another. David Cormier at the University of Prince Edward Island is continuing this tradition with a pre-university level MOOC, ExperienceU (or XPU). On the other hand, Downes labelled the new instructivist courses xMOOCs (Downes, 2013). Recent xMOOCs continue to export the “sage on the stage” lecturing model of classroom learning to the online world (now delivered largely by video clips).

xMOOCs have become the predominant form of MOOC delivery in Canada, with more than 320 currently being offered by Canadian institutions or individuals. Most of these courses are provided by top-tier traditional institutions using the commercial Coursera platform (McMaster University, University of British Columbia, University of Toronto) or the non-profit EdX platform (McGill University, University of Alberta, University of British Columbia, University of Toronto). Others, mainly middle-tier institutions, use the openly licensed CanvasNet platform (Dalhousie University, Royal Roads University, Athabasca University, University of Saskatchewan). Udemy is a for-profit company that hosts a platform for independent instructors who offer their own MOOCs. To date, there is only one such course delivered from Canada. Wide World Ed is a Canadian grassroots organisation that has tried to implement some homegrown Canadian MOOCs “for the public good” — but with limited success. There are also several self-published MOOCs. (See <https://www.mooc-list.com/countrys/canada>.)

## Development of MOOC Culture in Canada

There are several identifiable bastions of MOOC activity in Canada:

- **Athabasca University (AU)** – As previously noted, AU faculty were significant contributors to the first MOOC in 2008. Following that, AU faculty members George Siemens and Rory McGreal (one of the authors of this chapter) delivered the university's first cMOOC in 2013 on open education. This course could be described as an “embedded” MOOC because it was based on and delivered a for-credit Master of Education course in AU's Centre for Distance Education. The MOOC learners followed the same course materials, but they were separated from the enrolled students. However, the experiment proved unsuccessful as synergies between the two groups suffered from the separation. In 2015, the AU MOOC “Learning to Learn Online” was delivered to more than 3,000 learners.
- **Commonwealth of Learning (COL)** – Based in Vancouver, British Columbia, COL is charged with promoting open education throughout

the 53 countries of the Commonwealth. In 2013, in collaboration with the Indian Institute of Technology, Kanpur (IITK), COL delivered a MOOC on “Mobiles for Development” to more than 2,000 learners from 116 countries, including many non-Commonwealth countries (e.g., in Eastern Europe) using a modified model of the cMOOC on Sakai’s open source platform and developing appropriate OER as YouTube videos (Reporter, 2014). COL’s MOOCs for Development Project has been very successful and the MOOC “Mobiles for Development” received the Open Education Award 2015 under the category “open MOOC” from the Open Education Consortium.

Meanwhile, COL announced the launch of a MOOC Platform as a service to developing countries of the Commonwealth. The platform is based on the mooKIT, developed by the IITK, and can be used by institutions to deliver MOOCs within a short time (less than an hour) and be customised for immediate launch. The platform comes with a student registration management system (up to 10,000 sign-ups), a full-fledged forum for multiple threads, a module to receive audio via phone (should video streaming become difficult), a learning analytic module, a document repository for reading materials, and a module to produce a variety of tests. Most important is the advanced integration of Twitter and Facebook with this platform. Learners can access all the discussions via the Twitter or Facebook accounts and post their queries and comments directly from these social media spaces (personal communication, V. Balaji, COL).

Alberta’s largest university, the University of Alberta, is a bi-modal institution. It delivered Canada’s first xMOOC, “Dino 101: Dinosaur Paleobiology,” in 2013. This offering could also be considered a type of embedded MOOC as it provided two options: a free, non-credit learning experience or a paid, for-credit course.

Access to content on the Internet, either as an OER or otherwise open content, and the emergence of MOOCs as a recent phenomenon have opened up opportunities for learning for users, not just in Canada but internationally. This new type of learning raises the question that is being addressed by the OERu: How can this learning be recognised?

Canadian open institutions such as Athabasca University and Thompson Rivers University have a history of assessing and accrediting these informal modes of learning, through portfolios and systems of prior learning assessment and through challenge-for-credit examinations:

- The recognition of prior learning (RPL) or prior learning assessment and recognition (PLAR) represents another facet of openness in that it is another way that students can gain accreditation and credit for learning. Adults can work towards and earn degree credit for their learning from several universities in Canada (e.g., Athabasca University, Thompson Rivers University), drawing on their non-formal learning (training and participation in workshops) or informal and experiential learning gained from the workplace or other life experiences. Achieving formal credits in this way can reduce the number of courses that a student needs to complete a degree programme and also cut times and costs. On the downside, as is also the case with other nods to openness, RPL/PLAR processes are not as yet widely recognised among traditional institutions.

- Challenge for credit, another way in which some institutions evaluate student learning, can also be considered a form of RPL/PLAR. Challenge for credit consists of a challenge examination or other form of assessment, allowing students an opportunity to demonstrate their proficiency in the subject matter and skills of a specific course without actually taking the course. Credit transfer among Canadian institutions is also becoming more widely accepted, thus promoting virtual mobility.

## Conclusions

In this chapter, we have documented efforts, policies and programmes that are designed to address: innovation; visibility of adoption by others; and the capacity for potential adaptors to make trial applications of the innovation (Rogers, 2003) in the public post-secondary sector. Specifically, we have focused on the action of governments and institutions to provide incentives for the development and trialing of OER in the form of textbooks and scholarly publications and the development of the open education movement that supports MOOCs.

Efforts by research funding organisations, open scholarly presses, and research databases have been designed to determine and demonstrate relative advantages of open education from both pedagogical and economic perspectives. In large and complex countries with diverse educational institutions — especially in a confederation such as Canada, where, as previously mentioned, each province and territory has total autonomy in education — it is difficult to be aware of the many varied practices and policies that are emerging. While other countries can develop national policies, it is possible in Canada to develop trans-Canadian provincial and territorial partnerships, but these operate without national government involvement.

The implementation of open education in Canada remains in its early stages. However, the growing interest in MOOCs, the recent OER initiatives, and the inter-provincial partnership MOU in Western Canada could well be harbingers of future co-operative and collaborative developments, placing Canada on a fast track to national collaborations, policy and standards in open education.

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# Caribbean Open Textbooks Initiative

*Neil Butcher, Andrew Moore and Sarah Hoosen*

## Abstract

This chapter considers both the role that Open Educational Resources (OER) can play in supporting school-level pedagogical transformation, and the policy approaches to initiate transformation in public school systems. Focusing on the context of Antigua & Barbuda, the chapter recognises that, for change to be effective, it needs to be driven at the systemic level, as this ultimately directs most public school systems' operations. The chapter explores different steps taken, starting from the government's commitment to information and communication technology (ICT) infrastructure, fostering a supportive policy environment, and developing a school ICT integration plan to ensure schools' ICT needs and requirements. It describes the deployment of an OER Virtual Learning Environment (VLE) prototype, and the compilation of an online mathematics "textbook" from available quality OER. The chapter concludes by highlighting the kinds of systemic actions important for the proponents of OER to use in building sustained pressure for long-term, educationally effective systemic change.

## Introduction

In the Caribbean, the development of an open textbook prototype arose from regional policy workshops held jointly by the Commonwealth of Learning (COL) and UNESCO in 2012 and 2013. The goal of this open textbook prototype was to demonstrate that Open Educational Resources (OER) can be cost-effectively harnessed to create comprehensive, integrated multimedia packages of content that can replace conventional textbooks.

However, it was understood that the full transformative potential of OER may not be realised at the school level, as many OER initiatives typically focus on creating openly licensed materials (such as open textbooks) that tend to support traditional

educational models — with the assumption that the underlying curriculum, classroom-based organisational models, and roles and responsibilities defined for teachers are what will best prepare young people for their subsequent entry into society and further education.

The approach thus recognised the imperative of not reproducing a content-heavy, top-down model of education, as well as the need to move away from teacher-centric models in which the student is primarily a passive “consumer” of prescribed educational content and whose main task is to complete standardised assessments in order to receive accreditation.

It was also recognised that, for change to be effective, it needs to be driven at the systemic level — ideally by government-level policy changes, as such changes ultimately direct the operations of most public schooling systems. Such change is difficult, as it requires consensus from a wide range of stakeholders, most of whom are inherently conservative and tend to protect traditional educational models. Likewise, the short-term nature of political appointments inhibits risk-taking in these public systems.

For all these reasons, change was to be incremental in nature so as to create as little disruption as possible and to create buy-in from all stakeholders. Furthermore, this would allow planning for the use of technology as a regular occurrence and not just a once-off event, enabling systems to keep pace with global trends and to learn from and respond to previous changes.

To test this approach, an action research pilot study methodology was adopted. The context was Antigua & Barbuda, located in the Eastern Caribbean, which has a very small secondary school system consisting of about 25 schools. The focus was specifically on mathematics education. The government has expressed commitment to implementing significant systemic transformation in schooling, recognising that the current schooling system is not adequately preparing students for their future, and is especially not yet contributing to the development of new economic sectors.

The research was a collaborative effort between Neil Butcher & Associates and the ICT Unit in the Planning Office of the Ministry of Education,

An initial pilot study was conducted in March and April 2014. Then, building on the lessons learned, a second research phase commenced in March 2015 (due to conclude in October 2015).

Data collection for the action research has been drawn from all mathematics teachers in Antigua & Barbuda who attended workshops and were asked for their opinions. Additional detailed information, however, is being drawn from four schools where pilot projects were run during both research phases. The findings from the research are expected to shape mathematics education for all schools on conclusion of the research.

## **Ensuring the Necessary Infrastructure**

Prior to the pilot, the government took a first step in actualising its commitment to integrate ICT in education. It committed to provide infrastructure to support change through, for example: the Community Computer Access Centres, Mobile IT Classrooms, a One Laptop per Teacher initiative, free Internet access, and



Samsung Galaxy tablets supplied, with free access to mobile 4G LTE connections, to every senior secondary student in the country. This commitment aimed to cover all the secondary schools and not just those targeted by the pilot study. This clearly demonstrated the government's commitment to providing ICT infrastructure, which is a first key requirement for systemic change. However, a new policy environment to leverage the effectiveness of the infrastructure investment was required.

## **Shaping the Policy Environment**

The ICT in Education Policy in Antigua & Barbuda, approved in June 2013, contains a highly ambitious agenda for educational transformation and encapsulates a strong commitment to OER and open licensing. The policy highlights the shifting role of educators, from teaching content to facilitating learning and allowing for self-paced learning. It also articulates how this approach can mitigate drop-out rates and facilitate self-employment.

While this policy is an important first step in leading systemic change, by itself it is not a sufficient condition. Consequently, the next step in the process was to develop a comprehensive new ICT Master Plan to guide future procurement and deployment of ICT in schools. The activities identified within the ICT Master Plan, developed in October 2013, interpreted the policy in ways that promoted educational transformation. A few examples include a requirement that OER be exploited, that government release its education materials under an open licence to encourage sharing, and that senior secondary students have access to their own digital devices.

The new ICT in Education Policy highlights the importance of ensuring that school leaders play a critical role in defining future plans for the use of ICT in classrooms. As part of ensuring that the schools' needs and requirements are central to all future planning, a School ICT Integration Plan was circulated to schools. The aim was to: assess what technology schools already have and whether or not it is functional; define schools' priorities regarding ICT procurement; present plans that schools have for using ICT; understand how schools maintain their ICT; and determine competency levels of staff and their professional development needs.

Therefore, the ICT in Education Policy and ICT Master Plan are modelling a school-centred approach to policy implementation, in ways that, it is hoped, mirror the underlying ethos of the learner-centred approach touted for schools themselves.

## **Promoting Teacher and Student Engagement**

Within this environment, the pilot study action research was conducted to explore how best to adopt new teaching and learning methodologies to encourage greater student engagement and responsibility, and to gauge student and staff reactions to a change in teaching and learning methodologies.

The pilot placed heavy emphasis on harnessing OER to enable student-led content creation, with a long-term view of demonstrating that students can use OER to create self-paced learning environments that significantly accelerate their journey through the formal curriculum.

## OER VLE Prototype for Antigua & Barbuda

The pilot design was influenced by the vision of creating a student-centric learning environment. The plan noted that students should help to develop and work through structured pathways of learning (with associated multimedia content for each subject), developed in a Virtual Learning Environment (VLE).

Initially, the pilot exposed students and staff to a VLE called Canvas and a repository of OER that supported the formal curriculum (discussed in more detail below). An Internet search for appropriate OER was conducted to find quality resources for the pilot activities. An OER repository was added to the Canvas VLE and populated with over 500 openly licensed mathematics resources from 72 different providers. The OER mathematics content providers ranged from large organisations committed to developing quality education materials, right down to individual educators who have released their own useful content with an open licence. Well-known content providers included the CK-12 Foundation, Khan Academy, and Commonwealth of Learning. Content was also added from the Eastern Caribbean's own *Mastering Mathematics* video series.

This content was compiled by a specialist mathematics educator, who organised and sequenced the resources within the VLE component of the prototype so that they responded to specific objectives as stated in the Caribbean Secondary Education Curriculum (CSEC) Mathematics syllabus. Thus, an online mathematics “textbook” was compiled from available, high-quality, free OER.

For the second phase of the pilot the OER were migrated across to the Gooru platform<sup>1</sup> that integrated both the repository and VLE into one seamless experience. The Gooru platform also offers enhanced user-friendliness for educators and students alike.

While the prototype can be used like a traditional static textbook, the OER VLE prototype's real power lies in providing students and educators the tools to manipulate and customise its resources. In addition to accessing and repurposing mathematics content, the prototype also offered automatically marked quizzes and tests, which could be adapted to suit local needs. It was anticipated that the ability to edit the “textbook” to suit personal learning preferences and local contexts would, in time, encourage reflective practices amongst students, teachers, principals and education officers as to the nature of traditional practices and create a demand for more flexible approaches to learning and teaching. Existing open source education tools were used to provide the OER textbook prototype's functionality. Thus, two systems were interlinked: a VLE and a content repository.

### Virtual Learning Environment

The Open Source Canvas VLE and later the Gooru platform have been deployed to offer seamless transition and easy navigation between resources of different formats. Consequently, digital OER worksheets or textbook pages in a PDF or MS Word format could be followed by a streamed YouTube video or an interactive website that contained Java programming. To the user, there was no deviation from the learning pathway clearly indicated by the VLE navigation tools (Figure 5.1).

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1 <http://www.goorulearning.org>



**Figure 5.1: Gooru interface of the homepage for Measurement (Specific Objective 1).**

Both Canvas and Gooru offer good assessment functionality, allowing for the construction and easy adaptation of tests. Both allow public access so that users can bypass registrations, logins and password screens, allowing ease of access to the “textbook.” However, when a class or group wishes to manipulate the “textbook,” the VLE offers customisable permissions that can be set up for individual staff or students. Another piece of functionality offered by the VLE that was essential to the prototype model is the ability to deploy copies of a master course so that different groups can have their own version of the “textbook” to manipulate and develop.

## **Electronic Content Repository**

Behind the VLE user interface is a content repository. It provides functionality for the storage of electronic documents and “tagging” of all OER. The repository stores metadata for all the OER used in the prototype, and every OER collected has been tagged in terms of its relationship to the Caribbean Examination Council’s (CXC) CSEC Mathematics curriculum. This gives student and staff developers looking to rework the “textbook” an initial bank of existing and additional OER to peruse and consider — all linked to the curriculum. The repository’s search facility allows users to search according to curriculum statements, subject topics, service providers and resource formats.

An activity in the second phase of the pilot is to cross-map the CXC CSEC curriculum standards to those of the U.S. Common Core within the Gooru platform, thus unlocking access to thousands more potential OER for teachers to consider when repurposing the “textbook.” An additional function of the repository is to provide a facility that allows the scaling up of the “textbook” so that it can be quickly adapted to support curricula from elsewhere. Additional curriculum taxonomies (from South Africa and Kenya) are being added and mapped against the existing taxonomy to enable linkages to appropriate OER already in the database.

## **Structure and Content of the Open Maths Textbook**

At the heart of the prototype are quality OER and a curriculum structure that provides a framework within which to locate these resources. The CXC CSEC

Mathematics curriculum is aimed at junior secondary or middle school, and covers two years of study. It contains 10 mathematics topics, each with its own set of specific objectives. The topics and specific objectives provided the initial structure for the OER Textbook Prototype and guided selection of the first batch of OER.

Against the structure provided by the CSEC Mathematics curriculum, a small team of content experts selected 517 OER based on whether they cover mastery of the specific objectives. Other selection criteria, included, for example, that resources should:

- be of high quality and accurate, be easy to read and understand by students in Grade 9 and 10, not too text dense, and have clear graphics, illustrations and video;
- comprise a mix of media (video, interactive components, audio and strong visual elements) to minimise text density and appeal to different learning preferences;
- contain a mixture of “voices” so that multiple perspectives and approaches could be presented as options for students to consider; and
- preferably be from a Caribbean context.

It should be noted that while mathematics has been targeted in this research and pilot, the model is easily replicable for any subject where there are sufficient high-quality OER.

The initial layout of the OER “textbook” also included sequencing of materials as an important component of the design. OER were selected so that when users progress through them in the specified order, they will be better able to develop the skills and knowledge described by the curriculum objectives. The initial layout of the OER, however, was always considered to be a demonstration of what was possible and to act as a starting point for student and teacher customisation. The intention was never to be prescriptive or fixed.

Many of the collected OER have built-in activities or interactivity, encouraging user engagement. However, the initial design of the prototype assumed that users should have additional opportunities to assess their progress against the curriculum objectives. For the initial deployment of the prototype, 10 self-assessment quizzes (one for each topic and with a minimum of one question per objective) were developed. Located at the end of each topic, these quizzes were designed to be formative assessments to provide immediate feedback to the user and provide guidance on incorrect responses. However, like the content, the tests were designed to be customisable. Teachers and students can add or delete questions, reword instructions, add additional distractors, and so on. They can even add additional assessment opportunities at different stages of the mathematics topic.

## Deployment Strategies

Three potential deployment strategies have been identified:

- **Minimal Deployment Strategy (public access/teacher reference)**
  - Under this deployment strategy, the OER VLE is accessed using public or guest access to the materials. Resources can be read and used but not

manipulated or changed. This strategy might appeal to self-taught students who wish for quality instruction to supplement their experience. It allows students to work at their own pace through the sequenced OER, using self-assessment opportunities to test their mastery of concepts and skills. In this set-up, the student uses the OER VLE very much like a regular textbook, but also benefits from interactive elements within the OER and the self-assessment opportunities that provide immediate detailed feedback.

This simple set-up can also be used by new or inexperienced teachers who require a source of quality teaching and learning materials, selected and vetted by a senior educator with many years of experience. These new teachers can use the materials either as a reference or as a structured environment for their lessons, where the teachers act as a facilitator or guide through the materials. The OER VLE provides a sequencing of the materials and access to varied formats that will, one hopes, appeal to different learning preferences.

- **Standard Deployment Strategy (contextual repurposing by educators)** – The standard set-up requires teachers to be provided permissions to access and edit a school version of the master OER “textbook.” Under this set-up, users are issued rights that allow them to change the textbook content and activities. This allows the textbook to be manipulated to suit local learning contexts. OER, including teacher’s own notes and worksheets, can be added to the modules, and other resources can be deleted if deemed unsuitable by the teacher. The sequence of the resources can also be changed. Those OER whose licensing allow repurposing can be downloaded, adapted and re-uploaded. Furthermore, teachers can add extra questions to the quizzes or even offer more opportunities for students to test themselves. The unique nature of OER and the development tools built into the VLE encourage this repurposing, which is absent in traditional textbooks.
- **Advanced Deployment Strategy (students as content authors)** – The OER “textbook” prototype’s tools and permissions also lend themselves to more student-centred teaching and learning strategies. Using exactly the same tools as provided to educators in the standard set-up, this deployment strategy allows students to be provided editing rights. Students can then create modules in a way that makes sense to their peers, using examples drawn from their collective experience. As students do not start from scratch, this quickly allows them to acquire the skill or knowledge and then consider how to adapt the module for a new audience.

## Pilot Study

In March 2014, as part of the initial action research, four schools in Antigua & Barbuda were identified to pilot each of the OER VLE Prototype’s deployment strategies with the teachers and students. The pilot schools were provided a set of activities that guided them in using the prototype as per the three deployment strategies outlined above: a basic “textbook,” a tool that could be repurposed to support individual teaching styles, and an environment where students could adapt and write their own learning materials for both themselves and their peers.

To expedite the repurposing of the OER VLE prototype to better suit specific needs, a set of simple how-to guides were developed for the students and staff.

On completion of the pilot, teacher experiences were collected using an online survey. The results suggested that teachers considered a number of different ways to deploy the prototype within their current teaching styles. They enjoyed the access to new digital formats and resources that the prototype provided (particularly video and interactive media), and found it easy to repurpose the course materials to better suit their teaching styles. Additionally, they reported that there were sufficient assessment opportunities for students to measure their mastery of curriculum objectives. They tended to use the prototype as is, but welcomed the functionality to repurpose the prototype and include contextually relevant/localised content.

However, there was also evidence to suggest that the current form of the prototype was not incorporated into daily teaching strategies. Mitigating factors included lack of sustained pressure by the school management/education ministry to use the tool, difficulties associated with accessing computers and the Internet (i.e., access and cost), and complexities in management of the prototype — in particular, generating school instances of the materials and the granting of permissions. Nevertheless, some educators reported that they were keen to upload and share their class materials within the prototype. Statistics from the prototype platform, however, showed that adoption and use was not sustained effectively after the initial launch.

Given this, in 2015, the Maths Open Textbook was relaunched to teachers and students. It was migrated to Gooru, which was considered a more user-friendly platform. The interface allows educators and students to easily repurpose the various sections of the “textbook.” The creation of copies of the master collections (“remix copies” in Gooru’s terminology) is especially easy, and dispensed with complex permission systems that were necessary in the earlier VLE. Another advantage is the seamless integration of both the user interface and the repository, which allows easy navigation around the VLE and linkages to resources. The Gooru platform also offers access to a comprehensive OER collection that is already tagged to the U.S. Common Core.

Teachers were trained to use and manipulate the Maths Open Textbook resident on the Gooru learning platform. They were then invited to repurpose and present their own interpretations of the mathematics content. During this process, it was evident that there was a gulf between educational theory and its implementation. The teaching and learning environment, typical of traditional secondary schools, is often restrictive and conservative and demands high levels of compliance. This environment appears to stifle attempts at creativity and a willingness to experiment. Teachers also appeared to fear failure, and therefore did not take risks by developing new teaching and learning strategies different from those mandated by authority structures. However, when confronted with a new strategy, endorsed by the ministry and therefore in their minds “approved,” both groups — but especially the students — showed willingness to venture into new territory.

To enhance the use of the Maths Open Textbook, it is planned to encourage those teachers who have successfully demonstrated its use to integrate the platform into

their teaching, covering at least 10 specific objectives in any one maths topic. Once they have mastered the Maths Open Textbook, they will form part of the team to help roll out usage on a larger scale.

The second phase of the action research (March–October 2015) includes teachers selecting the section of the curriculum on which they will focus, identifying technology needs and preparing relevant master sections of the “textbook.” During the pilot, teachers will assist with mapping the CXC CSEC and U.S. Common Core standards. This activity is designed to increase the number of existing math OER linked to the Caribbean standards. They have also been tasked to develop a set of case studies describing their experience, both positive aspects and challenges.

One of the outcomes of the pilot has been to identify and train a core of teachers to support other teachers on the island in using both OER and the textbook platform to deliver learning. The pilot will also help the Ministry of Education develop such a strategy to roll out the “textbook” to all the island educators.

Preliminary outcomes of the second pilot study suggest that the user experience has been greatly enhanced using the Gooru learning platform, encouraging adaptation of the “text” by teachers. Additionally, the improved ease of use has encouraged increased student involvement in terms of adapting and improving the OER collections aligned to curriculum statements. However, it has also been evident that the model is dependent on access to digital devices and Internet connectivity. In the early part of the second phase, access for students to both devices and connectivity proved problematic, and subsequently the lessons were a failure. Only in the later part of the phase when access was improved did the study yield positive results.

It is anticipated that with a successful conclusion to the pilot, the OER Maths Textbook will be rolled out to the country’s other 21 schools. The model can also be applied to other subjects. This would support the ministry’s intention, as stipulated in its ICT in Education Master Plan, to use OER to impact positively on transforming teaching methodologies from predominately didactic to more student-centric approaches.

## Conclusions

The work in Antigua & Barbuda has demonstrated that, at the core of the transformational challenge of OER, is the reality that patterns of day-to-day teacher-student interactions are very heavily circumscribed by the formal curriculum — a problem exacerbated by the heavy, and in many instances growing, emphasis on high-stakes examinations that test student success in these formal curricula. Unless key players who hold high levels of influence in these systems — most notably, parents and teachers — can be convinced that alternative models of school organisation can improve (or at least not erode) performance in these high-stakes examinations, social tolerance for any significant systemic change is likely to be negligible.

This is why OER initiatives that simply replace proprietary resources with openly licensed ones, but with no major intention to shift the basic productivity of teacher-student interactions, are so unlikely to lead to any systemic transformation. The experiments conducted have demonstrated a significantly

different application of OER, one that is notably cheaper even than OER textbook initiatives. (Given the vast ecosystem of OER that exists already online, once the VLE infrastructure is established, basic capacities are developed, and models can be shown to work successfully, there is no major additional investment required of any kind.)

While the work done in Antigua & Barbuda is too early to claim success, many important tools are already emerging that might provide a roadmap for effective change. These include:

- proactive, visionary statements of policy intent,
- detailed strategic plans, with clear targets that work towards the achievement of the policy vision,
- budgetary and logistical commitments from government to ensure that ICT infrastructure is universally accessible across the whole system,
- strong engagement with principals and school management in planning the integration of ICT into schools on an annual basis,
- creation, through prototypes, of models that demonstrate the potential for OER to serve a transformative educational agenda,
- strong engagement and professional development to enable core groups of teacher “champions” to lead the process of change, and
- careful evaluation to measure the impact of changes ushered in by innovations as they are introduced.

Thus, while success is far from assured, this case study provides possible pointers to the kinds of systemic actions required so that proponents of OER need no longer chase after “low hanging fruit” that simply reinforces the failed models of schooling. Proponents can, rather, seek to build sustained pressure for long-term, educationally effective systemic change. Such cases attempt to place transformative tools and strategies for stakeholders at all levels of the education system: ministerial, district, school and classroom. Changes at a systemic level are important in effecting positive and lasting change.



# Open Educational Resources in Germany

*Ulf-Daniel Ehlers*

## Abstract

Germany was the only country that, in its response to an OECD questionnaire in 2011, reported that Open Educational Resources (OER) are not expected to become a policy priority in the near future. It also stated that there is enough learning material in digital format. However, OER projects are being implemented in the country and there is a growing interest in making education open and educational materials made available freely on the Internet to students, teachers and schools. Open access is widely used in educational institutions in Germany, and the copyright law allows publicly funded research works to be self-archived in institutional repositories. This is not the same with educational materials, where publishers play a predominant role. With a growing interest in OER in Germany, several projects are emerging from the civil society. In educational institutions, there is a move to think beyond OER and promote Open Educational Practices (OEP) that support the effective use of OER.

## Introduction

In a 2011 survey by the Organisation for Economic Co-operation and Development (OECD), Germany declared that Open Educational Resources (OER) were no priority issue for German education policy and would not be in the near future (Hylén, Damme, Mulder, & D'Antoni, 2012). Access to digital materials had not been perceived as a challenge, and openness had not been perceived as urgent. While open data and open access (OA) in Germany are prominent in public discourse about education and science, OER activities are not often seen. In a major international research report, *Beyond OER*, we concluded that OER in higher education institutions and schools in all European countries, including Germany, are available in principle but are not frequently used.

The study identified the main barriers for using OER: lack of institutional support, lack of technological tools for sharing and adapting resources, lack of skills and time of users, lack of quality or fitness of OER, and personal issues such as lack of trust and time (OPAL Report, 2011). The federal government does promote an information and communication technology (ICT) policy that aims at digitalisation of higher education and schools. However, there is currently no policy to specifically promote OER in the education system.

With OER, the old eLearning question seems to gain new relevance: *If we build it, will they come?* (ASTD/Masie Center, 2001). It still seems to hold true that OER are about sharing cultures rather than increasing access to technologies (Bates, 2015).

In this chapter, we present empirical data which reveal that more than three-quarters of all barriers for using OER are related to the lack of the so-called “supporting components,” such as: organisational support; lack of a sharing culture within organisations; lack of skills, quality, trust or time; and lack of skills for adaption. Only a few issues are related to the availability of technical tools for sharing and adapting resources.

While the samples used in our studies might be subject to self-selection and probably attracted more respondents belonging to the group of OER users, the results reveal an interesting array of barriers. Greater efforts should be made in the future to understand the personal, organisational and environmental factors hindering or enabling the assembly, creation, sharing, use and re-use of OER.

A review of recent literature suggests that a gap exists between the concept of “giving away knowledge for free” (OECD, 2007) and the actual use of free and open resources for teaching and learning. One could argue that the term OER — with its focus on the “R,” the resources — constitutes a renaissance of the belief that in pedagogical scenarios content (resources) matters most.

Research into the critical success factors of open education, however, shows a different focus, one that emphasises:

- a focus on OER usage instead of the resources (Philip, Lefoe, O’Reilly, & Parrish, 2008; Windle, Wharrad, McCormick, Laverty, & Taylor, 2010)
- the need for OER use skills (Beggan, 2009; Conole & Weller, 2008)
- the importance of teaching skills and teaching culture and OER (Beggan, 2009)
- the need for OER quality frameworks and concepts specifically for open resources and open practices (Camilleri, Ehlers, & Pawlowski, 2014)
- the culture’s lack of transparency (McGill, Beetham, Falconer, & Littlejohn, 2010)
- OER assessment and recognition (Camilleri & Tannhäuser, 2013; CHEA, 2014)
- the conflict between research and teaching excellence (Browne, Holding, Howell, & Rodway-Dyer, 2010)
- the shift from the supply to the demand side with OER (Beggan, 2009; Browne, Holding, Howell, & Rodway-Dyer, 2010; McGill, Beetham, Falconer, & Littlejohn, 2010)
- learning design as the pedagogical underpinning of OER (Kahle, 2008)

OER are supported by many educational stakeholders, but their use in higher education has not yet reached a critical threshold (Ehlers, 2013). This has to do with the fact that the past — and largely also the current — focus in OER in Germany mainly emphasises the notion of access to digital content. In Germany, teaching and learning materials are easily accessible and largely free of cost for the learners.

There is little consideration about use of OER to support educational practice, and to promote quality and innovation in teaching and learning. German educators therefore stand before the challenge to move from the focus on resources to a focus on their use, along with the Open Educational Practices (OEP). To facilitate this shift from OER to OEP, it is important to outline all factors that are influencing the actual creation, assembly, use, sharing and re-use of OER for learners, educational professionals and organisational leaders, using a common framework. Such a framework would have to be capable of showing a pathway for stakeholders towards innovative, open education in which OER play the role of improving the quality of learning experiences (Fossland, Rye, & Gjerdrum, 2013).

In Germany, responsibility for education lies primarily with the federal states. Thus, in secondary education alone, there are 16 different curricula and five different types of schools. Teaching materials, before they can be offered to schools, have to be approved by each federal state ministry. This is such a difficult and lengthy process that, almost exclusively, materials produced by commercial publishers are being approved at the moment. It looks like the whole approval system is based on the traditional publishing business model: a publisher develops a textbook, modifies it in accordance with a particular federal state's curriculum, gains approval from the relevant ministry, and ultimately offers it to schools. As a matter of fact, in many German federal states, schools are only allowed to spend their teaching materials budget on printed books.

## **The Policy, ICT and Societal Context: Strong Open Access But Less Developed OER and OEP Policies**

The various educational sectors in Germany — schools, Vocational Education and Training, higher education and adult education — have a strong awareness of OA digital materials. Researchers, the federal government and the *Länder* (16 federal states) have initiated several activities to improve OA. The major research organisations and many institutions of higher education have OA policies.

Germany has many institution- and discipline-specific repositories, which are maintained mostly by universities and research institutes. According to the Registry of Open Access Repositories (ROAR), there are 167 OA institutional repositories in the country. The German Initiative for Network Information is supporting a national repository infrastructure. The Directory of Open Access Journals indexes 349 German OA journals. These are hosted by OA journal platforms, research institutions and learned societies.

The major research organisations (Max Planck Society, Leibniz Association, Fraunhofer Gesellschaft, Helmholtz Association) have OA policies. There is a general consensus to encourage publishing in OA journals or depositing results

and reports of research in OA repositories. The most important German funding agency, the German Research Foundation (DFG), has tied OA to its funding policy.

The federal Ministry of Education and Research (BMBF) plans to introduce a similar OA regulation for publicly funded research in Germany. A secondary publication right has been adopted recently to strengthen OA. It has been incorporated in the German copyright Act. Now, scientists and researchers have the legal right to self-archive their publications on the Internet, even if they have agreed to transfer all exploitation rights to their publisher. The regulation applies to results of mainly publicly funded research, 12 months after the first publication, using the author's version. This right cannot be waived.

An initiative to strengthen awareness and openness in access to digital research artifacts is the "Berlin Declaration on Open Access to Knowledge." The Berlin Declaration was initiated by the Max Planck Society in 2003. It has been signed by 53 German institutions, including the German Rectors' Conference which represents 258 universities and other higher education institutions. The DFG provides lump sums for covering publication costs, including Article Processing Charges (APC); and also has a funding programme, Open Access Publizieren, by which universities can apply for funding in order to cover APC by university-based authors.

Since 2010, the DFG has financially supported so-called "Alliance Licences." In these, publishers of journals under such (alliance) licence permit German authors and their institutions to publish their articles apart from the respective journal in OA repositories. Research organisations are funding OA publishing or have membership agreements with publishers on the central payment of APC for publications by their scientists in OA journals.

While there is a strong awareness of OA, the term "OER" is not so well known, and is even less familiar to the average German school teacher or university professor. The simplest reason for this is that there is no good equivalent term in German. Politically active teachers with a keen interest in technology are likely to pick up on the English "OER." However, the majority of teachers in schools and universities are not aware of the huge benefits of OER in their educational practice.

In November 2011, a meeting took place in Bielefeld, Germany, where different stakeholders signed a declaration of interest to disseminate the concept of OER in Germany more intensely. Afterwards, an initiative was founded to harmonise the terminology of OER in the German-speaking context, and to organise the debate about challenges and opportunities in the field of OER. In addition, several smaller initiatives were launched (e.g., the blog [cc-your-edu.de](http://cc-your-edu.de), which provides information to interested teachers about the Creative Commons licences). The first OER-dedicated camp took place in September 2012 in Bremen. In the summer of 2013, the first open online course on OER took place. In the fall of the same year, the Wikimedia Foundation organised the first OER conference in Berlin. The first signs of a changed policy debate are today noticeable at the federal and the Länder policy level. In Berlin, the local government commissioned a study to find out the potential for OER at that level.

In November 2012, an expert meeting was organised between the federal Ministry of Education and Research and the Conference of Education Ministers of the Länder, with the aim of stocktaking and defining the state of art of the debate

in OER in Germany. All invited experts and the policy-makers agreed that OER could be a good complement to all other existing teaching and learning materials. Discussions were led on the controversial issues of quality assurance of OER, business models for OER development and distribution and intellectual property rights. Representatives of publishing houses made a point that free access to teaching materials was putting their business under risk.

Following the meeting, the Conference of Education Ministers started a work group on OER to put forward a position paper by 2015. In 2013, OER was adopted into the coalition treaty at the federal level of the new coalition government of the Christian Democrat Party (CDU), the Christian Social Union (CSU) and the Social Democratic Party (SPD). The position paper stated, "School books and teaching material ... shall, as far as possible, be made available for free, the use of open licenses shall be extended" (CDU, CSU, & SPD, 2013).

German schools and universities in general are very well equipped when it comes to textbooks and learning material. In Germany, there are about 80 educational publishers that produce more than 3,000 new textbooks a year. In addition, while OA in science and research is well developed, the scanning and copying of books and the remixing and e-mailing of materials from commercial books are illegal in Germany. That creates a tension between schools and commercial publishers who, in 2012, tried to launch an initiative to install a software application called "School-Trojan" to control forbidden digitalisation in schools. The increased digitalisation across society and new approaches to teaching have brought the global discussion about licensing of teaching materials to Germany.

At the same time, several initiatives in Germany that support OER have offered OER to schools. Three are described here:

- **Schulbuch-O-Mat** – Schulbuch-O-Mat<sup>1</sup> is a nation-wide initiative by OER-Schul-E-Books to create collaborative, free OER textbooks for schools according to curriculum standards. Started in 2010, it raises money for the textbooks through crowd-funding. Teachers, experts from university and graphic designers work together to produce the textbooks. Since the books are according to the curriculum of the particular federal state, they are regional projects. The initiators of Schulbuch-O-Mat were mainly from universities. The project is also accompanied by an evaluation. So far, two textbooks have been produced by OER-Schul-E-Books.
- **Lehrer-Online**,<sup>2</sup> started in 2008, is a national platform for schools, originally funded by the federal Ministry of Education and Research. The main tasks of Lehrer-Online are the provision of information and teaching material for schools (primary schools, secondary schools, vocational schools). New media for teaching and learning is a strong focus of the programme. Lehrer-Online is part of an online network (<http://www.schulen-ans-netz.de>) financed by the BMBF and, in its first phase, was sponsored by the Deutsche Telekom as well. Now it is led by the company Lehrer-Online GmbH, and financed by advertisements and other services for the federal ministry or other the ministries of the federal states. IT specialists

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1 <http://www.schulbuch-o-mat.de/>

2 <http://www.lehrer-online.de/lehrer-online.php>

and teachers who are knowledgeable on current educational needs also support this portal.

The services of Lehrer-Online include:

- practical teaching modules (including free-of-charge working materials, methodological and didactical articles and suggestions for classroom preparation) which have been developed and approved by teachers in the classroom and carefully developed, researched and validated by editorial staff, both in terms of subject and methodology before being published;
  - a dedicated discussion forum, where teaching professionals can exchange their ideas and experience;
  - an information service specially tailored to users' needs (this includes news about schools, new media and education policy, along with in-depth information on practical legalities such as data privacy and copyright issues);
  - the Virtual Learning Environment lo-net, which offers virtual rooms for collaboration with colleagues and for class teaching and co-operative projects with other schools in Germany and elsewhere; and
  - the homepage generator for primary schools: Primolo, an Internet-based tool that can be used free of charge and enables primary school children, supervised by a teacher, to design their own websites.
- **learn:line** – The media-server learn:line<sup>3</sup> provides OER material in line with the curriculum of North Rhine-Westphalia, the largest federal state in Germany. Material is mainly OER and comes from different sources. It always states the copyright. Teachers only have to register for material from the EDMOND portal, which includes audiovisual material from commercial producers. The download is free of charge once the teachers have registered.

Non-commercial organisations such as Wikimedia<sup>4</sup> and Collaboratory<sup>5</sup> are also great supporters of OER. Most German OER platforms for schools are either small private initiatives or projects supported by federal educational ministries. In both cases, one can be sure that the people providing materials for the platform are activists who do it in their free time. These platforms are not necessarily easy to find (through online Search Engine Optimisation), and they are not necessarily easy to use.

## The Development and Implementation of OER Policy and Initiatives

In 2015, a report was commissioned by the Ministers of Education of the German federal Länder about OER (Bund/Länder AG, 2015). While this was an opportunity to provide a conceptual vision, the report provides 11 pages of definitions, examples and history of the concept of OER. It also provides a way forward with six points:

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3 [http://www.learnline.schulministerium.nrw.de/app/suche\\_learnline](http://www.learnline.schulministerium.nrw.de/app/suche_learnline)

4 <http://www.wikimedia.de/wiki/OERde13>

5 <http://www.collaboratory.de/w/Hauptseite>

1. Support the building up of platforms, registries and repositories to make OER more easily available and in target group specific formats.
2. Improve legal frameworks for sharing and re-using OER on the basis of intellectual property rights.
3. Raise awareness for OER.
4. Inform better about OER.
5. Improve the European and international collaboration on OER.
6. Build a co-ordination point and service desk for OER in schools and lifelong learning

In Germany, the use of OER and OEP are not accomplishing their full potential (Gaebel, Kupriyanova, Morais, & Colucci, 2014). The following factors can hinder or support the use of OER:

- **Cultures of innovation** – Educational professionals within the German education system are not viewing OER as particularly innovative. Rather, there is a skepticism that assumes that resources that are freely available may not be of a particular quality or purpose needed to fit the institutional or individual professor's needs. While there is a group of educational professionals who are using OER as a natural way of assembling resources for educational purposes, they frequently state that the process of repurposing OER in a way that exactly fits their expectation is as time consuming as creating an educational resource themselves.

It also seems that OER and OEP are closely associated with pursuing new forms of facilitating learning for individuals and of customising learning resources to the particular needs of the individual learner (also see Ehlers, 2013). In Germany, educational professionals often associate the use of digital media, and the use of OER in particular, with a changed educational scenario in which they have to promote pedagogical changes, accept the increased autonomy and participation of the learners, accept the changing roles of teachers, and improve the quality of teaching and learning. Thus, OER fall into an innovation trap in the sense that openness is perceived not only to imply using open resources from others but also to mean changing the entire educational approach. This raises the barrier for trials and experiments.

- **Institutional policies for supporting Open Educational Practices (OEP)** – Educational policy-makers view institutional policies for OER as very important. But what is the reality in German organisations?

Explicit institutional OER policies are non-existent. The picture that emerges here is that organisation-wide explicit policies in support of the use of OER are the least prevalent. Only a few institution-wide, strategic efforts have been attempted so far to develop partnerships in order to work on innovative fields such as OEP. One recent example is the University of Hamburg, which collaborated with other higher education institutions in the city to create an open Online University to share knowledge as an OER between the higher education institutions and the citizens of Hamburg.

- **Supporting OER adoption within teaching and learning** – Infrastructure is an enabling factor for the creation and use of OER, as well as for the implementation of OEP. However, we can conclude that although technological infrastructure is an important *enabling factor* for implementing OEP on a micro-level towards creating OEP, it is better understood as a *hygienic factor* (Pegler, 2012). This means that infrastructure is necessary but does not automatically lead to implementation of an open culture in educational institutions favouring OEP and the greater use of OER.
- **Barriers to use OER** – EU-wide research concluded there were 19 barriers to the development and use of OER (OPAL Report, 2011). These are shown in Table 6.1.

**Table 6.1: Barriers to the development of Open Educational Practices (OEP)**

BARRIERS TO THE DEVELOPMENT OF OEP	
<b>Group 1: Barriers with highest relevance</b>	
1.	Insufficient reward system for educational professionals devoting time and energy to OER development.
2.	Lack of policies at institutional level to support the creation or use of OER.
3.	Insufficient support from the management level of higher education institutions.
4.	Lack of policies at national/regional level to support the creation or use of OER.
5.	Lack of interest in pedagogical innovation among educational professionals.
6.	Educational professionals lack the time to create or use OER.
<b>Group 2: Barriers with medium relevance</b>	
7.	Lack of interest in creating or using OER.
8.	Educational professionals lack the skills to create or use OER.
9.	Lack of time to find suitable materials.
10.	OER are not embedded into the learning scenarios.
11.	Lack of OER that are culturally relevant to the user.
12.	Lack of OER in the user's native language.
<b>Group 3: Barriers with lowest relevance</b>	
13.	Lack of quality of the OER.
14.	Not invented here syndrome: no trust in others' resources.
15.	Lack of software to adapt the resources to the user's purposes.
16.	Learners lack the skills to create or use OER.
17.	Learners lack the time to create or use OER.
18.	Lack of Internet connectivity.
19.	Lack of access to computers.

Source: OPAL Report, 2011



- **Benchmarking OER within Germany** – In 2013, the German association Digital Society, the Austrian association Free Networks, and the Swiss association Digital Allmende initiated a project on measuring digital openness, called the Index of Digital Openness.<sup>6</sup> The concept is based on three objectives:
  1. A holistic indicator set intends to capture a multitude of digital initiatives on openness.
  2. A measure of digital openness intends to provide an indication about the entrepreneurs and the forerunners of digital openness.
  3. A regular ranking intends to provide a better way to compare the different initiatives and public efforts to progress on the issue of digital openness (do:index).

The ranking, called do:index, is composed of a five-part ranking that measures the contribution of different areas to the field of digital openness: data, information, knowledge, infrastructure, and learning and teaching materials (OER). Collectively, the rankings contain 60 different indicators in 97 questionnaires. The ranking includes the issue of open education and aims to measure the policy objective to make education more freely available and including OER (Dobusch & Palmetshofer, 2013). The OER questionnaire is composed of five categories: general information about OER; OER-programmes in educational institutions; licensing; lighthouse projects; and any further information.

The results have shown that in Germany there are no OER policies, no funding for OER, and limited awareness about OER.

## Conclusions

In Germany, digital resources are often available and accessible. The challenge is to move from OER to OEP. OEP should be supported more, in policy and in practice (Ehlers, 2011, 2013). OEP are defined as practices that: support the (re) use and production of OER through institutional policies; promote innovative pedagogical models; and respect and empower learners as co-producers on their lifelong learning path (Ehlers, 2013). This is especially crucial for Germany because the general perception is that digital resources are generally available. However, availability is not use, and it can be seen that OER are not often used by educational professionals and not yet supported seriously in institutional policies.

To turn from a focus on resources to practices is also a turn from the notion of accessibility and availability to educational process and learning design.

OEP refers to practices that cover both dimensions of openness in resource usage and creation, and openness in pedagogical models. Both dimensions can help individuals and organisations to self-assess and position their respective context.

It should be noted that a database or repository of OER is not part of OEP. Nor is usage of these OER in a traditional closed and top-down, exam-focused learning environment OEP. However — if OER are used to create resources that are more learner-centred than the ones existing before; if learners are involved in the

<sup>6</sup> <http://www.do-index.org/idee-konzept/>

creation of content that is taken seriously by the teachers/facilitators; if teachers are moving away from content-centred teaching to “human resource”-based teaching; and if learning processes are seen as productive processes and learning outcomes are seen as artifacts worth sharing and debating, improving and re-using — then OER can be seen as part of OEP.

The above considerations emphasise that current OER initiatives could be improved by extending their understanding of OER to include the concepts of quality and innovation for OEP where OER are used. Research and experiences show that the uptake of OER calls for a culture of sharing, of valuing innovative and social network based forms of learning, and of encouraging novel pedagogical models (OPAL Report, 2011). Existing approaches for fostering the use of OER have been focusing on building access to resources. A lack of trust, limited sharing in institutional cultures and low acceptance of OER by educators hinder OER use and access. To set a sustainable pathway for organisations — one in which educational professionals and learners can grow into their role as open educational practitioners — a model for OEP has been developed.

While OER projects can potentially expand access to learning for everyone, they can especially help non-traditional groups of students and, by giving a larger group access to free content, widen participation in higher education. They can also be an efficient way of promoting lifelong learning among individuals, institutions and even governments (in lifelong learning policies), and can bridge the gap between informal and formal learning.

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# Copyrights in OER Publishing in India: The Case of the National Programme on Technology-Enhanced Learning

*Mangala Sunder Krishnan*

## Abstract

Opening up education through the use of information and communication technology (ICT) tools began formally in India with the launch of the *Gyan Darshan* television channel in 2000 by the Indira Gandhi National Open University, New Delhi, and of the National Programme on Technology Enhanced Learning (NPTEL) in 2003 by the seven Indian Institutes of Technologies and the Indian Institute of Science. The government of India funded both of them and copyrights of published materials through these channels have been generally restrictive for some time. The launch of the National Mission on Education through Information and Communication Technology (NMEICT) in 2009, with government-approved funding of USD 1 billion and incorporating NPTEL as its first funded mission project, led to a review of copyrights of Open Educational Resources (OER) in India and brought all NMEICT-funded projects under one umbrella. The result is the adoption of Creative Commons Attribution-ShareAlike licence (CC BY-SA), which is identical to that of Wikipedia for the entire scheme. This chapter traces the development of this process.

## Introduction

The year 2001 witnessed the launch of Wikipedia and Creative Commons. The very next year, the Massachusetts Institute of Technology (MIT), Cambridge, launched the OpenCourseWare website with about 50 courses, which gradually reached about 2,200 courses 10 years later.

In 2002, UNESCO organised the “Forum on the Impact of Open Courseware for Higher Education in the Developing Countries,” when the term “Open Educational Resources (OER)” was coined (UNESCO, 2002). MIT was also among the earliest to adopt an open licensing policy based on Creative Commons. The

first-ever Indian response to recognise OER came from the recommendation of the National Knowledge Commission (NKC) in 2007, which emphasised the role of OER in upgrading the quality of education in the knowledge economy. While recommending the creation of a National Educational Foundation to develop a Web-based repository of high-quality content through a collaborative process, the NKC said “an enabling legal framework that would allow un-restricted access without compromising intellectual authorship must be devised for this purpose” (NKC, 2007).

In this chapter, we present the evolution of the Copyrights Policy of the National Programme on Technology Enhanced Learning (NPTEL) – a flagship programme of the premier Indian educational institutions, supported by the Ministry of Human Resource Development (MHRD), Government of India.

A much more detailed account of the history of NPTEL and its programmes and outreach (and of the design of the largest online video- and Web-based content repository developed to help build higher education curricula) are all described in a separate article (Krishnan, 2013).

## **India’s National Programme on Technology-Enhanced Learning (NPTEL)**

NPTEL was the first online curriculum developed by a group of institutions in India for the Web (NPTEL, 2007). In the Commonwealth, it is the largest provider of OER and highly accessed throughout the world. The contents are helpful not only to undergraduate engineering and technology students in India, but also to others everywhere else in the world. Institutions everywhere can use them as they wish, since course contents are developed in a modular and free way without infringing on existing copyrights of book and journal publishers.

A team of five Indian Institutes of Technology (IITs) and four Indian Institutes of Management proposed a national Technology Enhanced Learning Initiative in partnership with Carnegie Mellon University, Pittsburgh, in 1999, with multiple goals. After several years of deliberations, a project for detailed content creation in 200 topics in five major engineering disciplines was sanctioned by the Ministry of Human Resource Development (MHRD), Government of India, in 2003. The course contents would cover the length and breadth of undergraduate engineering curriculum offered by more than 1,800 institutions in India around 2003. The MHRD asked the IITs to create open educational contents as the first step. Seven of them (IIT Bombay, IIT Delhi, IIT Guwahati, IIT Kanpur, IIT Kharagpur, IIT Madras and IIT Roorkee) and the Indian Institute of Science (IISc; which was included as a partner in 2003) proposed to work together. The main objective of the project was the enhancement of quality of engineering, technology and science education in India.

The project, in its first four-year phase, 2003/04–2006/07, created about 260 courses, with nearly half of them as video. The original proposal did not include producing video-based lecture materials, because online dissemination of large course videos was a challenge in the early years. Also, Web-based learning and free and open online contents were beginning to appear rapidly throughout the world and IITs were keen on implementing a coherent learning strategy through modular course contents and animated and visually enriched subject matter.

The then Minister of Human Resource Development expressed to the team from IITs and IISc that video lectures were particularly important to Indian students for whom the face of the teacher in learning processes mattered. He was also of the opinion that a high bandwidth Internet throughout India was likely to take some more years, while television was already available even in the remotest villages (albeit in one central house or a community centre in many remote villages, where people assembled almost as a social get-together to watch popular television shows).

A 24/7 free-to-air educational channel for technical video lectures, prepared under this project, was launched in 2004 as *Ekalavya* (named after the mythological character who learned archery at a distance). This channel fell within the group of *Gyan Darshan* channels owned by the Government of India. Broadcast quality lectures were recorded in the studios of IITs and IISc with funding support by the ministry. All recording and editing of videos were done in-house to enable the teachers to deliver and edit recorded lectures at their own convenient time. The creation of Web-based content was also done largely in-house to ensure that the authors had complete ownership of the content and would be able to modify it at will. The institutions and the ministry-owned distribution rights. Technologies were learned and improvised in-house to enable the technical and subject matter teams to work together.

## **Copyrights: Changing Mindset**

Broad outreach and access of NPTEL lessons was first and foremost on the minds of the team that built NPTEL. The government kept reminding the NPTEL team that lessons should reach everyone possible without any fee. The authors could not, however, be forced by any regulatory policy to open up their teaching and intellectual ownership to the public at large except through their own publications as books or through journals, both of which had charges for access.

Given the environment of “academic freedom” and expected scholarly work from the faculty in the partner institutions in the project, the subject matter experts were, until then, only obligated to make their academic content free for the students registered in the institutions. There was no definition of “free” such as Richard Stallman’s “free as in freedom” that could be mandated by NPTEL, though it was the principal focus of the project.

Therefore, Prof M.S. Ananth (who later became Director of IIT Madras) suggested to the Government of India that NPTEL would succeed in meeting its objectives of free and open access to quality materials by providing a one-time honorarium to the creators of courses. This would be a token of their time and effort for providing certified and peer-reviewed course contents and, in turn, for obtaining permission from them for uncontrolled access by everyone else in due course as technologies improved.

The Government of India agreed to compensate faculty members with a one-time honorarium that would allow them to transfer their intellectual property to the Government of India, to be used by others. To avoid infringement of copyrights of publishers and material available already on the Internet, the project evolved strict guidelines for the subject matter experts (SME) from the beginning (minutes of NPTEL meetings in the years 2004–2006). Academic institutions

and industry were provided a copy of the entire NPTEL repository after signing a formal agreement with the project office headed by IIT Madras, which required adherence to standard rules for reproduction, re-transmission and modification. Creative Commons had already appeared and there was a wait-and-watch strategy by the Indian government to adopt those policies (NMEICT, 2009). In the matter of copyrights, Prof Ananth kept appealing to faculty members that “service with humility” should be the one and only guiding light for NPTEL. “Common sense” for copyrights was the watchword.

In 2007, when Google and its newly acquired venture, YouTube, approached NPTEL for making the videos public through streaming media technology, some of the Directors of IITs (who are custodians of intellectual property created in their institutes) were apprehensive. YouTube had been banned in many academic institutions in India, including IITs, using proxy server configurations because of its holding objectionable and unedited video contents. Prof Ananth appealed again to all IITs and IISc that adding “non-objectionable content” to YouTube’s holdings was well within the prerogative of the NPTEL team, and when they grew, “good” content would also grow. The argument appealed to everyone to accept sharing of content though YouTube (K. Moudhgalya, personal communication, 2007). Without YouTube, there was no other mechanism in 2007 to distribute taped content that was effective for reaching out to students and teachers in India and around the world.

IIT Madras, along with IIT Kharagpur and IIT Delhi, immediately undertook the mammoth exercise of compressing every one of more than 4,900 NPTEL video lectures in SD broadcast format (about 13.5 GB per hour) into mpeg4 Part 10 at 512 kbps bitrate for Internet streaming and began uploading them to YouTube from November 2007 onwards. A few years later, 3gp for mobile viewing was also made available with the help of a private education service provider, Classle Inc.<sup>1</sup> In addition to these formats, mpeg4 files with a 1.2 mbps bitrate were also available to institutions that wanted NPTEL video lessons for classroom projection screens. The NPTEL YouTube channel<sup>2</sup> hosts currently more than 17,800 video hours and has a channel view of about 142.7 million and a subscriber base of 400,000.

Many users wanted to download videos, but many institutions in India still treated YouTube as a banned entity inside the college campus. The National Knowledge Network (NKN), which was launched by the Ministry of Communications and Information Technology, gave generous bandwidth to IIT Madras for hosting the entire NPTEL video content in IIT Madras and has provided able network support and network security to the site. Thus, NPTEL is synergising the efforts of independent projects arising from two different ministries to ensure that users have multiple channels and access to NPTEL contents from their campus network as well. Mirror sites of NPTEL are being created at several locations to ensure that downloads are facilitated and speedy.

Through conscious efforts of many of its partner institutions and faculty, NPTEL proposed that all its contents be distributed under a Creative Commons Attribution-NonCommercial-ShareAlike licence (CC BY-NC-SA) in 2012. In July 2014, following the OER World Congress declaration in 2012, and with support from the regional centre of the Commonwealth of Learning in New Delhi, the

1 <https://www.classle.net>

2 <http://www.youtube.com/iit>



MHRD formally dedicated all contents generated under the National Mission on Education through Information and Communication Technology (NMEICT) to the citizens of India, removed the NonCommercial restriction and adopted a Creative Commons Attribution-ShareAlike (CC BY-SA) policy (NMEICT, 2014). This was a significant step because it allows commercial developments to be built around NPTEL and other contents, all of which are funded under NMEICT, with the developers sharing one public version freely through the Web.

The NPTEL has since adopted a CC BY-SA policy. The policy has evolved over a time to reflect the conviction of some individuals and the national goals that content be freely shared with large numbers of learners. Understanding and appreciating open licence in the context of legal and moral rights of the authors have been major challenges. Adopting a Creative Commons licence is a commitment, as it is a granting of rights in perpetuity: the licence can be neither revoked nor changed to a more restrictive open licence.

## **Significance of the NMEICT Open Licence Guidelines**

The adoption of CC BY-SA policy by NMEICT is a milestone in sharing educational content at a national level. This is the second instance within the environment of government educational institutions when such a licence was adopted. The first was the National Repository of OER (NROER) hosted by the National Council for Educational Research and Training (NCERT), mostly for school-level educational materials. The guidelines emphasised that the policy of adopting this is “to foster an environment of openness, collaboration and a culture of sharing, reuse and adaption amongst institutions and teachers to enhance the quality of education in the country.” It is also believed that CC BY-SA will help make available non-digitised OER either freely or at low cost, and teachers in remote parts of the country can localise available materials, including translation.

As a result of the guidelines, many other resources besides NPTEL are now available under the same Creative Commons BY-SA licence, not only for citizens of India but for everyone in the world to learn and contribute in a fair and equitable manner: virtual labs; undergraduate educational content in more than 75 subjects; a design programme (E-Kapla); spoken tutorials; courses developed as Massive Open Online Courses (MOOCs) and under NPTEL Online Certification; educational enterprise resource planning software programmes and other software tools developed with NMEICT funds; Brihaspati (a combined learning management system and content management platform); and many new developments that are peer reviewed and certified by experts.

This surpasses all OER developments in the world to date.

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# The Promise of Open Educational Resources in Indonesia

*Petra Wiyakti Bodrogini and Mohammad Rinaldi*

## Abstract

Indonesia began its Open Educational Resources (OER) initiative in 2012 through its active participation in the adoption of the UNESCO 2012 Paris Declaration on OER. This set the groundwork of OER policy. This chapter describes the country's OER programme development, the benefits, challenges and opportunities. The first section lays out the OER policy context, explaining a more advanced law and regulation at the higher education level. The second section discusses how, aside from implementation of the *Higher Education Act*, the Indonesian Ministry of Education and Culture has also released substantial online educational content for basic and secondary education teaching and learning. These materials are paving the way to future progress of OER initiatives. The main benefits are presented in the third section, pointing out that digitalised OER provide evidence of scalability of the programmes, synchronicity with overall ICT in education measures, and ability to conform to “anytime-anywhere” learning. Recommendations for ways to strengthen OER policy and implementation are presented for decision-makers and broader education stakeholders.

## Introduction

Open Educational Resources (OER) are changing the way knowledge is being produced and disseminated. They are fostering the transformation of a profit-driven knowledge society into a free-knowledge society. Furthermore, OER also serve to advance innovation and quality education. In Indonesia, current development of OER initiatives and continuous effort to use and produce OER reveal a promising future for the sound implementation and progress of OER programmes.

Indonesia is among only a few Asian countries that has endorsed, developed and implemented OER (Mulder & Jelgerhuis, 2013). Representatives from the Ministry of Education and Culture (MoEC) attended the World OER Congress 2012 and adopted the Paris Declaration on OER. Higher education has been taking the lead in establishing the foundations of OER regulation and its operationalisation. Basic and secondary education is still to follow suit.

Overall, OER development is underway in Indonesia and a few achievements have been realised. For example, OER programmes include: *Rumah Belajar* (House of Learning) developed by the ICT Centre for Education (or *Pustekkom*) in the MoEC; *Guru Pintar Online* (Smart Teacher Online), a portal dedicated to teacher professional development; and *SUAKA*, an OER portal developed by Indonesia Open University (*Universitas Terbuka*).

Despite the launch of these programmes, OER development in Indonesia is still in its infancy. This chapter provides an overview of the development, benefits and challenges of the major ongoing OER programmes within the Indonesian context. Recommendations on the way forward are provided based on the review.

## The Indonesian Education System

The education system in Indonesia is regulated by the *National Education System Act* (UU No. 20, 2003) which aims at the improvement of access, quality and governance of education system. Indonesian formal schooling consists of basic education from year 1 to 9, secondary education from year 10 to 12, and higher education. Other education forms include non-formal education, informal education, and Islamic education (*Madrasahs*).

The education system is managed by three different ministries: Ministry of Education and Culture (MoEC), Ministry of Research and Technology, and Ministry of Religious Affairs. It is decentralised to local governments (i.e., districts and municipalities). Regular primary to secondary education is managed by MoEC. Higher education, also managed by MoEC before, is now the responsibility of the Ministry of Research and Technology. *Madrasahs*, the formal Islamic education is under the responsibility of Ministry of Religious Affairs.

The scale of Indonesia's education system is significant, as shown in Table 8.1. The country dedicated about 10.5% of its national budget to education in 2015 (Ministry of Finance, 2015).

**Table 8.1. Indonesian education data summary**

Enumerated Units	Primary Schools	Junior Secondary Schools	Senior Secondary Schools	Universities	Total
Education institutions	172,230	53,913	32,003	2,784	260,930
Educators	1,452,361	616,044	392,874	231,752 <sup>a</sup>	2,693,031
Students	24,292,364	8,238,598	6,245,482	6,052,054 <sup>b</sup>	44,828,498
Gross Enrolment Rate <sup>c</sup>	95.71%	78.43%	58.25%	28.57%	

<sup>a</sup> PSDP MoEC, 2013

<sup>b</sup> MOEC, Higher Education Data Warehouse/PDDIKTI, 2013

<sup>c</sup> MoEC, Centre of Statistics and Data for Education/PDSP from Indonesian NER and GER a.y. 2012/2013, 2013.

Source: Ministry of Education and Culture (2014). Centre of Statistics and Data for Education/PDSP, 2014.

## The OER Policy and Societal Context

### OER Policy

To date, Indonesia has fragmented policies in support of OER. A few have addressed OER implicitly; others have explicitly stated OER are needed to enhance education quality. Although the OER programme and practices have progressed, without strong OER policy, achievements may not be sustained or able to bring about organisational change.

As mentioned above, the higher education sector has pioneered the OER initiatives in Indonesia. The *Higher Education Act* (UU No. 12, 2012) stipulates that the government shall develop open learning resources (article 79, point 4). While the term “open learning resources” is explicitly used in this *Higher Education Act* and there might be a possibility of interchangeability of the terms between open learning resources and OER, what the ministry has conceptualised and implemented is OER (Santos, 2013).

Nevertheless, there is no explicit open licensing framework within the *Higher Education Act*. Other relevant regulation is the Minister of Education and Culture regulation concerning a distance education system for higher education (Permendikbud No. 24, 2012). This affirms that distance education is characterised by open and independent learning through the use of digital resources, accessible anytime, anywhere. This policy foundation allows universities to carry out OER programmes more firmly.

A few Indonesian leading universities have begun the efforts, including Universitas Terbuka (Indonesian Open University) (UT), University of Indonesia (UI), Gadjah Mada University (UGM), and Bandung Institute of Technology (ITB). These universities issued their own internal regulation to administer and operationalise OER programmes developed by their own campuses. UT’s Rector Decree (Keputusan Rektor No. 1255, 2012) regulates the open licensing for UT educational materials and types of UT open educational materials. This is a good practice as a national reference, as it protects the intellectual property rights but allows others to re-use and modify relevant education resources for their own teaching and learning activities.

At the primary and secondary education levels, such a policy is to be established. However, the *National Education System Act* has fostered the creation and use of various education resources. This can translate to the creation of OER, in digital and printed formats. A Ministerial Regulation on ICT Governance in MoEC was recently issued. It promotes the use of Rumah Belajar (House of Learning) as a portal for digital education resources to be used by educators, students and the broader education community.

Also, as the main foundation of the promotion of OER in Indonesia beyond MoEC scope, the copyright protection is enshrined in the current *Copyright Act* (UU No. 19, 2002). Indonesia is a signatory of all of the international copyright conventions and a member of the World Intellectual Property Organization (WIPO). In law, copyright is stated as being “the exclusive rights for the creator or the recipient to publish or reproduce the creations or give permission for it by not reducing the restrictions according to the laws and regulations that apply”

(article 1, point 1). The *Copyright Act* respects education and research activity. Article 15 of the law states that use of copyrighted material for research, education and scientific activity and mention of those sources (copyrighted materials) is not considered a copyright infringement. This position, while it may be contested, still provides a window for the development of a common environment for promoting OER and runs parallel to the principles of fair use and fair dealing in educational materials adopted by the law (Dhanarajan, 2014).

Nevertheless, the law may not be sufficient to establish an enabling environment for OER.

### OER Strategy, ICT Context and Policy

OER in Indonesia are intertwined with ICT in education programmes. Although OER can be digitalised or printed, all Indonesian OER are on technology-based platforms. This direction was taken in the Indonesian OER Strategy conceptualised in 2013. The strategy supports an OER ecosystem mainly within higher education campuses. It consists of four main components: people, process, content and tools (see Figure 8.1). These four components are governed by a framework of policies and are supported by infrastructure and resources.

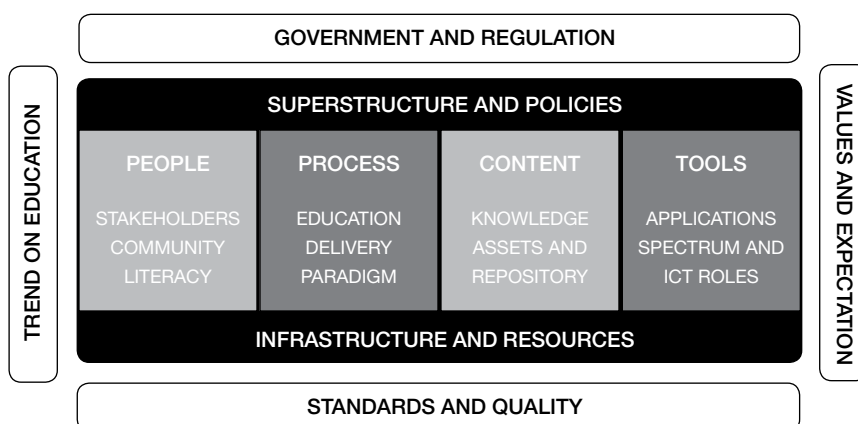


Figure 8.1: Indonesia’s OER Strategy.

Source: Nizam & Santoso, 2013

This OER ecosystem is influenced by external factors such as trends in education, government structure and regulation, standards, quality, and values and expectations. The values and expectations include direct benefits, such as improving the quality of education and increasing student intakes, and indirect benefits, such as making the OER brand stronger and participating in the global movement.

This OER Strategy is supported by the implementation of ICT in education programmes in Indonesia. The use of ICT in teaching and learning has been encouraged, despite the fact that access to ICT has yet to be equally distributed to all teachers, students and schools across Indonesia. Connectivity and the acquisition of hardware (which depends on institutional and financial support),

software and human resources are not yet equally available. The Government of Indonesia has made serious efforts to provide access to ICT, providing hardware, software and infrastructure to all education institutions for more than two decades. Change is happening incrementally, but these adjustments need to be intensified to keep pace with technology's development.

Despite this infrastructure challenge in education, the overall ICT usage in Indonesia is investing rapidly. Internet penetration in Indonesia has increased since the beginning of the century from less than 1% in 2000 to just over 24% in 2012 (or 59.6 million people) (APJII, 2012). At the end of 2014, the number of users grew to 83.6 million — an increase of 15% from 72.7 million in 2013. More than 100 million Indonesian users are predicted to be online by the end of 2015 (eMarketer, 2013).

The APJII 2012 report revealed that Internet users are dominated by people with higher education. Mobile Internet is making gains, aided by the proliferation of affordable smartphones and more affordable data packages. The APJII 2012 report also found that 67.6% of users connect to the Internet through mobile devices. It is predicted that Indonesia will see 71.6 million smartphone users and 8.7 million tablet users by the end of 2015. The majority of these Internet users tend to come from cities and large towns.

In 2013, Indonesia issued a broadband plan to speed up the ICT infrastructure development. This pervasive plan was expected to support the education sector in achieving its goals. The use of ICT in education was emphasised in MoEC's Strategic Plan (*Rencana Strategis*) for 2010–2014, which aimed to provide and improve quality educational infrastructure by strengthening and broadening use of ICT in education. This strategy has been updated in the most current medium-term development plan (*Rencana Pembangunan Jangka Menengah Nasional*) for 2015–2019, which encourages the use of ICT for education, access improvement, quality education enhancement, and education governance.

Regardless of the increasing Internet penetration rate and use of ICT gadgets and social media, the use of ICT in teaching and learning is low. Currently, the ratio of students to computer is 136 to 1. The use of computers in school started primarily for administrative purposes (Pannen, 2014). Several schools, especially private ones and those in large cities, have developed school websites for promotion and communication between the school and its community. However, the application of ICT to teaching and learning activities is prevalent in a few schools, typically highly resourced public and private schools and high-end schools.

Strategically, ICT has been a part of the curriculum at all school levels. Although no specific hours are dedicated at the primary level for ICT use lessons, about 5–10 hours are dedicated for these in junior and senior secondary school. In the 2013 curriculum, the use of ICT was integrated across subjects instead of being a stand-alone course (UNESCO Institute of Statistics, 2014). However, despite this policy direction, there is still a gap in teachers' ICT skills. The OER Strategy also acknowledged that too much emphasis was put on training of how to use ICT, not how to teach with ICT (Nizam & Santoso, 2013). In light of this, MoEC adapted UNESCO's ICT Competency Framework for Teachers (ICT-CFT) in 2012 to set the standards for teacher's ICT literacy, knowledge deepening, knowledge creation and sharing.

## Major OER Initiatives: Current Development and Implementation

OER programmes have been initiated and put into operation by a few major players. MoEC as the decision-maker gave the mandate to the Director General of Higher Education (DGHE), which was formerly under its administration, as well as to Pustekkom (the ICT Centre for Education) to implement OER programmes.

Others involved include Universitas Terbuka (Indonesia Open University, or UT), the Association of Computing and Informatics Colleges and Universities (APTIKOM), and Creative Commons Indonesia. All of these institutions have started OER initiatives, setting important milestones in OER development. These major OER initiatives are discussed below.

### Indonesia Open University's Smart Teacher Online and MOOC

Growing interest in open and distance education was marked by the establishment of UT in 1984 — mainly serving in-service teachers, offering teachers' qualification upgrading, and establishing open junior and open senior high schools. UT pioneered the use of OER, ICT-based distance education for teachers, and ICT-based resource sharing and collaboration (e-books, e-journals, e-library) (Pannen, 2014).

Over the years, UT has continued to develop local open content to support its students and general public. Two of UT's early OER initiatives are Guru Pintar Online<sup>1</sup> (or Smart Teacher Online) and UT's Internet TV,<sup>2</sup> both of which are devoted to improving teaching competence. Guru Pintar Online was developed in 2010, with the support of a project called "Better Education through Reformed Management and Universal Teacher Upgrading," in collaboration with the World Bank.

The objectives of the Guru Pintar Online programme are to: a) provide OER relevant to the learning and teaching process, including regulations on the teaching profession; b) facilitate online communication; and c) promote interaction among teachers. To achieve the objectives, the programme provides three features: learning resources, references, and an online forum for teachers. All of its services are open and regularly updated for teachers or other interested users who would like to enhance their competence in managing the learning and teaching process. To download learning resources and participate in online forums, users need to be registered in the system. The UT's Internet TV streams videos to provide access to audiovisual educational resources for use in enriching OER and fostering different students' learning styles.

In 2011, UT started developing a digital library of e-books, e-journals, course syllabi, course outlines and theses, all available to the general public as OER. In 2012, UT integrated various OER into a single portal called *SUAKA-UT (Sumber Pembelajaran Terbuka)*, literally "open educational resources" (see Figure 8.2).

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1 <http://gurupintar.ut.ac.id>

2 <http://itv.ut.ac.id>





Figure 8.2: SUAKA-UT homepage.

The latest OER initiative from UT is the development of Massive Open Online Courses (MOOCs).<sup>3</sup> Five were launched in March 2014: Public Speaking; Marketing Management; Distance Education; Food Processing; and English for Children. These MOOCs are dedicated to those who would like to have an online learning experience. They also serve as UT's community service programme. More courses are being developed and will be uploaded to the MOOCs repository.

The courses are certified and learners can obtain credits. UT students and the general public can enrol, complete the courses and receive certificates. Anyone who is not a UT student can later use the credits should he or she wish to enrol as a UT student. Currently, UT's OER are using Creative Commons Attribution-NonCommercial-ShareAlike (CC BY NC-SA) and NonCommercial-NoDerivs (CC BY NC-ND) licences. UT is the only education institution in the country that explicitly states its open licence policy regarding use of its published digital OER. The institution does not publish any printed OER for students or the general public, because the online materials can be easily accessed, downloaded and printed for personal use.

## Pustekkom's Digital Resources

Pustekkom, or the ICT Centre for Education in MoEC, has the mandate to set technical policy in the development and use of ICT in open and distance education and to develop educational media for all levels of schooling. To carry out its mandate, Pustekkom has four major OER programmes:

- **Buku Sekolah Elektronik (BSE), an electronic textbook (e-books) programme<sup>4</sup>** – This programme marked Indonesia as one of the first countries to use large-scale open digital resources. The BSE programme started by purchasing all copyright of textbooks from publishers and making them available in digital format for everyone, particularly teachers, students

3 <http://moocs.ut.ac.id>

4 <http://bse.kemdikbud.go.id>

and parents. The e-books are downloadable so that schools can use them digitally or print and distribute them to students. Currently, BSE provides 1,331 titles for primary, junior and senior secondary schools.

- **Rumah Belajar, a portal developed in 2011 as an update of the e-dukasi.net portal**<sup>5</sup> – This portal contains about 13,000 digital learning materials, including multimedia, audio and audiovisual resources. While it does not display any licence for its materials, the contents are accessible by all schools, teachers, students and others in the Indonesian education community.

Rumah Belajar has various features, such as learning resources, a virtual class, continuous professional development, and a curriculum of 2013 books. A notable feature is the education resources, in pictorial, animation, video and audio formats.

The virtual class is to support a more structured and integrated learning and teaching process. It is provided with interactive learning resources, including images, animation, video and animated simulations. The goal is to provide tools for eLearning, to facilitate both face-to-face and distance learning modes of delivery. It is expected that the virtual class will be rolled out nation-wide to be used by all teachers and students. This will increase students' access to education through open and distance learning. MoEC just re-launched the Open High Schools Programme using the virtual class and the education resources from Rumah Belajar. However, this initiative is not without barriers. The government is urged to develop a policy to recognise the learning and teaching process conducted online.

- **TV Edukasi (TV-E) and Suara Edukasi** – These are portals for educational TV streaming of programmes and educational radio, respectively. Currently, Pustekkom has developed more than 9,000 titles of video/televised and audio programmes.
- **Indonesian Integrated Open and Online Learning (*Pembelajaran Daring Indonesia Terbuka dan Terpadu/PDITT*)** – This platform was launched in 2014, linked to the Rumah Belajar portal. Although it is still in its infancy, this marked the Indonesian government's effort to widen the opportunity of providing higher education through a system similar to MOOCs and OpenCourseWare (OCW). Five universities are involved in its development: University of Indonesia (UI), Bandung Institute of Technology (ITB), Gadjah Mada University (UGM), Institute of Ten November Surabaya, and Bina Nusantara University.

All digital contents of Pustekkom are not officially labelled as OER. It has yet to adopt open licensing, and the centre plans to use Creative Commons open licensing in the near future. However, all of these contents are already freely available to all students, educators and others in the education community. During each programme's dissemination, the centre emphasises that these contents are free to re-use and to be modified by users, where this principle is aligned with the disposition of OER.

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5 <http://belajar.kemdikbud.go.id>.

## **APTIKOM's OER Initiatives**

The Association of Computing and Informatics Colleges and Universities (APTIKOM) has been appointed by MoEC to promote implementation of open education in Indonesia. Through a consortium of colleges and universities, APTIKOM has introduced the framework to help numerous stakeholders understand such a movement (Indrajit, 2014).

Research conducted by Nizam and Santoso (2013), under the aegis of APTIKOM, shows that most universities are ready in terms of Internet connectivity and coverage and have a sufficient supply of computers for professors. The universities have also made good progress in using ICT as tools and in digitalising materials. However, they are still not providing incentives for using OER and OpenCourseWare.

## **Open Licensing by Creative Commons Indonesia**

Creative Commons is a non-profit organisation that enables the sharing and use of creativity and knowledge through free legal tools. Creative Commons Indonesia was established in 2012, promoting OER and open licensing based on the Indonesian *Copyright Act* (UU No. 19, 2002). In collaboration with the Ford Foundation and Wikimedia, Creative Commons Indonesia has also done promotional work on copyright and open licensing. Staff have travelled to 12 cities in Indonesia to increase awareness of Creative Commons licensing. As well, they have trained teachers in creating and licensing OER. One of the organisation's milestone achievements is the use of Creative Commons licensing in Indonesia's open data portal.<sup>6</sup>

## **Other Relevant Initiatives**

The Indonesian Telephone Company (PT Telkom Indonesia) has also supported a number of institutions in mobilising eLearning penetration, such as the Office for the Research and Application of Technologies, the Association of Indonesian Internet Service Providers, the Network of School Information, Detik.com and ICT Watch. At this preliminary stage, learning materials have been developed for the subjects of Mathematics, Physics, Chemistry, Biology, Electronics, and Information and Communication Technology (Daryono & Belawati, 2013).

## **Benefits and Challenges of OER in Indonesia**

The adoption of OER has expanded the access to high-quality education resources. The education resources in Rumah Belajar and UT's Guru Pintar Online, SUAKA and MOOCs have reached a significant number of users or learners beyond the classrooms.

Table 8.2 shows a summary of traffic through Pustekom's learning resources portals. Despite its simplicity, BSE has outperformed other available resources. This success is due to the fact that the e-books are required for teaching and learning in schools, not just for supplementary content.

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6 <http://data.go.id>

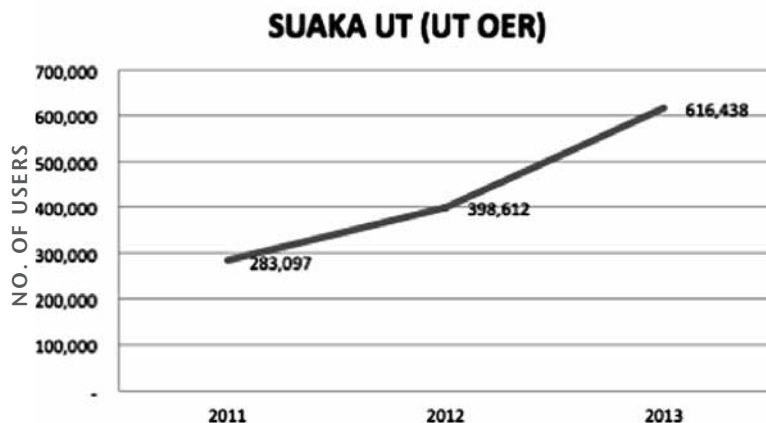
Also notable is that Rumah Belajar reaches almost 7 million users per month. Even taking into account some revisits, this means the portal is receiving about 72 million hits per year.

**Table 8.2: Pustekkom’s portal statistics**

Pustekkom’s portals	Hits/month
BSE (e-books) portals	107,537
BSE (e-books) downloads	18,451,726
Rumah Belajar	6,993,393
TV Edukasi	45,906
Suara Edukasi	43,441

Source: Pustekkom MoEC, 2013

UT’s OER portals are also growing in the number of visitors. While in 2011 the SUAKA-UT portal was only receiving about 283,000 hits a month, in two years’ time it reached over 616,000 users (see Figure 8.3). It is about 10% of all Indonesian university students. Other portals of e-textbooks and thesis repositories have experienced similar success with over 600,000 and nearly 500,000 visitors, respectively (see Table 8.3).



**Figure 8.3: SUAKA-UT statistics, 2011–2013.**

Source: Daryono & Prasetyo, 2014

**Table 8.3. UT's OER portals statistics, 2011–2013**

Types of OER	Visitors
Guru Pintar Online (teacher forum)	1,999
ITV-UT (video streaming)	18,378
TV Broadcast (learning program)	25
Online Supplemental Materials	111.300
Digital Resources	
• e-Text Book Repository	648,755
• Thesis, dissertation, journal, e-book paper	491,409
• Seminar proceedings	109,221

Source: Daryono & Prasetyo, 2014

The OER available on online platforms allow users to access and download at their own convenience. Although not all teachers and students are yet exposed to OER, some educators believe that learning resources such as those in Rumah Belajar are useful supplements in their teaching. Most schools, even private schools, are making use of the official e-books downloaded from the BSE website. These e-books are stored in the school server for easier retrieval and reads. Schools with slow or no Internet connectivity download these e-books elsewhere, and then print and distribute them to students by using the School Operational Fund (BOS).

In spite of the benefits, OER programmes still face a few challenges:

- First are the policy challenges. Without an umbrella policy, the OER initiatives and achievements are vulnerable to even minor organisational changes. Strong policies and regulations will allow space for OER programmes to be systematically planned, budgeted, implemented and evaluated.
- Second, because OER implementation and creation rely heavily on technology platforms, ICT infrastructures are crucial. Electrification to remote schools and distribution of ICT hardware and software need to be accelerated. Pustekkom has piloted the development of ICT-based learning resource centres in remote schools in Indonesia's 17 districts. By late 2013, over 115,000 school were connected. This leaves another 145,000 to be connected. Users need to access the Internet at their own cost, which means individually spending about IDR 100,000 (about USD 7.5) per month for 1 mbps) (PDSP MoEC, 2015).
- Third is the challenge related to building capacity. As stated in the initial OER Strategy, teachers are to be trained to teach with ICT. This means that their ICT literacy must be improved and active teaching and learning with ICT strategies must be widely introduced. The number of teachers in need of ICT literacy training is still being identified by the Teacher Professional Development Agency in MoEC. Once the scale of ICT training for teachers is identified, a more systematic approach to training will be possible.

- Fourth is the challenge of OER quality. Most OER content for basic and secondary education at Rumah Belajar is presented as stand-alone resources, still unstructured. These need to be presented in a way that is linked to learning competency standards.
- Above all is the challenge of OER awareness. Although OER have been promoted at the strategic level, schools are not sufficiently exposed to the concept of OER. Schools both in urban and rural areas are not aware of OER concept and practice, although urban schools have been using available online digital resources, such as Khan Academy material, Rumah Belajar material, and other open content from YouTube. Social awareness of OER must be expanded in the near future.

## The Way Forward

Based on experience to date, as described in this chapter, the following recommendations are put forward. These are of most relevance for Indonesia's ministries responsible for education — MoEC, Ministry of Research and Technology, and the Ministry of Religious Affairs — but also offer a useful reference for other countries implementing OER.

1. **Develop a specific umbrella regulation for OER.** The case that OER have been implicitly included in the *Higher Education Act* (UU No. 12, 2012) is not sufficient. While clarity on open licences is needed, OER should also be implemented for basic and secondary education. An umbrella regulation and policy should encompass the need of all types of teaching and learning institutions managed by the ministries responsible. Although OER have been well received by a majority of scholars, OER practices in Indonesia are still at an early stage of development. OER policy is still fragmented, resulting in a low submission of OER materials. Most scholars tend to devote themselves to becoming users rather than creators. However, their intention to use OER is gaining greater attention as others gain confidence in using OER for various teaching and learning activities.
2. **Enhance the achievements of OER programmes for higher education.** The Ministry of Research and Technology should continue strengthening OER implementation, encouraging all universities to be involved, particularly those administering distance education. As well, a credit transfer system should be started among universities participating in the Indonesian Integrated Open and Online Learning (PDITT) or similar MOOCs initiative.
3. **Enhance awareness of the OER concept and OER development and use.** A full understanding of OER and, more importantly, of copyright and OER good practice in academic contributions, is needed. The main goal should be to raise awareness among the general public and education community as to OER and their benefits. A key element to be included in any awareness-raising activity is the dissemination of open licensing for educational contents, as this needs to be explicitly stated in all available resources. UT has already started to do this, and its efforts should be replicated in other initiatives.

4. **Endorse stronger support from the private sector.** Private technology and telecommunication companies in Indonesia, like all private companies in Indonesia, are obliged to implement Corporate Social Responsibility programmes. PT Telkom Indonesia, PT Microsoft Indonesia, and PT Intel Indonesia Corporation have been supporting the development of technology platforms. These online platforms are being provided freely within the framework of Memorandums of Understanding between MoEC and the companies, and could potentially be used for OER dissemination.

Although OER development is still in an early stage in Indonesia and there is much room for improvement, it offers many sound contributions to the teaching and learning process and to teacher professional development. Attending to these recommendations while promoting OER would be fruitful for realising quality education in Indonesia.

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# Using Open Educational Resources for Undergraduate Programme Development at Wawasan Open University

*Teik Kooi Liew*

## Abstract

Wawasan Open University (WOU) is aware of the accelerating demand for access to affordable higher education and the escalating inflation rate. WOU has therefore intensified its efforts in adopting and adapting Open Educational Resources (OER) in the development of its self-instructional course materials since its first successful endeavour in developing OER-based course material in 2012. Migrating away from the provision of “wrap-around” course material accompanied by a free textbook, to “stand-alone” course materials that are more economically viable, WOU is confronted with another challenge. The stand-alone model requires 12–18 months to complete a full cycle of course material development. This resulted in only a limited number of courses being offered and registered by the learners. This translated into a lengthening of the completion period of the learners and drop in revenue, as well as inefficient allocation of physical and human resources of the university.

To address this constraint, WOU has embarked on assembling, integrating and adapting readily available OER materials under a Creative Commons licence for its new suite of courses, in addition to revising existing course materials. This chapter discusses WOU’s institutional policy on the adoption of OER, its development of quality OER-based course materials, and the costs and benefits that OER presents to the university.

## Introduction

The Wawasan Open University (WOU), the youngest of Asia’s open universities, fulfils its mandate by delivering open distance education. WOU officially opened its doors to students in January 2007. The vision of WOU is to be a vibrant community that inspires lifelong learning, supports innovation and nurtures

all-round personal growth. WOU is committed to the expansion of opportunities in higher education and to teaching excellence aimed at increasing the level of knowledge and scholarship among all Malaysians. Owned by the Wawasan Education Foundation, a charitable, not-for-profit organisation, WOU offers accessible, flexible and affordable education to the community in support of lifelong learning.

Quality underpins everything WOU does. WOU benchmarks its academic programmes, courses, course materials and the entire learning process to produce well-rounded, knowledgeable, competent professionals familiar with international best practices. A distinctive characteristic of the open and distance learning (ODL) system adopted by WOU is that it is learner-centric as opposed to the teacher-centric form of education used in conventional universities. Over 15,000 adult learners in Malaysia, between 21 and 71 years of age, have experienced the learning opportunities at WOU, with the majority of them falling within the 21- to 30-year age group. Most of the learners are working professionals who have to maintain a balance between work, family, personal commitments and studies. With these responsibilities, ODL, which uses a blended learning approach, helps learners overcome the constraint of time and space. The learning management system (LMS) *WawasanLearn* is the main learning platform employed by WOU to equip learners with sound, pedagogically developed, self-instructional course materials and other supplementary materials that are obtained from Open Educational Resources (OER) on the Internet.

In its quest to continue delivering affordable education to learners, WOU has operated on a sustainable business model, supporting a cost-effective culture that embraces technology-assisted teaching and learning excellence throughout the university. One of its initiatives in realising this is to reduce the costs in course material production and distribution by using OER uploaded on the online learning platform.

The following sections highlight how WOU has implemented this initiative while maintaining the quality of the course materials and other related online learning support services.

## **Development of Self-Instructional Learning Course Materials**

Listening and learning about a particular topic from a real-life instructor has been the norm for institutions of higher learning. The instructor assists the learner directly or immediately if the learner shows signs of not following the lesson. In distance learning, however, where the learner does not have immediate access to the instructor, the learning materials become the primary source of information. It is imperative that those learning materials be properly designed to support self-directed learning.

The development of self-instructional learning materials for ODL learners therefore requires careful consideration of the content's suitability and efficacy, especially as the materials aim to reach learners in remote locations or working adults with numerous demands on their time and commitments.

The academic content of WOU’s courses is delivered through its self-instructional learning materials and a comprehensive course guide which advises learners on how to pace their learning to achieve optimal effectiveness. These materials may include textbooks or OER, as well as supplementary learning resources that are provided through the online learning platform. In this way, the course material enables learners to engage in learning activities at any time and from anywhere to suit individual learning styles and needs.

Since its inception in 2007, WOU has gradually migrated its provision of course materials from the traditional print-based form and then CD delivery to a fully digital environment — one in which downloadable PDFs are delivered through the online LMS WawasanLearn.

To ensure the quality of WOU’s course materials, the university has established a framework and policy to guide the design, development and production of all its course materials. In 2013, WOU was bestowed the Award of Excellence for Distance Education Materials by the Commonwealth of Learning to honour the institution’s achievements for designing and developing exemplary study materials.

The course materials process at WOU uses the Course Development Team (CDT) approach:

- Each CDT includes an external writer with subject expertise, one or more internal academics, a course designer and a Web programmer. External writers are used extensively to increase the subject matter talent pool.
- A senior academic at the rank of Associate Professor and above in the same field from another university is appointed as the External Course Assessor (ECA).
- Based on the approved syllabus by the Malaysian Qualifications Agency (MQA), a blueprint is first produced following consultation between the Course Writer and the CDT.
- This blueprint is then reviewed by the CDT and revised appropriately before circulation to the: Librarian (to ensure availability of any texts required, physically or digitally); Information Technology Services (ITS) department (to ensure timely installation of required software); and the ECA for critical review (Figure 9.1).

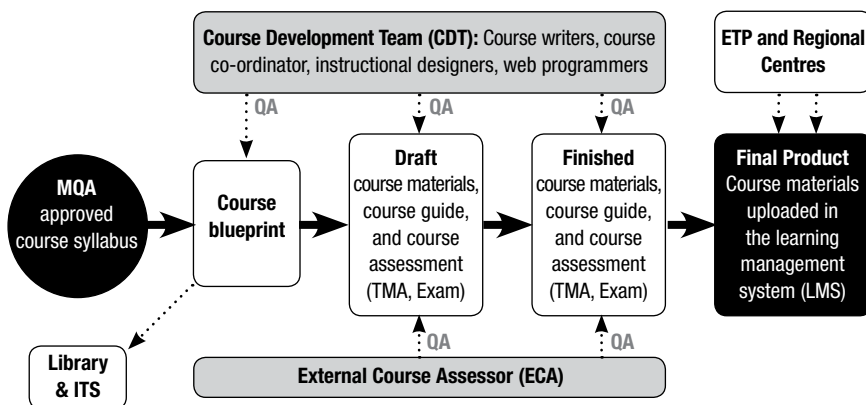


Figure 9.1: Rigorous quality assurance processes in course development.

- Once the blueprint has been accepted, the external writer proceeds to develop the materials, unit by unit.
- The draft of each unit is reviewed by the CDT and then forwarded to the ECA for comments. The written comments from the ECA are reviewed by the CDT and, where appropriate, are included in subsequent refinements. This is repeated for each unit as the development progresses until completion. Multiple iterations between the CDT and the ECA often occur.
- All the revised drafts are then submitted to the ECA to enable the preparation of the Final ECA Report. Detailed minutes are taken for all deliberations and decisions made at CDT Meetings.
- Final drafts of the unit contents, following endorsement by the ECA, are forwarded to the editorial and graphic design staff for further processing, and the final products are signed off by the co-ordinator of the CDT before production.
- At the completion of the development, a Course Development Report incorporating all ECA comments and feedback, meeting notes and so on are discussed at the School Board before the report is presented to the Deputy Vice-Chancellor (Academic).
- The Deputy Vice-Chancellor (Academic) reviews the course's development and examines the final product before making his or her recommendation to Senate as to whether the course materials are ready to be used for presentation to the learners.

All approved self-instructional learning materials for a course are uploaded on the online learning platform by the relevant Course Co-ordinators before the course is presented in a semester. The Course Co-ordinators also populate the online learning platform with other supplementary reading materials, activities, self-tests, quizzes, tutor-marked assignment questions, samples of past year examination papers and so on.

## **Paradigm Shift: Adoption of OER**

The Institute of Research and Innovation (IRI), established by WOU in mid-2010, is committed to exploring innovations in teaching and learning especially in the new technology-enabled and enriched environment. IRI is mobilising funds to support its mission and develop a network of Asian researchers studying OER and OpenCourseWare (OCW) development on the continent.

The IRI of WOU, together with the International Development and Research Centre of Canada (IDRC), has created an online site known as OERAsia. OERAsia is an Asian forum that shares information, views, opinions, research studies, knowledge resources, and guidelines and toolkits on good practices in OER in the Asian region. OERAsia and WOU contributed significantly to the drafting of the 2012 Paris Declaration on OER that was carried out by the Commonwealth of Learning and UNESCO.

Also, in response to a proposal made by the WOU Board of Governors/University Council in December 2010, the board urged the university to consider adopting OER and transforming the existing course development process in order to increase the quality and efficiency of developing materials and to reduce development costs. For this purpose, an OER Steering Committee was established.

The committee, headed by a senior professional with expertise in ODL and OER, was made up of Deans, the Directors of Educational Technology & Publishing and Library & Learning Services, and the Director of Quality Assurance, and a professor was tasked to oversee capacity building. A report entitled *OER Integration in WOU: Policy Directions, Strategic Outputs and Action Plans* was drafted and endorsed by the university at its 30th Senate meeting held on 29 February 2012. The university Senate also later approved a policy paper on OER for adoption (WOU, 2012b).

## **WOU's OER Policy Statements**

WOU is committed to sharing its intellectual property with the education and learning community within the framework of its OER policy. Based on the vision and mission of WOU, the following are some of the policy statements embedded in the WOU OER Policy (WOU, 2012b) that has been formulated and aimed at reducing direct and indirect costs:

- (a) WOU's governing bodies and top management will promote and foster the development and implementation of OER in all teaching and other academic operations of the University through appropriate policy and strategic decisions.
- (b) All academics and academic support staff will:
  - i. inculcate the philosophy and commitment to OER development and practices in the course development and delivery.
  - ii. employ Open Educational Practices (OEP) to help learners acquire competencies for a knowledge society.
  - iii. facilitate the use of tools and services that support collaborative learning practices among learners.
  - iv. engage in the development of OER and support/participate in developing OER repositories.

As stipulated in the WOU-OER Policy, the university continues to promote and implement the creation, re-use, remix, repurpose and redistribution of OER within the open licensing framework. Alongside this, the university also formulated and approved an Open Licence Policy (WOU, 2012c) with Creative Commons BY NC-SA as the licence for courses that will be integrating OER materials.

## **Development of OER-Based Course Materials**

Integration of OER in course development is gaining momentum among academics in the region. The Indira Gandhi National Open University (IGNOU) has adopted this approach to offer the Post-Graduate Diploma in eLearning (PGDEL) through the online mode (Mythili, 2014). The development of OER-based course materials will still be subjected to the rigorous quality assurance process of course development like the one shown in Figure 9.1. In fact, to uphold and ensure the quality of OER at an acceptable standard, two very important aspects are emphasised: identification of the relevant OER materials; and adaptation of the OER materials. These two aspects are monitored very closely when the course blueprint is developed and also when the course writer is producing the draft of each unit of the course.

In ensuring that high-quality course materials are produced, additional quality assurance criteria are applied at two stages of the existing WOU course development process (WOU, 2012). The two stages are shaded in Figure 9.2.

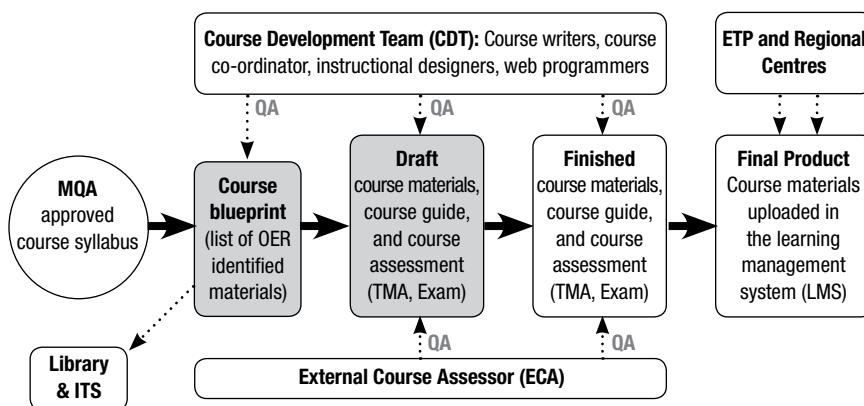


Figure 9.2: Quality assurance intervention in the development of OER-integrated course materials.

### Identification of OER Materials to Be Integrated in the Course Materials

As noted above, the course blueprint is developed only once the course syllabus has been approved by the Malaysian Qualifications Agency (MQA). The blueprint is a comprehensive document outlining the course content, course learning outcomes, individual unit learning outcomes, and information on the formative and summative assessments, as well as providing a list of reference materials. Course Co-ordinators in WOU are tasked with sourcing and identifying the relevant OER materials for each of the units and topics in the course. To assist the Course Co-ordinator, a resource person from the Library and Learning Services Unit works closely with him or her in screening the digital resources.

Based on the standard operating procedures of WOU, this task involves two stages:

1. A number of reputable and peer-reviewed OER repositories are identified and shortlisted by the CDT.
2. Each repository is manually trawled using its native search mechanism to locate the relevant OER materials. These materials may be in the form of case studies, conceptual and research articles, book chapters, streamed video, podcasts, visuals and so on. The CDT assesses, in addition to the copyright licence of the materials, the quality, relevancy and currency of the content before they unanimously agree on the chosen OER materials to be adapted or used. This ensures effective integration of the OER materials selected in the development of the relevant course materials.

### Adaptation of the OER Material

Generally, all courses in WOU are made up of five units. As such, the OER materials that have been identified by the CDT for the entire five units need to be passed to the external writers. At the completion of each unit by the writer:

- The unit is sent to the instructional designer for pedagogical input that will transform the unit into self-directed learning materials.
- The input from the instructional designer is then given back to the writer for further comments that will result in a second draft.
- This draft undergoes the relevant quality assurance process to ensure and maintain the academic quality of the unit.

The above process is repeated for each unit of the course. Once the process is completed, the final draft of the course materials, consisting of the entire five units with the feedback and comments from the ECA, are vetted again by the Course Co-ordinator concerned. The Course Co-ordinators must present a course development report to the Senate for approval before the course can be offered to students in any particular semester.

The WOU's OER-based course materials are then shared through the WOU OER Repository managed by the Learning and Library Services Unit. This repository is an online collection of the university's OER, learning object metadata and other learning materials output. The WOU's materials are shared only in html, pdf and other available formats once approval of the Senate is received.

WOU adopts the Creative Commons Attribution-Noncommercial-ShareAlike licence (CC BY-NC-SA) as the University Open Licence for its OER-based course materials. The content is available for re-use, repurpose and redistribution provided it is used in a non-commercial way and is attributed to its creator. Any changes made by others to the content must be distributed using the same licence.

## **Cost Implications and Benefits of Using OER-Based Course Materials**

The MQA has stipulated that when the first batch of students belonging to a particular programme enters their second to last semester, the institution must apply for full accreditation status.

To date, WOU has received full accreditation from the Malaysian Qualifications Agency (MQA) for 28 of its suite of 46 ODL programmes. This achievement comes at a great cost, because for each programme a complete set of all the course materials in the programme must be readily available for each learner before the institution can apply for the full accreditation of its programme.

Developing course materials from scratch, as illustrated in Figure 9.1, takes the institution about 12–18 months. As WOU does not have the luxury of time and needs to produce the course materials in the minimum required time for a student to graduate based on the regulatory requirements, the university has adopted three models for accelerating the production of course materials:

- **Using pre-developed proprietary course materials under licence from more established ODL institutions (such as Open University of Hong Kong and SIM University Singapore)** – These acquired course materials from other institutions are adapted and the content localised, as appropriate.
- **Developing course materials using the “wrap-around textbook” model** – In this model, the course materials are developed with significant

reference to a particular established textbook that is provided alongside the course materials. This model compensates for the lack of specialist academic expertise and for the extensive time required to develop the course materials.

- **Developing course materials as stand-alone resources without making any reference to a particular textbook** – For certain courses, however, textbooks are still provided as supplementary reading materials.

The first two models have cost implications for the WOU: the university has to bear not only the cost of developing and printing the self-instructional course materials, but also the increasing cost of printed textbooks and the licensing fees remitted to the licensor of the proprietary course materials. However, during the early development days of WOU, this was a necessary trade-off to operationalise the university in a limited time frame.

After completing the first cycle of the course presentation, plus exploring to offer a new suite of programmes to cater to market needs, the university has re-examined the first two models to ensure financial sustainability. To be financially prudent, WOU has migrated away from proprietary course materials used under licence and moved from bundling the course materials around a particular textbook. Hence, for a more viable economic model and to achieve self-sustaining financial status, the WOU management has unanimously agreed to adopt the stand-alone model, by which the university would be able to meet the requirements of MQA.

Nevertheless, the stand-alone model presents a new challenge with respect to the development time required in preparing a complete set of course materials. As mentioned above, it would take about 12–18 months to complete a course development cycle. With this constraint, the university encounters difficulties in making available sufficient courses for students to register in each semester, and especially when many new programmes are being offered. This impedes the efforts of WOU to increase revenues. As reflected in Figure 9.1, for every single course to be developed over 12–18 months, a CDT is required.

Acknowledging all these constraints, WOU revisited the course development model as part of its continuous improvement plan and with an eye to reducing costs and increasing revenues.

It was from this perspective that OER initiatives were explored and gradually implemented in WOU. The availability of high-quality, peer-reviewed, ready-made content under a Creative Commons licence that permits the free and fair use/re-use of material will eliminate the need to develop some of the learning components from scratch. Apart from shortening the course development time, the CDT could also focus on developing more courses within the usual 12–18 months allocated for the development of a course. This will certainly improve the use of human and physical resources. This is a notion supported by Hylén (2006). The use of OER shortens the development time of course materials while maintaining high quality through the peer-reviewed nature of OER found in the various established repositories. Geser (2007) expressed the same sentiment, noting that the use of OER materials enables institutions to achieve significant reduction in material development costs.



## Conclusions

WOU, although being a relatively small institution compared with the other mega open universities in the Asia region, has pioneered and responded to the global advocacy for the OER movement. Under the stewardship of Tan Sri Prof Emeritus Gajaraj Dhanarajan, the first Vice-Chancellor of WOU, the institution has propelled many significant OER-related initiatives. Among these was the bringing together of policy-makers, scholars and practitioners to share experience, knowledge and practices in OER during the two OER Regional Symposiums held in WOU in 2012 and 2014. The university has also created an Asian forum, a Web portal (OERAsia<sup>1</sup>) that shares information and good practices on OER, and has launched a digital repository of OER.

In the spirit of lifelong learning and equitable access, OER are gradually transforming the global education landscape. Guided by the principle of making education more affordable and accessible to the masses in this time of inflation, WOU has embarked on integrating OER materials in the development of its course materials as a more cost-effective measure. The adoption and adaptation of OER materials has translated to significant savings in time and cost in the course material development cycle and in the time to deliver the course to the market. Reduction of time to market means faster revenue generation to the institution and optimisation of resource utilisation.

Rigorous and stringent quality assurance checks and monitoring will be upheld to maintain quality of OER to ensure their relevancy and suitability. WOU will continue with its efforts to develop new materials or revise its existing course materials to include OER materials as a more cost-effective measure.

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1 <http://www.oerasia.org/>

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## OERu: Realising Sustainable Education Futures

*Wayne Mackintosh*

### Abstract

This chapter describes a case study that details the incremental design and development of the OER universitas (OERu) consortium of post-secondary institutions collaborating on providing more affordable access to higher education using Open Educational Resources (OER) courses with pathways to achieving credible degrees. The case study describes how the OERu innovation partnership is using OER in a disaggregated service provision model to achieve a fiscally sustainable and scalable open education collaboration. The chapter concludes with key principles that underpin the successful progress of the OERu.

### The OERu Concept

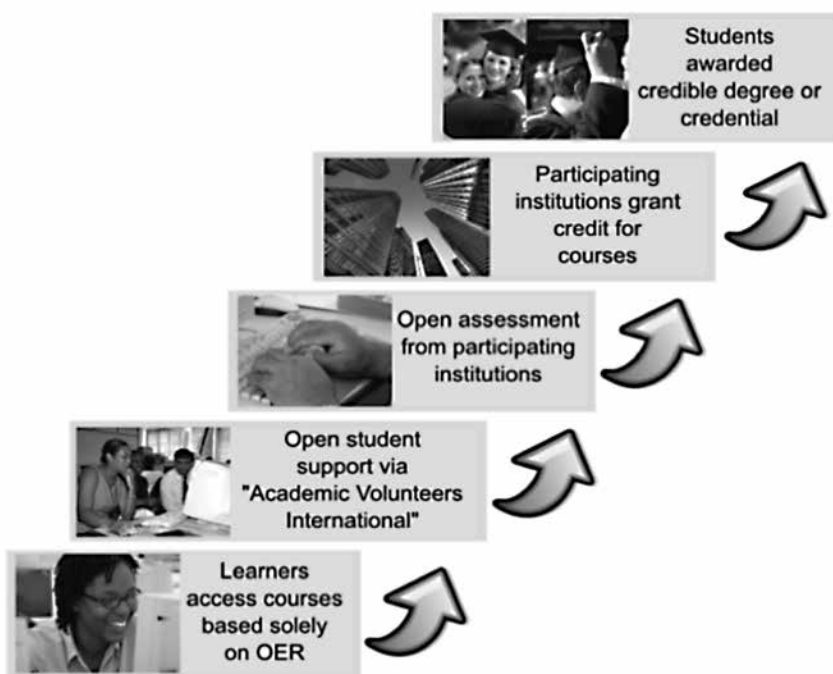
“The OERu envisions a world where all learners have affordable access to higher education.”

The OER universitas (OERu) is a consortium of 34 post-secondary institutions and organisations (as of February 2015) collaborating on the assembly of university-level courses from Open Educational Resources (OER) and providing pathways for learners to achieve formal academic credit towards credible credentials.

The OERu, founded in 2009, is an international innovation partnership with member institutions from Africa, Asia, Europe, the Middle-East, Oceania and North America. (See Appendix A for list of OERu partners.) Implementation of the OERu is co-ordinated by the Open Education Resource Foundation (OER Foundation), which is a New Zealand-based independent, not-for-profit limited company that provides leadership, international networking and support for educators and educational institutions to achieve their objectives through open education.

The core mission of a traditional university is to contribute to society as a community of scholars through the pursuit of education, learning and research. Most publicly funded universities incorporate the mission of community service to serve the wider interests of the communities in which they operate by sharing expertise and scholarship for the benefit of society.

Through the community service mission, it is possible for organisations to invest time and effort to assemble courses based solely on OER. As accredited institutions, these universities, colleges and polytechnics can provide summative assessment services with pathways for learners to earn formal academic credit and pay lesser fees for assessment and credit compared with full tuition. By combining the potential of OER with the community service mission, it is possible to create what Taylor (2007) has called a “parallel universe” of post-secondary learning opportunities to complement and augment formal education provision, especially for those who lack the means to follow traditional learning paths. Figure 10.1 illustrates the OER model, which is designed to provide more affordable access to higher education, leading to formal academic credit.



**Figure 10.1: The OERu model.**

In 2013, the OER “university” adopted the name “OER universitas” to better reflect the developing nature of the OERu network, with its increased membership from non-teaching institutions and a growing number of universities, community colleges and polytechnics (OERF, 2013b). The OERu has always used the lowercase “u” to refer to a community of scholars sharing information freely, rather than denoting the title of a formal teaching institution. The OERu draws on the original etymology of *universitas magistrorum et scholarium*, reflecting the spirit of the OERu as a global network of accredited post-secondary institutions and educational agencies co-operating on open education approaches.

The maturation of the OERu network has followed an evolutionary rather than revolutionary development process. The following section details the incremental development of the OERu international partnership.

## Summary of the Historical Development of the OERu

The design and implementation of the OERu is characterised by methodical and rigorous planning. A distinguishing feature of the OERu partnership is that all planning is conducted transparently in WikiEducator, and the network has adopted an incremental approach to remain agile and responsive to the dynamic changes in the evolving landscape of open online courses. Since the inception of the OERu, all partner meetings have been streamed live on the Internet, with opportunities for remote participants to engage and contribute to the university's planning.

The implementation of the OERu has been structured according to three distinct phases:

- **Prototyping (2012–2013):** At the first meeting of the founding OERu anchor partners, hosted at Otago Polytechnic in November 2011, the network agreed to develop three prototype courses to inform planning and decision-making in preparation for the launch meeting at Thompson Rivers University in October and November 2013.
- **Consolidation (2014–2017):** During this phase, the OERu partners are focusing on assembling courses for a coherent programme of study leading to a Bachelor of General Studies and a few additional programmes. At the same time, support processes and technology infrastructure will be developed to ensure successful implementation of the OERu.
- **Scalable implementation (2018–):** During this phase, the OERu aims to achieve a fiscally self-sustaining network without reliance on third-party donor funding to scale the OERu programme of study. A key focus is to nurture the development of ecosystems to support the mainstream integration of open education approaches at partner institutions.

### Prototyping Phase (2012–2013)

The concept of the OERu was first conceived in November 2010 during a serendipitous meeting between the author of this case study and Jim Taylor, Emeritus Professor at the University of Southern Queensland. Both were invited speakers at the 54th meeting of the Australasian Council on Open, Distance and e-Learning (ACODE), hosted by Massey University in New Zealand, and delivered presentations on, respectively, the integration of open education approaches and open scholarship in higher education. During the lunch break, the two informally discussed ideas relating to the OERu concept and agreed to convene an open meeting early in the next year to review the viability of this nascent OER collaboration. The oeruniversity.org domain name was registered on 8 December 2010 by the OER Foundation in preparation for the forthcoming open meeting.

- **Meeting for the “OER for Assessment and Credit for Students” project** – The OERu concept was introduced to the world during an asynchronous seminar and think-tank hosted by the SCoPE online

community of BCcampus during 4–21 February 2011, where the open communities were invited to advise on ideas and prospective models for the OERu (Stacey, 2011a). This online think-tank preceded the international open planning meeting for the “OER for Assessment and Credit for Students” project on 23 February 2011, hosted by Otago Polytechnic in Dunedin, New Zealand (OERF, 2011a).

The OERu was proposed as a means of providing more affordable access to post-secondary education for the estimated increase of more than 100 million learners in the world who will be qualified for a seat in tertiary education over the next decade — and who, because of funding issues or lack of tertiary education provision, will not be able to gain credible qualifications (Daniel, 1996).

The UNESCO Office for the Pacific States provided financial support to stream the meeting live on the Internet to allow participation by education leaders and interested persons from around the globe. In addition to the face-to-face participants representing institutions from Australia, Canada, Fiji, New Zealand and Samoa, the meeting attracted 202 registered virtual participants from 46 different countries. The meeting began work on proposals for action and discussed and proposed a high-level planning framework and corresponding logic model to guide the implementation of the OERu. Participants recommended two credentials starting with foundation courses leading to a Diploma of Arts and a Graduate Certificate in Tertiary Learning and Teaching.

At the time, there were only four contributing members of the OER Foundation: Athabasca University, BCcampus, Otago Polytechnic, and the University of Southern Queensland. The open meeting endorsed the OERu concept and the OER Foundation began work on developing an OERu planning page on WikiEducator. The first version on 4 March 2011 described the burgeoning network as follows (WikiEducator, 2011):

“The [OERu] is a virtual collaboration of like-minded institutions committed to creating flexible pathways for OER learners to gain formal academic credit. The [OERu] aims to provide free learning to all learners worldwide using OER with pathways to gain credible qualifications from recognised education institutions.”

In April 2011, the OERF published an information sheet, *5 Things You Should Know About the [OERu] Network Plan*, to support the recruitment of founding anchor partners. The philanthropic intention of the OERu to widening access to more affordable education was summarised as follows (OERF, 2011c):

“Existing delivery models cannot address the growing global demand for post-secondary education. Many countries do not have the resources to build the number of conventional universities that would be required to meet the future demand for tertiary education. The OERu is nurturing the development of a sustainable and scalable OER ecosystem for the formal sector. The [OERu] concept aims to create a parallel learning universe based

solely on OER for learners excluded from the system to augment and add value to the formal education sector.”

- **The 2011.11 Meeting of founding OERu anchor partners** – In November 2011, the OER Foundation convened a meeting of founding OERu anchor partners at Otago Polytechnic in New Zealand. By this time the network had grown to 13 contributing partners. The meeting of anchor partners was preceded by a consultative online SCoPE seminar hosted by BCcampus on designing OERu credentials. The summary of recommendations from the open community was tabled as input for consideration by the OERu partner institutions (Stacey, 2011b).

The meeting participants worked on proposals for action to advance the five key decisions made at the 2011 meeting (OERF, 2011b):

1. *Adopt a Bachelor of General Studies as the inaugural credential for the OERu.* This credential was selected because a number of partners offer the qualification. The Bachelor of General Studies also provides considerable flexibility for nominating courses for inclusion in the OERu programme of study.
2. *Complete the development of three or more OERu prototype courses.* The prototyping approach implements the network’s preference for incremental design to inform decisions on OERu processes and technology infrastructure within authentic delivery contexts.
3. *Develop a framework proposal for “Academic Volunteers International.”* The purpose of this activity was to advance the design of a sustainable system of volunteer support for OERu learners by building use case scenarios illustrating how OERu learners might use Academic Volunteers International and what services could be provided.
4. *Request guidance and support from the Commonwealth of Learning for adopting and modifying the Transnational Qualifications Framework (TQF).* The TQF was originally developed by the Commonwealth of Learning (2010) for the Virtual University for Small States of the Commonwealth. Quality assurance and credible credentials are important foundations of the OERu model, and the TQF provides a reasonable framework for the OERu to advance solutions for the virtual mobility of learners across national boundaries.

To evaluate the OERu project, the Context, Input, Process and Product Evaluation (CIPP) model (Stufflebeam, 2007) was adopted for guiding the design and implementation of the initiative.

- **2013 Meetings of OERu anchor partners** – Following the inaugural meeting of founding anchor partners, the network proceeded with identifying and selecting prototype courses for development. The network managed to complete the design and development of four prototype courses:
  - *Regional Relations in Asia and the Pacific*, a first-year course developed by the University of Southern Queensland and focusing on international relations – A distinct feature of this course was the incorporation of a “pedagogy of discovery” where learners could source and study OER and

open access materials in pursuit of their own learning interests. The course was structured using comprehensive eLearning activities and assessments mapped to the learning outcomes of the official university course.

- *Art Appreciation and Techniques*, assembled by Thompson Rivers University – This course was revised and remixed from a course originally developed by the Open Course Library Project (Washington State Board for Community and Technical Colleges: Online) and later adapted by the Saylor Foundation. This prototype demonstrated the power of remix by adding value through the experience of design for open and distance learning (ODL).
- *Open Content Licensing for Educators*, a micro Open Online Course designed to build the capability of educators in understanding copyright, OER and open licensing – A key component of this prototype was the development of a course feed aggregator to enable learners to participate using their own personal learning environments.
- *Scenario Planning for Educators*, a MOOC presented for OERu learners participating for free, in parallel with students registered for a postgraduate qualification at the University of Canterbury – This prototype demonstrated the technological ability to integrate the delivery of an open course using a personal learning environment for free learners together with the local learning management system (LMS) at a traditional university. Initial data suggests that offering open courses using this “parallel mode” does not result in the levels of attrition experienced by the commercial xMOOC courses (OERF, 2013a).

The experience derived from these courses provided valuable insights into directing the conversations and decisions of the 2013.10 Meeting of OERu anchor partners hosted by Thompson Rivers University (OERF, 2013c).

The key decisions arising from this meeting underscored the need for the collaborative and consultative development of a strategic plan for the OERu and the establishment of a working group structure to oversee the operational priorities of the collaboration (OERF, 2013c). The inaugural meeting of the OERu Council of Chief Executive Officers, hosted at Kwantlen Polytechnic University, also endorsed the need and priority for developing a strategic plan for the OERu (OERF, 2013d).

- **Official launch of the OERu** – The launch event of the OERu coincided with the second meeting of anchor partners hosted by Thompson Rivers University (OERF, 2013c).

Sir John Daniel, former President and Chief Executive Officer of the Commonwealth of Learning and former Vice-Chancellor of the Open University, officiated at the launch of the OERu as the guest of honour. During the event, he announced: “[To] know is better than not to know ... I wish you well in this exciting endeavour and now I will press a button to announce to the world that the open education movement has taken another great step forward” (OERF, 2013c).



## 2014 Meetings of OERu Anchor Partners

Implementing the recommendations from the 2013 meeting of OERu partners, the network established eight working groups, each focused on a different priority area to advance the 2014 operational activities. The convenors of each working group served on the newly established OERu Management Committee tasked to provide managerial and operational oversight over the implementation of the activities of the OERu working groups. The OERu Management Committee convened about every three months, and meetings were broadcast live on Google Hangouts on Air. Individual working groups made up of members from OERu partner institutions organised their own meetings and kept public records by posting minutes of their meetings in WikiEducator.

The Strategic Planning working group was tasked with the consultative development of the OERu strategic plan. Drawing on the results from the 2013 partners meeting, a draft plan was posted in WikiEducator in May 2014. An extensive period of open consultation followed. An open online seminar hosted by BCcampus was convened to synthesise the discussion inputs before the draft strategic plan tabled was written and approval at the 2014 partner's meeting.

The OERu has implemented an “evergreen” strategic plan: a “live” public document in WikiEducator that can be refined as new information about changes in the internal and external environment comes to light (OERF, 2014a). Evergreen planning affords the OERu the opportunity to respond with agility to new strategic opportunities and allows for nimble responses where corrections in strategy need to be made.

The OERu achieved its first successful course completion by a learner in 2014. Michele Aragon, a student from Thompson Rivers University, participated in the prototype offering of the “Regional Relations in Asia and the Pacific” course developed by the University of Southern Queensland. Aragon was assessed by the University of Southern Queensland and applied the credit for this course towards her credential from Thompson Rivers University. This is an important milestone for the OERu, demonstrating that the model works.

The 2014 meeting directed attention to approving the OERu Strategic Plan 2015–2017 and developing corresponding proposals for action for the implementation of the plan (OERF, 2014b). Participants reviewed the guidelines for OERu credit transfer and course articulation. Important decisions arising from this meeting included:

1. *Implementing annual OERu Institutional Action Plans as a requirement of OERu membership* – Partners indicate how they plan to allocate their agreed 0.2 full-time-equivalent staff contribution to the network, linked to the annual key performance indicators and operational priorities of the OERu Strategic Plan.
2. *Advancing technology strategies for the development of the OERu community source concept* – Partner institutions collaborate on technology innovation and integration with local systems. The OERu also agreed to explore the use of complementary open source delivery platforms, including WordPress and Open edX.
3. *Advancing the development of a coherent programme of study for OERu learners.*

The second meeting of the OERu Council of Chief Executive Officers approved the OERu Strategic Plan 2015–2017 and endorsed the implementation of annual Institutional Action Plans (OERF, 2014c). Participants at this meeting endorsed the importance of recognising as authentic institutional activities those contributions made by staff to the OERu. It was also agreed that the OERu would investigate the implementation of matched-funding projects between the OERF and OERu partner institutions.

The OERu collaboration established solid bases during its prototyping phase (2012 and 2013), enabling it to start work in 2014 on the consolidation phase of the implementation of the OERu innovation partnership.

## **The OERu “Business” Model**

The OERu is a philanthropic collaboration and not a business in the commercial sense of the word. The concept of “business model” in the context of this case study does not refer to making a profit but to: promoting efficient practices that minimise cost; ensuring appropriate revenue streams to sustain operations; and widening opportunities for the social good of formal education.

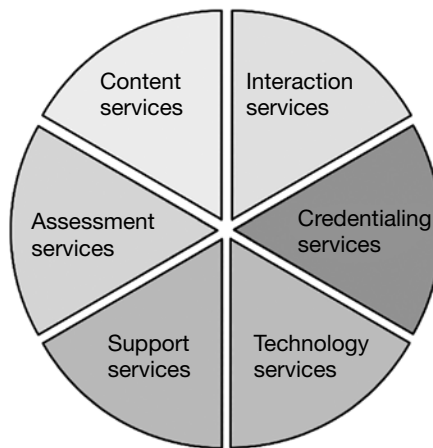
In this section, the case study explains how the OERu collaboration and corresponding organisational structures are leveraging OER to unbundle traditional services in a sustainable way. The section concludes with a succinct report on the financial performance of the OER Foundation in moving towards becoming a fiscally self-sustaining model for open education.

## **The Conventional Aggregated University Package**

Anderson and McGreal (2012) have suggested that “disaggregation may prove to be a cost-effective way to reduce tuition payments, while maintaining quality” in higher education, drawing on a comparison of discount service models available to consumers in many industries.

The unbundling of the services and processes of learning, assessment and accreditation provides a model for the design of a fiscally sustainable OER collaboration, one that can offer learners free access to online courses. The courses provide pathways for learners to acquire formal academic credit at significantly reduced cost compared with the traditional full-tuition model associated with a standard university package.

The conventional model for the provision of post-secondary educational services in general, and especially those provided by single-mode distance education institutions, “consists of a complicated set of service provision, with many complementary and sometimes integrated services” (Anderson & McGreal, 2012). These services are usually combined as a total package offered by the teaching institution for a standard full-tuition fee. The services of a university package can be classified under the groupings illustrated in Figure 10.2.



**Figure 10.2: Post-secondary educational services provided in a conventional university package.**

The nature of these services is summarised below:

- *Content services* include face-to-face lectures, online learning materials, printed study guides produced by the institution, and third-party copyright materials used under licence for the payment of a fee.
- *Interaction services* involve the three forms of interaction (Moore, 1989) incorporated by teaching institutions into the package:
  - *student-teacher interactions* (e.g., answers provided during lectures, discussion forum posts or lecturer feedback provided on assignments)
  - *student-content interactions* (e.g., planned interventions whereby learners receive formative feedback on interactive objective items or interact with laboratory experiments)
  - *learner-learner interactions* (e.g., planned face-to-face small-group activities or integration of peer-to-peer online activities)
- *Assessment services* include both formative assessment interventions (including feedback to support the learning process) and summative assessments, challenge examinations and recognition of prior learning that may lead to credentialing.
- *Credentialing services* mean the range of activities that support the credentialing processes at accredited institutions (e.g., the administration of transcripts, articulation agreements, credit-transfer processes among institutions and awarding of credentials).
- *Support services* include pastoral learning support, career guidance and counselling, library services, and academic study skills.
- *Technology services* mean the technology infrastructure and support for blended and technology-enabled learning, including online course delivery.

Students who register at traditional universities normally establish a contractual relationship with the accredited education institution to provide all of the listed services as a “full-tuition” bundle. In the public education sector, the costs of providing these services are funded through government grants or subsidies; and, in many countries, students contribute to these costs through student

tuition fees and may receive government support through student loan schemes. The accreditation status of the teaching institution is an important criterion for learners to qualify for state-aided student loan schemes. It is also often a requirement for receiving government grant support. Consequently, funding models and the corresponding flow of funds are significant factors to consider for the design of the OERu business model.

### **Cost Considerations for Using OER to Disaggregate Services for Sustainable Business Models**

From the perspective of individual OERu partners, the collection of services generates costs that can be divided into *capital costs* (fixed costs) and recurring *operational costs* (variable costs). Capital costs, like the investment in course development, can extend over a number of years. They tend to be fixed in that they are not affected by fluctuations in the number of course registrations. Operational costs, like tutorial and assessment services, are variable in relation to the number of students taking courses each year. The distinction between fixed costs and variable costs is significant when designing cost-effective systems that can be increased or decreased as needed.

On the cost side of the equation, an important consideration when designing business models for sustainable OER implementation is the concept of *sunk cost* (meaning a cost that has already been incurred and cannot be recovered). For example, when an institution has already incurred fixed costs to develop materials for a course, this cost cannot be reversed because it has already been spent. Sunk costs cannot be altered by later decisions and “are irrelevant in decision-making” for future investments (Crowningshield & Gorman, 1979). Consequently, the decision to openly license existing course materials will not alter future costs associated with these course materials because they are sunk costs (assuming the course is not encumbered by third-party copyright resources).

Moreover, the marginal cost of replicating digital knowledge is near zero. And, from the perspective of the user, OER are a non-rivalrous good because “additional users in no way decrease the benefit derived from the good by the original consumers” (Casella & Frey, 1992). In publicly funded institutions that receive government grants to help cover the salary costs of the educators involved in course development, it is unreasonable to expect taxpayers to pay twice for their education materials.

Notwithstanding the potential for a significant cost reduction by using courses based solely on OER, a research survey of higher education institutions in the United Kingdom — focusing on assessment and accreditation in collaboration with the OERu partnership — found that institutional leaders were reluctant to provide full accreditation services based on OER courses. Many said they preferred alternative forms of certification (e.g., “soft-badging”) as a “lower risk” solution (Witthaus, 2012). This suggests that higher education institutions are concerned about losing market share by giving away course materials that can be expensive to produce.

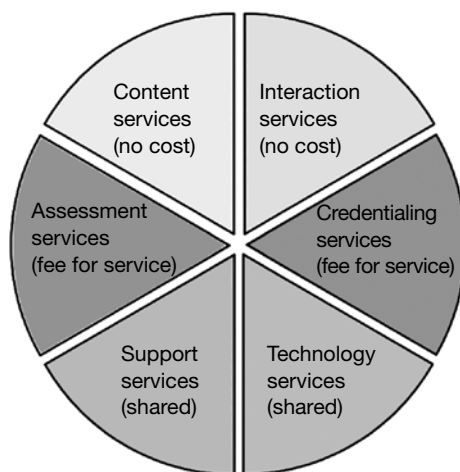
On the income side of the equation, a key question is the issue of “cannibalisation” — that is, whether the introduction of a new product by the same producer will reduce market share of a previous product. Education leaders

are concerned that the introduction of OER courses with a parallel free online version may reduce student enrolment. In the case of the OERu, we do not believe that this is a material risk because the OERu aims to serve new markets that partner institutions are not currently serving well. It is unlikely that the target audience would be able to afford the traditional full-tuition services offered by partner institutions.

The OERu collaboration was the first international network to implement accreditation solutions for no-cost online learning courses. The network provides an international example of how the unbundling of traditional services can facilitate the provision of more affordable learning opportunities using courses based solely on OER, with pathways for learners to earn credible credentials from accredited higher education institutions (McGreal, Mackintosh, & Taylor, 2013).

Important to note is that OERu courses are designed for independent self-study and OERu partners do not incur costs for providing tutorial support services.

As Figure 10.3 shows, the OERu network provides content services for free to learners (using OER-based courses). Interaction services can also be provided to learners at no cost. Those services rely on pedagogical designs that embed peer-to-peer learning support using social media technologies and they foster the development of an open community of academic volunteers.



**Figure 10.3: Educational content services at the OERu.**

The OERu network is reducing the cost of support services and technology services by using shared infrastructure based entirely on open source software provided by the OER Foundation, a non-profit organisation. These services are funded by membership fees paid by the OERu anchor partners participating in the network. This unbundling of services enables the OERu anchor partners to provide the assessment and credentialing services on a fee-for-service basis, at significantly reduced cost compared with full-tuition services at a university. This is a low-risk innovation because recovery of the recurrent costs associated with assessment and credentialing is guaranteed.

The OERu has adopted the use of “free cultural works approved licences” as a principle of engagement. Free cultural works approved licensing requires that courses be assembled and licensed under a Creative Commons Attribution (CC BY)

or Creative Commons Attribution-ShareAlike (CC BY-SA) licence or otherwise dedicated to the public domain. The OERu does not license courses using the NonCommercial or NoDerivs (no derivatives) restrictions that would curtail uses which could contribute to nurturing the development of sustainable distribution ecosystems. For example, an African entrepreneur may repackaging digital courses in print format for wider distribution to rural areas and to also contribute to local income generation. This practice would not necessarily be permissible with resources using the non-commercial restriction.

The OERu example of disaggregation uses OER to replace the fixed-cost components of the package, and creates a scalable and sustainable mechanism for cost-recovery of the recurrent variable costs. In this way, the unbundling can achieve significant cost reductions while widening access to educational provision.

In short, the OERu model is a no-frills, assessment-only model that is offered in parallel with the traditional full-tuition alternative at accredited institutions. By disaggregating services using OER courses, this model can provide more affordable access to higher education, especially for learners currently excluded from the formal education sector because of financial reasons or lack of in-country provision. The potential savings in tuition costs by unbundling services for learners are significant.

Consider, for example, that the average tuition fees for a four-year degree in the United States from a public research university in about 2009/2010 were USD 30,252 (Delta Cost Project, 2010). Based on the pricing levels of the first OERu pilot course developed by the University of Southern Queensland, the equivalent fees for a four-year degree using the disaggregated model would have been about USD 6,759 — less than a quarter of the fees for the degree offered by a U.S. public university (OERF, 2012).

Jan Thomas, Vice-Chancellor of the University of Southern Queensland, points out that the OERu model opens education by giving many more people “the ability to access university level courses” and by removing cost “as a barrier to learning” (OERF, 2012).

## **Fiscal Performance of the OER Foundation and the OERu Initiative**

The fiscal performance of the OER Foundation suggests that the network is well on track to achieving a self-sustaining OER initiative.

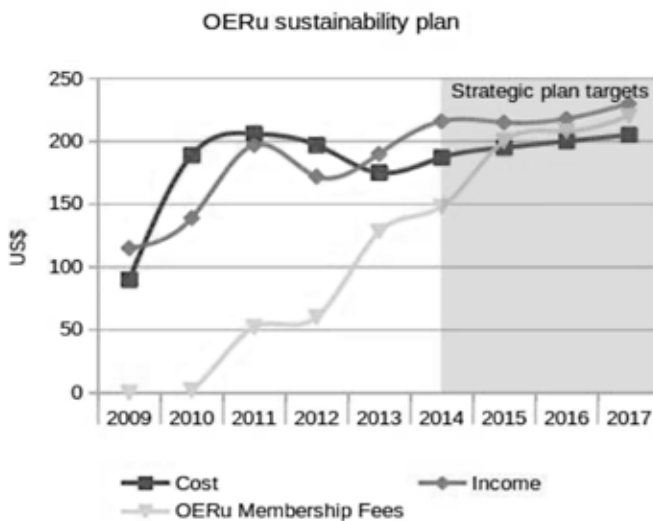
The OERu Strategic Plan 2015–2017 qualifies the objective of attaining a fiscally sustainable and scalable network as follows (OERF, 2014a):

“The OERu network is fiscally sustainable and scalable when:

- The membership fees from contributing partners cover the central infrastructure costs for hosting free content and related technology support services without reliance on 3rd party donor funding;
- OERu partners assemble courses using open textbooks, OER and open access materials thereby reducing costs for full-fee students on campus and opening parallel pathways for assessment-only services for OERu learners;

- OERu partners recoup recurrent cost for assessment-only services, generate new revenue for value added services and deploy OERu courses for local delivery at near-zero cost;
- The OERu network diversifies revenue sources to support strategic projects for the benefit of its partners; and
- The network achieves a critical mass of active engagement from staff at OERu partners through, for example: contributing to the planning and implementation of the OERu by establishing a small community source model for technology innovation, and progressing the implementation of Academic Volunteers International.”

The OERu has built a solid financial basis from which to achieve a fiscally sustainable collaboration. As Figure 10.4 shows, at the end of fiscal 2014/2015, about 72% of the operational costs of the OERu collaboration were being recovered through membership fees. During the inception years of the OERu initiative, the generous funding support from the William and Flora Hewlett Foundation enabled the OER Foundation to achieve the critical mass of OERu partners for a viable international partnership. During that period, the OER Foundation also received nominal financial support from the Commonwealth of Learning equal to about 7.5% of the annual operational cost of the OERu project in fiscal 2014/2015.



**Figure 10.4: Financial performance of OERu, 2009/2010–2016/2017.**

The OER Foundation pursued additional project and contract work to reduce the cumulative deficit during its formative years. However, this contract work contributed to mission drift by using scarce resources for projects not directly related to the implementation of the OERu. The OER Foundation has succeeded in reducing the accumulated deficit for its first four and a half years of operation to a nominal amount under \$5,000. This means that the OER Foundation has started its 2015–2017 Strategic Plan without the burden of debt, unlike several commercial MOOC start-ups, which will need to recoup multi-million dollar investments from venture capital funding.

As an independent non-profit organisation, the OER Foundation must reinvest any surpluses back into charitable activities for the benefit of the OERu network. While the generation of surpluses is not a major focus for the consolidation phase of the OERu plan, should the recruitment of new members exceed anticipated targets, these funds could be reinvested in, for example, commissioning the assembly of OERu courses or contributing to additional support for the OERu infrastructure to scale the project.

## Key Principles Underlying the Success of the OERu Model

In summary, the success of the OERu collaboration to date has been supported by the following guiding principles:

- **Responding to a compelling vision that is well aligned with the core values of the contributing institutions** – The vision of providing free learning opportunities for all students worldwide with pathways to achieving affordable degrees, especially for learners who are excluded from the privilege of a tertiary education, is a compelling and worthy vision. This is well aligned with the community service missions of the contributing partner institutions.
- **Open sourcing everything** – The OERu is distinctively open by using OER, Open Education Practices (OEP), open licensing, open source software and open planning processes. Apart from significant cost savings in providing central technology infrastructure using open source software, open and transparent planning builds trust for existing and prospective partner institutions. All partners can see and participate in all aspects of the implementation of the OERu without excluding valuable contributions from individuals in the open community.
- **Respecting the decision-making autonomy of partner institutions** – A key principle of engagement in the OERu model is the institutional autonomy of partner institutions regarding all decisions relating to the assessment and accreditation of learning. In this way, partner institutions will not jeopardise their institutional stature, brand or credentialing authority, yet the network, working collectively, is able to achieve more than working alone.
- **Generating a viable value proposition for partner institutions** – Without tangible benefits for contributing partners, there is no motivation for institutions to contribute. The OERu enables institutions to participate in an international network while responding to their community service mission. The OERu model enables partner institutions to build capability in open and collaborative design models for open online courses while generating opportunities for reducing cost. For example, partner institutions can diversify curriculum offerings for traditionally low-enrolment courses, expensive to produce alone, by integrating an OERu course into the curriculum for full-fee students without incurring any capital course development costs.



- **Avoiding the temptation to innovate on too many fronts simultaneously** – While the allure of innovating through technology is appealing, there is a risk of exceeding the capacity of the economy and society to accept the new developments. Society and the higher education sector are traditionally conservative when it comes to the value of a university degree. The OERu has restricted its primary innovation to using courses based on OER for formal academic credit and has intentionally left the innovation (e.g., of new forms of credentialing, such as open badges) to other players.
- **Minimising risk while maximising impact** – The OERu network model ensures low-risk exposure for partner institutions, limiting institutional exposure to the assembly of only two courses from existing OER. However, the collective network returns are significantly greater than the initial investment of individual partners, because the open model enables re-use and remix.
- **Guaranteeing recoupment of future operational costs of contributing partners** – The recurrent costs of providing assessment services in the OERu model are recouped on a fee-for-service basis, thus minimising risk for contributing partners. The open business model being adopted by the OERu also generates opportunities for new revenue streams from disaggregated services.
- **Adopting an incremental design model combined with rigorous strategic planning** – It is not possible to develop a detailed master plan for the medium term in a highly volatile and fast-moving technology environment in higher education. Moreover, the complexities associated with the dynamics of an international network made up of institutions from six major regions of the world could not reasonably be anticipated within a medium-term master plan. The OERu focuses on incremental projects that are small enough to fail but sufficiently strategic to facilitate organisational learning for the network. In this way, the OERu remains agile and responsive to changing needs.
- **Designing for sustainability from inception using a low-cost base** – The OER Foundation has succeeded in keeping its cost base, on average, below USD 200,000 per annum with only two full-time staff. Scalability for course development is supported through 0.2 full-time-equivalent staff contributions from participating OERu partners and so does not increase direct operational costs of the core network services.

Clearly, these principles are not mutually exclusive; they interact with each other in a dynamic ecosystem. The OERu model is sufficiently agile and flexible to enable individual partners to pursue their own priorities without compromising the collective goal of widening access to more affordable education.

Building on these guiding principles, the OERu is slowly succeeding in crossing the chasm from “How do you achieve sustainable OER projects?” to “How will institutions remain sustainable without OER?”

## Acknowledgements

The section on the conventional aggregated university package has been adapted and modified from the following publication, under a Creative Commons Attribution-ShareAlike licence:

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## **Appendix 10-A: OERu International Partners (June 2015)**

### **Africa**

National Open University of Nigeria (Nigeria)  
North-West University (South Africa)  
University of South Africa (South Africa)

### **Asia**

S.N.D.T Women's University (India)

### **Europe**

Institute of Technology Sligo (Ireland)  
Moscow State University of Economics, Statistics and Informatics  
(Russian Federation)  
Open University of Catalonia (Spain)  
The Open University (United Kingdom)  
University of the Highlands and Islands (United Kingdom)  
University of South Wales (United Kingdom)

### **Middle East**

Hamdan Bin Mohammed Smart University (United Arab Emirates)

### **North America**

Athabasca University (Canada)  
BCcampus (Non-teaching partner – Canada)  
Contact North/Contact Nord (Non-teaching partner – Canada)  
eCampusAlberta (Non-teaching partner – Canada)  
Excelsior College (USA)  
Kwantlen Polytechnic University (Canada)  
Portage College (Canada)  
Southern New Hampshire University (USA)  
Thomas Edison State College (USA)  
Thompson Rivers University (Canada)

### **Oceania**

Ako Aotearoa (Non-teaching partner – New Zealand)  
Charles Sturt University (Australia)  
Curtin University (Australia)  
NorthTec (New Zealand)  
OER Foundation (Non teaching partner – New Zealand)  
Otago Polytechnic (New Zealand)  
Unitec Institute of Technology (New Zealand)  
University of Canberra (Australia)  
University of the South Pacific  
(Regional University – 12 Pacific Island States)  
University of Southern Queensland (Australia)  
University of Tasmania (Australia)  
University of Wollongong (Australia)  
Waikato Institute of Technology (New Zealand)

# Integrating ICT for Innovative Educational Solutions in Oman: Leveraging OER Policy to Enhance Teaching and Learning

*Maimoona Al Abri and Saif Hamed Hilal Al Busaidi*

## Abstract

Oman's biggest developmental challenge is its reliance on oil revenue. In order to achieve sustainable development, the Omani government has focused on diversifying the economy and supporting industrialisation and privatisation, which require a strong labour force with 21st-century skills. In choosing practical approaches to education and human resources for sustainable development, the Omani government has decided to leverage the capabilities and affordances of information and communication technology (ICT) to help improve technology literacy and bring innovative practices in teaching and learning. Among all the ICT in education initiatives, the Open Educational Resources (OER) policy was developed in 2013 with a vision "to achieve high quality learning for all Omani citizens and to build a dynamic and sustainable knowledge society."

The policy aims to tackle the following national educational challenges: a) improving the quality of student learning outcomes; b) developing the level of teacher performance in teaching and learning; c) raising community culture towards ICT in education approaches; d) connecting education to accommodate the demands from the labour market; and e) supporting research and educational studies. Implementation of the OER policy is expected to promote autonomy of teaching practices and teachers, to enrich Arabic digital sources, and support knowledge creation. These will be integrated with eLearning, a student-centred learning approach, and expansion of digital schools.

## Introduction

The population of Oman is about 4.16 million. Young people constitute a high proportion of the total population. This demographic pattern is likely to change in the future due to the low birth rate, which points to an urgent need for

empowering the current generation of the labour force and students. Oman's natural resources are not as abundant and rich as those of its neighbouring nations, yet Omani economy has relied almost entirely on oil revenues. Realising the economic unsustainability of this situation, the government has focused a development plan on diversifying the economy and supporting industrialisation and privatisation. As part of this shift, human resource development has been set as a high priority on the government's agenda.

As education is the fundamental sector for producing effective human resources, it is expected to train citizens to keep pace with rapid technology developments as well as to strengthen their competitiveness at the international level. Strategically, the Ministry of Education developed both short-term and long-term ICT plans to support eLearning through which e-content is developed. The most important use of e-content is enriching national curricula for all teaching and learning purposes. To ensure the overall operation of ICT in education initiatives, including implementation of the Open Educational Resources (OER) policy, the Omani government emphasised collaboration at both the national level (with the Ministry of Education and the Information Technology Authority) and the international level (with UNESCO).

The OER policy in Oman is fairly new as it was only developed in 2013 under the guidance of UNESCO. The following five objectives are expected to be achieved by 2016:

1. Adopt open licences for curricula and textbooks.
2. Develop resources and tools and adopt open licence for the teachers.
3. Develop learning resources and adopt open licence for the students.
4. Make open-licensed professional development resources available through the Oman Educational Portal.
5. Make digital schools' ICT devices and Internet connection accessible for OER practices.

Monitoring and evaluation will be implemented to track the progress for future reporting.

This chapter provides an overview of Oman's ICT movement since 2009 and discusses the development of the OER policy in terms of what has been accomplished and what is to be solved in the future.

## **The Policy, ICT and Societal Context**

### **Education Context in Oman**

In 1998, the Oman government implemented a new educational model that includes 10 years of Basic Education and two years of Post-Basic Education (replacing the previous general education system of six years of primary school, three years of preparatory school, and three years of secondary school).

The extension Basic Education system has been purposely implemented to develop students' skills, attitudes, values and knowledge, providing them with the skills

needed for the development of lifelong learning. The system provides students with various forms of teaching and learning opportunities, including blended learning, group and individual class work, and field (out-of-classroom) activities. Throughout the process, students are expected to obtain skills such as self-learning, team work, communication, critical thinking, problem solving, research and discovery, and creativity to expand their capacity to deal with the surrounding world and with contemporary technologies.

Building on the solid educational foundation established through Basic Education, Post-Basic Education aims at (1) developing students with required basic knowledge to join the labour market, and (2) preparing students for academic and vocational education so that further contributions can be made towards social development. Students are expected to be capable of deploying acquired learning and training into practical life.

### **ICT for Educational Development**

One of the most important goals of development in Oman is to prepare Omani citizens with 21st-century skills. The government seeks to approach this through technology. ICT is essential in establishing an appropriate environment for the development of a cohesive society in Oman, which needs to be capable of confronting economic, social and cultural changes at the global level. With the understanding that ICT would help with evaluation and development of national services and strategies, the Omani government established the Information Technology Authority in 2006 with a clear vision of “moving towards a sustainable knowledge-based society.” All other government authorities have developed their strategies to align with the Information Technology Authority.

The Ministry of Education enthusiastically adopted the technological approach by implementing an ICT plan in the education sector in 2009. The ICT for education vision in Oman is to “harness ICT in education and build a long-term strategy to support E-education through which E-content is developed.” E-education under the Omani definition means enriching the national curricula, developing human resources in ICT in education, preparing e-schools to deploy technology in teaching and learning, supporting technological infrastructure and services, and developing the Educational Portal of the Ministry of Education.

It is clear that all of the above tasks under e-education require intensive inputs from education providers and little from students. Thus, Omani ICT in education policies emphasised all parties that belong to the category of education providers.

Key national actions that have taken place over the past six years include:

- Education Law: Enforcing the integration of ICT into teaching and learning.
- Curriculum Standards: Identifying ICT as having an essential role in redesigning curriculums.
- Teacher’s Competencies Project: Promoting ICT competencies that teachers should learn.

The Ministry of Education in Oman has envisioned ICT being part of a national strategy that conforms to international criteria. This represents the government’s belief in the importance and influence of technology tools and approaches, and in the need to provide leaders with a clear implementation pathway. In collaboration

with UNESCO, Oman participated in various expert and specialist meetings, including:

- the ICT Professional Development Framework for Teachers meeting organised by UNESCO, in Paris in February 2013;
- an expert meeting to set a timeline for the execution of the ICT Professional Development Plans, in Paris in March 2013;
- a workshop on conceptualising the National ICT Professional Development Strategy for Teachers, in Muscat in September 2013; and
- a workshop on Harnessing OER to deploy ICT in education, in Muscat in November 2013.

During these meetings, a National ICT Professional Development Strategy for Teachers in Oman was proposed. This strategy aims at:

- taking advantage of the power, diversity and connectivity of ICT to develop a creative and innovative society that contributes to national growth and development in the long run;
- creating learning and development opportunities for all members of the community; and
- developing managerial and technical competencies and services in the educational system.

The objectives of this three-year strategy are:

- Deploying a cohesive, coherent and orderly framework for teachers' ICT competencies in Oman to provide clear teaching methods by building knowledge up to the level of the UNESCO ICT Competency Framework for Teachers (ICT-CFT) (UNESCO, 2011).
- Designing and implementing all necessary courses and units using high-quality educational materials to provide learning paths for teachers and other educational administrators in Oman.
- Providing opportunities for primary and continuous professional development to promote the integration of ICT in Oman.

Although the ICT in Education Policy is to serve students in terms of teaching and learning, the Omani government has decided to approach the policy from the teaching aspect — not targeting students directly. Therefore, to ensure that ICT will be used effectively within every aspect of the teaching portal, the implementation of the strategy targets teachers, supervisors, school administrators (schools principals, deputies and school resource centre specialists), curriculum and evaluation officers, education and e-content specialists, and technicians.

As a result, the design of the National ICT Professional Development Strategy for Teachers is based on the following principles and concepts:

- It is expected that the design and selection of professional development courses are based on quality content and incorporate a variety of educational activities (direct learning, classroom activities and use of eLearning).



- The strategy focuses on the integration of UNESCO ICT-CFT in curricula for all courses.
- The Ministry of Education seeks to offer related in-service courses to teachers and administrators.
- Clear learning paths for teachers in Oman will be established to enable teachers to move gradually from technological illiteracy to deep knowledge through pre-service and in-service training and professional development.
- Courses produced through the strategy will adapt existing national and international courses to the local context, if possible.
- The strategy facilitates sharing of all related courses and educational materials by publishing them as OER under a Creative Commons licence.

With regard to the future application of ICT in schools in Oman, the following groups have been assigned with particular responsibilities:

- School principals and administrators: Responsible for developing plans for the integration of ICT as a key component of school plans.
- Teacher Academy: Responsible for reviewing and developing training courses to enable the implementation of wide professional development programmes related to the use of ICT in education for teachers.
- ICT specialists: Responsible for working within budgets to effectively integrate ICT on the frontline in Oman.

## The Development of OER Policy

The overall goal of the national OER policy of Oman is to be a catalyst to teachers' innovative use of OER and to empower learners with more culturally and linguistically relevant materials and learning opportunities. The aim is to contribute to the development of human resources with 21st-century skills for global citizenship. This is in line with the 2012 Paris Declaration on OER and the newer Qingdao Declaration released in May 2015.

### OER Readiness from Previous ICT Initiatives

Before the 2012 Paris Declaration on OER, educational resources in Oman were fully controlled by the Ministry of Education. All textbooks were published through the Curriculum General Directorate and Textbook Centre within the ministry. The Omani government, without foreseeing the future trend towards OER, started developing digital resources in 2008 and had been putting them online for use without any official licence. These initiatives were conducted through collaborations between and among Sultan Qaboos University, the Information Technology Authority, and the Ministry of Education. Examples of these initiatives are summarised below:

- **Community cognitive centres** – These centres serve the IT training project, which aims to provide opportunities for citizens to participate actively in the construction of a digital knowledge-based society. The centres are used to train, refresh and refine the skills of community members in the various regions in the Sultanate. Teachers are trained in these courses on

ICT skills, which prepare them for both the ICT and OER initiatives later on. Training deals with basic computer skills.

- **Interactive electronic content and educational films** – Educational and interactive activities and educational films are produced by the Directorate General of Curriculum Development and the Department of Content and E-learning to provide information and knowledge to students. These help teachers form an interactive environment and enrich the scientific temper for students in an interesting way. Interactive classroom activities are produced by the educational districts and in a decentralised way by schools. The total number of e-content products developed is about 500, ranging from educational aids and educational films to interactive activities for various subjects and different grades.
- **E-Courses at the Educational Forum** – E-courses provided at the E-Education and Content Forum (a Department of Training Courses) are prepared by teachers who excel in IT. Courses are introduced in an interesting way to maximise educational use and benefit for teachers and students in the forum. These courses will be shared via the OER platform to further utilise and deploy them.
- **Developing the “Learning Resource Centres Guide”** – Under this project, the *Learning Resource Centres Guide* was prepared, aimed at effectively activating these learning resource centres in schools.

The infrastructure and skills developed from these initiatives provide the required basics for the implementation of the OER project in schools.

## **UNESCO-Oman Collaboration**

UNESCO has been providing technical and financial support to the Omani government to develop the OER policy. In March 2013, representatives of Oman participated in the Inception Meeting for Implementing the Paris OER Declaration Project in Paris. This meeting was a critical point for Oman to adopt OER and to develop a concrete action plan for implementing the OER policy. It was confirmed that the OER policy would be developed within the ICT Department of the Ministry of Education, under the inter-sectoral programme for ICT investment. A concrete plan for the development of the OER policy, including the establishment of a national OER team, was formulated by the end of the meeting.

Following up on the decision and under the guidance of UNESCO, the national OER team was established through the Ministerial Decree No. 504/2013. The team comprises specialists from the Ministry of Education who are responsible for ICT in education, curriculum development, educational evaluation and examination. The team was designated by the Minister of Education to: oversee the development of the national OER policy under the framework of overall ICT in education plans and policies; approve and manage the plan on the implementation of the OER policy; select and promote the best OER practices; and evaluate the achieved progress.

The National Workshop on the Development of the OER Policy of Oman was organised by UNESCO in November 2013 in Muscat, Oman. The *Strategic Plan for the Policy of Open Educational Resources, Ministry of Education, and Sultanate of Oman* was drafted by the end the workshop and submitted to the Minister of Education

for approval. According to the strategic plan, the OER policy will be integrated in the national project on eLearning and the national programme on the expansion of digital schools, and will be implemented by the Department of E-content and E-learning of the Ministry of Education.

The vision set up for the OER policy of Oman is to harness the potential of OER to achieve the goal of high-quality learning for all Omani citizens and to build a dynamic and sustainable knowledge society. This was designed under the Ministry of Education's mandate of designing and providing education materials, delivering learning opportunities, and encouraging lifelong learning for all Omani citizens to access, evaluate, create and share knowledge for sustainable development. Under the Omani context, the OER policy was expected to help improve the quality of students' learning outcomes and increase teachers' performances. OER would meet both professional and academic demands, address the needs of labour markets and support research. The following objectives were developed under the policy framework:

- Adopt open licence for curricula and textbooks.
- Develop resources and tools and adopt open licence for teachers.
- Develop learning resources and adopt open licence for students.

Open-licensed professional development resources are made available through the Oman Educational Portal.

To ensure the practicability of implementation, 12 schools of Grade 5 and 6 will be targeted during 2014–2016 to pilot-test the policy. Both qualitative and quantitative indicators have been defined for the purpose of monitoring and evaluation. For example, at least 25% of teachers need to develop and use OER within their classes; the number of open-licensed educational resources needs to increase; and the number of participants who are involved in both national and international ICT competitions for creating educational resources needs to increase.

Considering society as a whole, the strategy was also developed to raise community awareness of the potentials of OER in improving teaching and learning quality.

UNESCO has also provided support for the development of a teacher training strategy to increase teachers' competencies in using and creating OER under the ICT-CFT (UNESCO, 2011). Based on multiple workshops supported by UNESCO, the teacher training strategy was drafted to identify the skills teachers have to acquire to apply ICT and OER in education. The training course for trainers on OER has been developed and an electronic system and learning management system have been set up to provide a platform where materials and resources for training will be uploaded.

## **National Efforts**

International collaboration has brought the blueprint to Oman for OER implementation, while solid operational efforts and collaboration at the national level are helping the Omani government transfer the hardcopy policy to actions in the field. Realising that the development and implementation of OER policy requires cross-sector co-operation, the Ministry of Education

invited the Information Technology Authority (ITA) to join the mission so that responsibilities are divided into development of relevant policies and strategies by Ministry of Education and development of regulations and laws on open licensing and open standards for OER by ITA. The ministry and ITA have been co-operating in providing translated openly licensed educational materials, building a platform for teachers, developing and sharing materials, and raising awareness of OER amongst educators and stakeholders in Oman.

**Technology infrastructure** – The current infrastructure condition in Omani schools is not sufficient for effective OER implementation because of poor Internet connections, lack of integrated networks in the schools, and lack of technical devices. Taking responsibility for providing relevant hardware, the Directorate General of IT, Directorate General of Projects and Maintenance, and telecommunication companies are dedicated to improving the effectiveness of Internet service, providing integrated networks at least within schools, and providing devices that cope with the ministry’s basic technological requirements. Strategies proposed to achieve this include co-operating with Oman telecommunication companies on 4G networks, increasing the electricity capacity in schools, and estimating the number of devices needed. Unless the basic technological supports are accommodated at school levels, OER policy cannot move forward.

**Educational Portal** – The current Educational Portal is a server, administrative and financial system that provides few educational services for teachers, students, parents or staff of the Ministry of Education. To make it more capable of supporting eLearning, the Directorate General for IT has decided to purchase a systems licence and compose a working team, defining clear responsibilities for OER-related activities. Now e-content, eLearning and OER will all be managed under their own systems and be accessible to all users.

**Educational resources and tools (for teachers)** – Before the launch of the 2012 Paris Declaration on OER, Oman had implemented several content-relevant projects. Although existing resources in several proprietary and non-proprietary formats are available, there are very few resources for Science and few in the Arabic language. To fill in the gap, the Directorate General of Curriculum Development, together with the E-content and E-learning Department under the Ministry of Education, decided to take action to increase production in e-content and provide guidance on using OER. Relevant strategies include:

- identifying the concepts of e-content needed to be produced in terms of curriculums;
- selecting the best e-content designed by teachers;
- uploading e-content in the OER Educational Portal; and
- involving researchers and experienced authors in contributing e-content.

**Learning resources (for students)** – Similar to the situation for teachers, students have benefited from previously launched projects such as e-courses and many other educational tools (including CDs, books and audios) and e-activities. Yet all those resources are neither accessible nor abundant as

OER. Students therefore need OER for further improving learning quality. Together the Directorate General of Curriculum Development, Directorate General of IT (with the Research Centre), National Records and Archives Authority, higher education institutions, and Legal Affairs in the Ministry of Education implemented a work plan with the following objectives:

- Activate OER completely and in all curricula and educational phases in accordance with 21st-century demands.
- Diversify OER for lifelong learning.
- Use OER to conduct research and studies.
- Encourage students to provide OER.
- Increase the level of awareness in forming the Omani identity.

Strategies in the action plan involve various stakeholders and require support at the national government level:

- Training students on the skills of implementing OER.
- Establishing partnerships with national research projects, such as the Oman Encyclopaedia Project for further furnishing the OER implementation.
- Involving researchers and authors in providing e-content.
- Outlining the policy for publishing OER on social media to make OER more available to everyone.
- Launching a plan for information security.

**Professional development** – ITA has worked hard in the past few years in addressing technological awareness and conducting IT training (especially for civil sector employees and educational stakeholders). As a result, ICT in professional development is growing, making the situation for OER implementation more favourable. As of now, the Directorate General of Human Resources Development, Directorate General of Information Technology, and Specialist Centre for Teachers’ Training have been able to provide training courses on IT and communications, both for the ministries and for the governorates. Distance training is also an option through the Educational Forum in the field of ICT in education. Training is not limited to technology, but also includes training in teaching methods.

The Omani government wants to improve:

- forming a detailed plan of training courses on OER;
- aligning the detailed plan with the Ministry of Education’s career development plan;
- empowering teachers through OER so that they have the capabilities and skills to survive all aspects of life rather than teaching only; and
- making open-training resources available.

The strategies for improvement are highly practical as they are linked with both on-the-job training and accreditation:

- Creating a training programme to develop and use OER.

- Identifying the type of suitable trainings (synchronous or asynchronous).
- Producing e-training materials for OER so that the target groups can gain experience and skills throughout the training.
- Issuing an academic accreditation for ICT for education training programmes.
- Forming an on-the-job team to follow up in schools to measure the achievement of objectives.

**Curricula** – As curricula are important in the Omani education system, especially after the reform of the Basic Education sector, they are a primary concern of the Omani government. Thus, more governmental agencies are involved, and this requires more concrete objectives and planning. The current OER situation in curricula reflects that government still has a long way to go to achieve its goal of improving quality and increasing access. Although previous projects, as mentioned earlier, have allowed all textbooks and teachers' guide to be available in electronic format in the Textbook Production Centre, only 10% of books are available in any accessible portal.

The following action plan has been laid out to address the challenge:

- Create a specialist team to transfer all textbooks and teachers' guides into electronic editions.
- Contract with a specialist company to transfer books into tablet- and smartphone-compatible formats by co-operating with the e-content and E-learning Department.
- Upload electronic editions of the textbooks and teachers' guides to the Educational Portal in a format that suits all users, including users with special needs.
- Design an electronic page for the Directorate General of Curriculum Development in the portal to enable teachers and supervisors to add comments about the curricula directly to the specialist department and activate social media (e.g., Twitter).
- Create a team to form a legal framework for copying and intellectual property rights of textbooks and set regulations to use OER that conform with the country's privacy laws.
- Provide a definition of, and guidelines for, OER and how to use them.
- Prepare a media campaign to raise the awareness of OER.
- Implement workshops to enlighten staff working on curricula of the OER.
- Observe other countries' experiences with implementing OER.

## Challenges Ahead

The current challenges in OER implementation come from both internal and external realities. Externally, infrastructure and technological support have not reached the level for cross-country launching in all schools. Much more is needed to secure adequate Internet, electricity supply, and capable staff who can monitor

and implement the process. People may argue that because teacher training on ICT in education is strong in Oman, it should be in good condition with functioning technology without the need for extra support. However, the reality presents a different story. Teachers' willingness to be trained in ICT is actually slightly lower than expected, and the high cost of training is hard to justify. Especially given that the size of training groups has been small each year, the opportunity cost is too high to maintain a stable plan of ICT teacher training. Though the training lasts for five days and consists of face-to-face instructions, the lack of sufficient devices back at schools has made the training ineffective. When teachers are trained in ICT skills but are not able to apply them in teaching and learning, their willingness to participate declines further, creating a negative cycle of lack of incentives for ICT and OER for education.

Oman lacks Arabic and Science OER and other digital content. These are essential if Oman is to realise its OER policy of increasing educational quality and generating knowledge. Science (or STEM subjects in general) are economic drivers that can help the country develop based on knowledge rather than physical resources. When OER are defined to be used in in-class and out-of-class contexts, the local language is the most powerful tool in applying to both circumstances. Teachers are already encountering enough obstacles in integrating OER in class. If there are few Arabic materials for them to prepare for their lessons or to use in class, the plan for OER integration may be stalled until relevant materials can be found. Oman has high literacy rates (in Arabic) for both adults and youths. When people seek learning opportunities on their own, they generally have to seek Arabic readings in their field of interest because that is the language they are most familiar with (and maybe the only one they know). Thus, enhancing access to Science and Arabic digital content will contribute highly to education in Oman.

Monitoring and evaluation is a big gap in the Omani OER policy. The only relevant portion being added to the plan at this moment is content assessment, which helps ensure the quality of available resources. However, OER carry more than just content. The implementation of infrastructure needs constant monitoring to ensure that the implementation stays with the timeline and is effective for learning and teaching purposes. Professional development efforts include follow-up after trainings sessions, but there is no concrete decision on how this functions.

As the OER policy comes with objectives that are both qualitative and quantitative, it would be helpful to design indicators around them in order to get the monitoring and evaluation process started.

## **Current Progress and the Future Plan**

### **Field application of the OER project by 2015:**

- Prepare trainers based on the curricula developed in the third workshop.
- Organise an official ceremony for the launch of the strategy plan developed during the first and second workshops. Develop a media plan to raise awareness of OER.
- Do follow-up assessment of schools. Use measures to monitor and evaluate progress in the implementation of the strategy in a continuous manner. This will include three fundamental components:

- a detailed survey on current teachers' ICT capacity level
- an Internet-based follow-up system that identifies responses to gaps identified in the teachers' ICT capacity level survey (the system will be updated continuously by professional development programme providers to track progress)
- an external audit by an external agency one year after the implementation, along with annual feedback reports that aim to improve the strategy

**UNESCO's expectation on assisting Oman with future OER implementation:**

- Build teacher ICT capacities for classroom activities.
- Ensure optimal use of OER for educational purposes.
- Train teachers to integrate OER (produce, use, re-use and develop) to support educational purposes.
- Establish a group of ICT expert teachers to harness OER to support the project.
- Develop and produce appropriate OER that fit the Omani curricula and make them available for learners.
- Develop national OER policies.
- Support the application of ICT-CFT in the education process by teachers.
- Create more awareness of the importance of OER.

**National expectation of OER policy towards 2016:**

- Adopt open licences for curricula and textbooks.
- Develop resources and tools and adopt open licences for the teachers.
- Develop learning resources and adopt open licences for the students.
- Make open-licensed professional development resources available through the Oman Educational Portal and through the Digital School programme's ICT devices and Internet connection.

Collaboration is a keyword in the Omani case of OER implementation. Collaboration at the international level is significant because UNESCO has been actively involved to various extents in different events. Public-private partnerships are observed throughout the process because telecommunication companies have been involved to assist with infrastructure and Intel International will soon join the process to provide consultancy to all phases of implementation.

At the national level, different stakeholders both inside and outside of the Ministry of Education have been invited to participate from the initial stage of policy development to minimise the time and effort in convincing them of the effectiveness of OER and receiving their comments out of their political, social and economic interests. The level of commitment in collaborating towards implementing the OER policy will likely carry Oman further in the future.



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## The Polish Open e-Textbooks Project as a Policy Model for Openness of Public Educational Resources

*Alek Tarkowski*

### Abstract

The goal of this chapter is to describe the development of open e-textbooks in Poland, within the broader context of the introduction of information and communication technologies (ICTs) into schools. We consider these projects as attempts to modernise education and create cheaper access to key educational resources. Openness proved to be an attractive concept, reinforcing the key goals of educational reform in Poland. It was introduced five years ago into a key ICT in education initiative, the Digital School programme, as an instrument for enabling broader access and usage of educational content. However, openness has not become a main goal of policy efforts and has not received strong political support during the implementation of the programme. We describe the Digital School programme and its open e-textbooks component within the context of ICT in education initiatives launched since 2000. We then describe the openness model developed as part of the programme and its implementation afterwards. We also consider the public debate surrounding the programme and its effects on the market. Finally, we describe a follow-up Open Educational Resources (OER) project, the open primer textbook for first grade, and consider the possibility of developing in Poland a general policy for openness of educational resources.

### Introduction

The goal of this chapter is to describe the development of open e-textbooks (electronic textbooks) in Poland, within the broader context of the introduction of information and communication technologies (ICTs) in schools. We consider the e-textbooks project as an attempt to modernise education and create cheaper access to key educational resources.

Openness of educational resources<sup>1</sup> proved to be an attractive concept, reinforcing the key goals of educational reform in Poland. A requirement to produce Open Educational Resources (OER) was introduced into a key ICT initiative in education in 2010 — the Digital School programme — as an instrument for enabling broader access and usage of educational content. However, openness of resources has not become a key goal of policy efforts and has not received strong political support during the implementation of the programme. The programme should therefore be seen as a partial success. On one hand, it is one of few examples of the adoption of the OER model for large-scale provision of public resources. On the other, there is uncertainty about whether the Polish government will commit to this model in the future.

This chapter starts with a presentation of ICT initiatives in Polish education. Afterwards, we present the development of the Digital School programme, with a particular focus on its OER component, the e-open e-textbooks project. Afterwards, we provide an analysis of effects of the project on the textbook market, and an overview of key policy debates surrounding the project.

## Background

The Polish government has been intensively supporting ICT initiatives in education since the end of the 20th century. In Poland, it is in this broad context that OER policies initiated after 2010 have been framed by decision-makers. This might seem like an overly broad way of framing the issue. Yet it has proven, in the Polish context, to be as important as the more narrow focus on the public provision of educational resources and its effects on the market. Furthermore, issues such as availability of ICT equipment and access infrastructure, or teachers' digital competences, are key factors that determine the ability of the Polish school system to adopt OER.

Between 1999 and 2005, a major programme, called Computer Classroom in Every School, provided equipment (sets of 10–15 computers with additional equipment and software) to over 11,000 schools. This project continued until 2008, using European funds made available after Poland's access to the European Union. At the end of this programme, almost 20,000 schools (about 80% of schools in Poland) were equipped at a total cost of Polish Złoty 2.2 billion (about USD 700 million). As a result of these activities, the number of students per computer with a connection to the Internet dropped from 41 in 2002 to 12 in 2008 (Ministry of National Education, 2010b). At the same time, a series of teacher training programmes in ICT were initiated, but training was provided to only 40,000 teachers (about 6% of all teachers in Poland).

In 2003, an online educational portal called Scholaris was launched, with the goal of supporting teachers working in rural areas. By 2008, there were 29000 learning objects available on the portal. By 2011, however, the portal had not gained mainstream popularity in the educational community. Despite attempts at upgrading the service, it had not been able to respond to rapidly changing needs

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1 In public debates on the availability of publicly funded resources in Poland, the terms “open” and “openness” are often used in an imprecise manner, denoting any form of broad, free availability of content. At the same time, as shown further in the text, a precise definition of openness has been introduced through the governmental e-textbooks programme. In this chapter, we use the term “open” in accordance to the definitions adopted in this programme.

of users and was facing sharp criticism from experts (Śiwowski and Grodecka, 2013; Sysło 2011).

These initiatives have been developed and conducted mainly by the Ministry of National Education with the support of the Central Teacher Training Service, which was later renamed the Center for Educational Development. Additionally, since primary, secondary and vocational education in Poland is decentralised, with schools being administered and financed by county governments, many ICT initiatives in education have a regional or local character. For example, schools in some regions have been supplied with more computers than others and some have even employed “1-to-1” schemes, along with more teacher training and a better range of other resources.

In 2009, a new core curriculum was introduced, making use of ICT in the classroom compulsory. Additional changes in educational law allowed digital educational resources — electronic textbooks in particular — to be used in teaching. In 2010, the Council on Information and Media Education (CIME), an advisory body to the Minister of Education, published a report with recommendations on the use of ICT in education (Ministry of National Education, 2010a). The document aimed to define goals for ICT development and implementation in Polish schools, based on a diagnosis of the current situation. According to the council, students at that time did not have the opportunity to use ICT other than in computer science classes, and teachers lacked the skills to both properly implement ICT in education and teach necessary skills and knowledge to students. Furthermore, while ICT equipment had become commonly available, schools often lacked Internet access, as well as resources (including software) to use on the computer.

In the report, OER are recognised as an important element of digital learning environments. According to the CIME, these are necessary for enabling proper use of digital technologies by Polish schools. Creation and publication of OER are defined in the report as key strategic goals of the proposed educational strategy. However, OER are defined imprecisely, as resources that are open for all creators and users, and also for active use — although no formal definition of openness is provided. Authors of the report stress the importance of quality assurance and classification of resources (Ministry of National Education, 2010a, p. 30).

In 2010, 90% of primary schools had an ICT-equipped classroom and 93% had Internet access. In lower secondary education, 80% of schools had an ICT-equipped classroom and 83% had Internet access. While these figures seem relatively high, the quality of Internet access was insufficient. The extent to which ICT was used by teachers in teaching was seen by the ministry as insufficient. There was, in particular, a need to move the use of ICT from computer science lessons, taught in the dedicated classroom, to other subjects taught by other teachers — as required by the new core curriculum (Ministry of National Education, 2010b).

The government therefore decided to launch a new ICT in education initiative. Already in 2008, Prime Minister Donald Tusk announced that a working group was created with the goal of developing a strategy that would provide “Access to a computer for every school pupil” (Prime Minister’s Office, 2008). By 2010, the initiative still had political support. However, beyond the above-mentioned report of the CIME and the provisions of the core curriculum, there has been no official

ICT in education strategy on which such an initiative could be based. Activities in the educational sector were included as part of the Strategy for the Development of the Information Society for the Years 2007–2013, developed by the Ministry of Internal Affairs (responsible at that time for Information Society policies).

The plan for a new ICT in education initiative, developed by the working group formed in the Chancellery of the Prime Minister, was initially focused solely on equipment purchases. The planned goal was to shift the general ICT in education model from specialised ICT classrooms to equipment available throughout the school, or possibly even assigned to individual students, in a 1-to-1 model. A consultation process was launched, which included key ministries (including Ministry of National Education, Ministry of Infrastructure, and the Chancellery of the Prime Minister), and business representatives, educational non-governmental organisations and experts. Key discussions during the consultation concerned whether a 1-to-1 laptop programme should be implemented. The discussions also addressed the age of students who would receive computers, formal ownership (by the school or student's parents), and specific funding models.

Yet during this process, it soon became clear that such a programme would not address key challenges related to providing ICT in education and modernising schools in the process.

In two years, the plan for the new initiative has significantly changed. Providing computers to pupils — seen in the popular debate as the most simple and visible sign of modernisation through ICT — became just one of the elements. The provision of publicly funded OER became another key part of the programme.

## **The Digital School Programme and the e-Textbooks Component**

In April 2012, the Council of Ministers approved the governmental Digital School programme. This multi-year governmental programme was designed as a pilot for a larger, future initiative that would cover the whole school system in Poland. The programme consisted of four components (Council of Ministers, 2012):

- e-teacher: preparing teachers for teaching, communicating with students and parents, and documenting the educational process using ICT;
- e-textbook: producing public digital educational resources and ensuring access to free and open e-textbooks;
- e-school: providing schools with the necessary infrastructure, especially modern ICT didactic equipment; and
- e-student: providing students, especially those at risk of digital exclusion, with access to computers and other ICT equipment.

The stated aim of the programme was to develop and improve ICT-related skills of teachers and students in primary and secondary education. Through these measures, digital competences of teachers and students would be increased. A shift and modernisation of teaching methods was also expected. Planned results included: greater personalisation of teaching, greater engagement of students in learning, an increased rate of knowledge acquisition by students, greater work satisfaction among teachers, and a lower digital divide. The emphasis on skills was

a deliberate and significant switch from previous, equipment-based approaches. Equipment provision has been defined as a secondary, supportive measure.

This initial pilot was planned to include 400 selected primary schools (with a focus on fourth-grade classes and students) in the e-school, an e-students component, and over 1,200 teachers in the e-teacher component. Both were planned for the school year 2012/2013, during which selected schools, which received training and equipment, were expected to conduct a set amount of lessons with the use of ICT tools. The programme has been devised to coincide with the introduction of a new core curriculum for the fourth grade of primary schools. The e-textbook component was planned for years 2012–2015. A long textbook production process necessitated the longer time span.

The project was provided with mixed funding from the state budget and European funds. About Złoty 20 million (6 million USD) were allocated for teacher training; Złoty 55 million (USD 18 million) for equipment purchases; Złoty 56.5 million (USD 18 million) for content production; and Złoty 5 million (USD 1.5 million) for the additional research study. With regard to teacher training and equipment purchases, 20% of the costs were covered by local (county level) governments (Council of Ministers, 2012).

The national Center for Development of Education was charged with coordinating the programme and leading work on some of its components. The Ministry of National Education oversaw the programme. The Institute of Educational Research was charged with running a basic evaluation programme during the pilot.

## **The e-Textbooks Component as an Open Educational Resources Policy**

The Digital School programme included, as one of its four strategic goals, the production of a set of open e-textbooks, covering the whole core curriculum for primary and secondary education. The result was 62 textbooks, in 14 subjects that form the core part of the new curriculum for all 12 grades of primary and secondary education, with more than 5,000 study hours, at a cost of Złoty 45 million – about USD 15 million. In addition, this initiative includes the creation of 2,500 supplementary resources to be made available on the Scholaris website, which was being updated in parallel. Furthermore, educational TV programmes for schools, prepared by the public broadcaster Telewizja Polska and made available on its educational platform, were funded.

This e-textbook component has been designed to provide high-quality, public educational resources to be used with the equipment purchased by schools. Altogether, about Złoty 56 million (USD 18 million) were allocated to this component, with the majority of the funds (Złoty 45 million, or USD 15 million) assigned to the production of e-textbooks.

According to a resolution of the Council of Ministers (2012), all copyrighted content funded within the Digital School programme will be:

- made available under the Creative Commons Attribution licence (CC BY) or another free licence — one that allows use of resources and their derivatives without payment and in an unlimited, nonexclusive manner;

- made available in at least one open format (with full specifications available without technical and legal limitations); and
- in the case of Web access, made available in accordance with the current W3C Web Content Accessibility Guidelines (WCAG).

In this manner, a very strong OER policy has been defined, which not only includes a strong licensing requirement, but also takes into consideration technical formats and accessibility standards. This exceeds the minimal standard set by the 2012 Paris Declaration on OER. As such, this programme can be viewed as being exemplary for other public OER initiatives.

The resolution of the Council of Ministers, which authorised the programme, includes a very thorough and strong definition of openness that conforms with the UNESCO and Hewlett Foundation definitions of OER (Creative Commons, 2010): “Openness of educational resources means public, libre and gratis access in chosen place and time,<sup>2</sup> including access without technical barriers and limitations, and freedom of use” (Council of Ministers, 2012). The document also clarifies that the uses can be both non-commercial and commercial. Interestingly enough, an internal discussion on whether commercial uses should be allowed as well focused not just on effects on the publishing market. Just as important was a discussion about perceived difficulties with commercial use of resources funded with European funds. Ultimately, the issue was settled and the ministry went on to clarify that Creative Commons licences, which allow commercial use, can be used for all works funded through the Human Capital Operation Programme — a major source of funding for educational activities between 2007 and 2013 (Minister of Education, 2012).

The Center for Development of Education has been responsible for the creation of the e-textbooks. Since the programme does not define in detail the form, functionalities or use scenarios of the e-textbooks, these issues have remained unclear until now — the very end of the programme. The ministry has been defining the e-textbooks as a basic set of electronic textbooks, easily available to use on any computer or tablet device and fitted into the core curriculum. The centre has been working with four institutional partners responsible for the creation of resources (each one for a group of related subjects) and one technical partner, responsible for creating an e-textbooks platform. Fragments of e-textbooks were released as pilots and beta versions in September 2013.

## **OER Community and Policies Before 2012 as Context for the e-Textbooks Project**

In 2012, when the Digital School programme was launched, OER had already been used in Poland for at least five years. Previous efforts, both by the public administration and grassroots initiatives, have formed an important base for the open e-textbooks programme. Especially important was a history of former use of Creative Commons licensing in the public education sector. Starting in 2008, the Center for Development of Polish Education Abroad created a modular open textbook for Polish schools abroad. Similar to the Digital School programme, the project was based on an open, modular platform (similar to Connexions) and all

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2 “Access in chosen place and time” is a Polish legal definition of online access.



content was freely licensed under a Creative Commons Attribution-ShareAlike licence (CC BY-SA) (Center for Development of Polish Education Abroad, 2012).

The fact that the programme was aimed at Polish schools abroad created a “safe harbour” for experimenting with the requirements for textbook provision and distribution. An open licensing model and free availability online made particular sense in this context, as it facilitated global distribution and allowed for adaptation of resources to local conditions. However, access to this platform was limited to teachers with appropriate accounts. The adoption of an OER requirement for this project was largely due to the involvement of Jarosław Lipszyc, president of the Modern Poland Foundation and one of the key advocates of open education in Poland.

Besides the Center for Development of Polish Education Abroad, several ministries and institutions have been implementing open licensing in their projects. These include:

- Polish Aid, a developmental grant programme of the Ministry of Foreign Affairs. Since 2010, it included a requirement to release copyrighted content under a Creative Commons licence.
- In 2012, the Ministry of Culture and National Heritage introduced similar rules for its media education grant programme.
- The Orange Foundation, a major private charity, has a free licensing requirement in its cultural education programme that started in 2009 (Hofmohl et al., 2012).

The Coalition for Open Education conducts community building and awareness activities in Poland. The Coalition was formed in 2008 by four founding member organisations: the Modern Poland Foundation, Creative Commons Poland, the Association of Polish Librarians, and the Wikimedia Poland Association. The coalition’s mission was based on the goals set in 2008 by the Cape Town Declaration and included community building, outreach and advocacy activities in support of OER in Poland. By 2012, the coalition had 20 member organisations and had built a reputation as an important voice in discussions on open and digital education. Coalition members have been involved in discussions and working groups leading to the creation of the Digital School programme and had an important role in defining the final shape of the project, and the e-textbook component in particular (Coalition for Open Education, 2012) .

The previous implementation of the OER requirements for public resources and the existence of the Coalition for Open Education were important for adopting the e-textbooks project. Implementations meant that there is a prior policy history for open education. In turn, the coalition provided both expert advice and public support for the project, especially in the face of criticism from publishers.

## **Open e-Textbooks and Textbook Production in Poland**

The plan to create public, open e-textbooks signalled a major change in the textbook production model in Poland. Until the start of the Digital School programme, all textbooks were commercially produced by educational publishers, without direct support from the state (although publishers did regularly obtain grants, used to fund textbook development). The ministry’s role was only to

certify textbooks as compliant with the curriculum. Afterwards, teachers would select titles for use in the coming school year and parents would be required to purchase the textbooks (together with additional materials, like exercise books). The Ministry of National Education provides subsidies for textbook purchases for low-income families (about Złoty 140 million, or USD 47 million). The textbook market, valued at about Złoty 1 billion (USD 330 million), is responsible for up to one-third of all book sales in Poland (Strycharz, 2013).

In 2009, alongside the new core curriculum, new rules were introduced regarding the selection of resources for teaching. Teachers were given the freedom to individually select educational resources with which to teach. In principle, they no longer had to use a textbook. However, in practice, it is estimated that almost all teachers still relied on commercial textbooks as the core teaching resource. These new rules therefore failed to increase innovation and creativity among teachers. At the same time, publishers began providing teachers with free teaching guides and supplemental resources. These are commonly seen as being a key factor in introducing new teaching practices to a typical teacher, even though they have been developed in a “one size fits all” approach.

Also in 2009, the possibility to use digital textbooks was introduced. Yet, by 2012, only one born-digital textbook and eight e-book versions of paper textbooks were available. In 2013, according to the Ministry of National Education, 20% of the 624 certified textbooks had a digital component (usually a static PDF file created from part of the original textbook) and only 5% had some sort of multimedia component. Commercial offerings were seen as outdated and not innovative. Publishers have also been criticised for overly high textbook prices and improper practices, such as bundling textbooks with exercise books and thus making it impossible to resell a textbook.

The aim of the e-textbook initiative was thus to provide a public alternative to the commercial offerings. It was seen as cost-effective — due to the use of open licensing, which made a textbook freely available, as it has been publicly funded. It was also expected to be more modern and innovative in terms of the use of digital technologies and pedagogical models associated with them.

Textbooks can be seen as an obvious choice for an OER initiative, and an ambiguous one from the perspective of broader educational reform. Textbooks are obviously a key resource in education and one that generates the largest costs for parents in Poland. Targeting only supplementary resources (such as content created for the Scholaris textbook) would not have a similar effect. At the same time, a reliance on textbooks is commonly seen as a barrier to developing a more modern, personalised pedagogy in Polish schools. Proponents of such modernisation expect teachers to be more active in selecting, or even creating, educational resources. While such an assumption is also at the heart of the OER movement, greater engagement on behalf of teachers cannot be achieved solely through policies focused on content provision.

In principle, this goal could be achieved with proper training as part of the Digital School programme. But the implementation of the training component has not been sufficiently focused on open education to achieve such a goal. Similarly, creation and re-use of resources could be encouraged based on the development of the Scholaris platform. Yet no such activities have been undertaken, and Scholaris

has been relying on a formalised content provision model, solely by educational institutions. In 2013, some of these resources (1,000 of the estimated 26,000 units) have been made available under an open licence.

## **Public Discussion on Open Textbooks**

Reforms that introduced the concept of OER to the Polish public debate on education were of interest to many stakeholders. The government and its administration were looking for ways to make content cheaply and effectively accessible. Activists and NGOs advocated firmly for a relaxed copyright regime for digital content, based on the vision of accessibility of publicly financed content. The decision-makers have internalised this latter point. However, the well-established market for textbooks and other educational materials saw openness as a major disruption to their traditional business model.

As expected, publishers have been critical of the open e-textbooks concept from the very beginning. Despite two years of consultations and negotiations prior to the programme's launch, the publishers boycotted it immediately. In 2010–2011, publishers voiced their concerns while the e-textbook programme was being developed. Throughout 2012, the publishing industry staged massive criticism of the programme in the media. The publishers accused the government of unfair competition on the textbook market and warned of a possible shrinking of this market, with negative effects not only on the publishing industry, but also on booksellers (for whom textbooks are a major source of income, and constitute about one-third of the whole book market). Concerns have also been raised about the quality of publicly funded and created content. In 2013, critical media coverage and opinion pieces by publishers' representatives continued to appear in the media. In 2014, the criticism shifted towards a new textbook project for early education, which was seen by publishers as an even greater threat to their business models.

When the Ministry of National Education decided to contract public universities to produce textbooks (in mid-2012), representatives of the publishers threatened these universities with legal consequences. According to the publishers, producing open textbooks would be an act of unfair competition — but others saw this as an attempt to intimidate the institutions and cause a chilling effect that had no legal basis.

Multiple critical statements about the programme were published in the media, mainly by representatives of the publishing industry within the first six months of the programme's launch. Several of the most prominent publishers formed the Contemporary Education Alliance, which opposed Digital School through a communications campaign that lasted several months. Personal accusations were also made against people involved in the programme — directed at the Deputy Minister of Education, the co-ordinator of the e-textbook component, and others.

At the beginning of June 2012, Polish publishers, supported by the Federation of European Publishers (FEP) and the International Publishers Association (IPA), sent a letter of complaint to José Manuel Barroso, the President of the European Commission (Federation of European Publishers, 2012; International Publishers Association, 2012). In the letter, they protested against introducing public e-textbooks into the Polish education system through the Digital School

programme. The publishers accused the Ministry of National Education of violating the rules of fair competition and blamed the programme for an attempt to establish a state monopoly, arguing that no textbooks would ever be sold once open textbooks were made available. The European Commission later decisively backed e-textbooks in their reply to the publishers, saying (Eckert, 2012):

“Nowadays digital technologies are the source of transformations that influence the public sector and all aspects of functioning in the main branches of economy. It is inevitable that these technologies challenge existing systems of formal teaching in all EU member states.”

At the same time, the voices of teachers and parents were practically not present in the public discussions on open e-textbooks. Among teachers, debates concerned quality of content and the availability of additional resources for teachers. These have traditionally been provided by commercial publishers and have been seen by teachers as crucial aids. These resources have also been criticised for standardising teaching and lowering teachers' initiative and engagement. Yet public e-textbooks have not yet been identified as an alternative. Lack of interest on the part of teachers might be due to the fact that they have not yet had the opportunity to teach using the new resources.

Parents and students are the last group affected by the e-textbook programme. Traditionally, they had no influence on the selection of textbooks, although the books had to be purchased by families in the market. This marginalisation of parents in the public debate might explain their low engagement in debates on OER, despite the fact that adoption of OER means significant savings for Polish families with school-age children.

## **Implementation of the e-Textbook Project**

The public debate was largely finished by the time the programme had been formally approved and launched. As mentioned before, the e-textbook project was, from the start, administered by the Center for Educational Development. The centre organised five tenders to select contractors: four for creating the textbooks and one for creating the online publishing platform. Content production was split into four large parts: early education (Grades 1–3 of primary education), natural sciences, math and computer science, and humanities. This model has been criticised for not providing an opportunity for small publishers to take part. Only large publishers and organisations have the means to create, over a period of three years, several different textbooks spanning whole primary and secondary education.

Ultimately, the centre decided to tender the contracts to public institutions. Only one tender, for early education content, was given to the Grupa Edukacyjna publishing house. It was the only publisher to break out of a general boycott of the tenders by publishers. The other tenders were given to the Poznań Supercomputing and Networking Centre (PSNC) for online platform creation, Wrocław University of Environmental and Life Sciences for natural sciences, Łódź University of Technology for math and computer science, and University of Wrocław for humanities.

In 2014, a beta version of the online platform was made available by PSNC and pilot content was released throughout the year. The platform was built using HTML5 as the content publication standard, on the basis of the Connexions open education platform. In accordance with the programme specifications, the platform meets the following requirements (Centrum Cyfrowe, 2013):

- a multi-platform approach: support for diverse applications and users;
- flexibility: various modes of work among users (on- and offline);
- modularity: the possibility to generate various versions of e-textbooks and afford different functions;
- security: selection and continuous diagnosis of the infrastructure, security, technology, and the process of production, control and integration of the software; and
- scalability: for a growing number of users as well as available digital resources and educational services.

Once the e-textbooks are made available, no funding or resources will be provided for the introduction and implementation of e-textbooks in schools within the scope of the programme. As of writing of this text, the ministry, together with regional governments, is planning further funding for the project within the scope of new EU-funded grant programmes.

While the Digital School programme was based on a concept of synergy between the different components, this proved impossible in practice. This was mainly due to different timing of the components: equipment purchases and teacher training were conducted in 2012 and 2013, while the textbooks will not be made available before late 2015. Furthermore, while the e-textbooks are formally being created as part of a pilot project for 400 schools, their open and digital character means that they can be used by any school, once they are available online.

## **Public First Grade Primer**

In 2014, announcements were made to create a free, public textbook for the first grades of primary schools. By September 2014, textbooks were printed and distributed to all first grade students.

Unlike the e-textbooks, which were assumed to compete with the market offerings, the new textbook was in principle to be the only one used in first grades. Therefore the publishers perceived it as a major threat. Critics, led by the publishers, have already denounced the textbook for having low quality and poor pedagogical value — although no objective evaluation or testing has been conducted by anyone. While nominally also an OER, released under a Creative Commons Attribution licence, the published textbook includes a range of traditionally licensed images and photographs. According to the Ministry of National Education, this was due to a need to quickly create content and graphic design of the textbook. As a result, the textbook cannot be considered a resource that is compliant with open licensing. In late 2014, another two textbooks were being produced (for Grades 2 and 3 of primary education), with similar challenges related to open licensing of graphics.

Textbooks for Grades 1–3 of primary education have been an important source of revenue for publishers since, unlike textbooks for older grades, they cannot be easily resold. Thus, according to estimates, this new policy could cause a decrease of up to one-third of the value of the educational publishing market. As part of the reform, the ministry will in turn provide limited funds for additional purchases of commercial resources. For early education, these are foreign language textbooks and exercise books. Most probably, the new policy may cause a centralisation of the market, as only the largest publishers will be able to create sustainable business models based on the limited public funding.

## **Conclusions: The Future of the e-Textbooks Programme**

OER and open education were not prominent in Polish educational policy documents before 2012. The report by the Council on Information and Media Education is the sole exception. Therefore, the e-textbook project and policy should not be seen as a planned outcome of previously defined policies. Rather, they are a result of successful advocacy that presented pragmatic arguments for OER within the Digital School programme. This has been achieved through the efforts of both open education advocates from the civil society (prominently, the Coalition for Open Education) and public officials supporting this project. These efforts were mainly based in the newly formed Ministry of Administration and Digitization, which co-operated with the Ministry of National Education during the development of the Digital School programme.

Open licensing of the new textbooks, introduced in 2014, can be seen as a further sign of the Ministry of National Education's commitment to the OER model. At the same time, these policy choices have not been supported by any legal or strategic commitments to openness. It should also be noted that the e-textbooks programme and the first grade textbook programme do not seem to be co-ordinated. There is only a general assumption, made by the ministry, that the two types of resources will be used in parallel. In the grades where the printed textbook will be available, it is expected to be the primary resource (leading to already-mentioned criticism about the ambivalence of attempting educational reform based on textbook provision). Finally, the printed textbook is available in digital form only as a PDF file, which is a much lower standard than the one adopted for e-textbooks. This suggests that there is no strategic plan behind the support of OER — or of digital resources in general — by the ministry.

The discussions concerning e-textbooks rarely address the fact that they are OER. The key issues concern a shift from a competition-based commercial textbook market to public provision of textbooks. This became especially pronounced in 2014, when the government introduced the idea of public, printed textbooks that would not coexist with a commercial offer, but replace it. This reaction might be due to the fact that the impact of government's latest initiative on the market will be more radical. Additionally, the impact of e-textbooks remains only a potential as long as they are not yet introduced into the school system.

As of the time of writing this chapter, the e-textbooks were still in a preparatory phase. Until they are available, no evaluation of the final textbooks is possible. It is even more difficult to predict outcomes on the educational market, on teacher practices and on learning outcomes.

The Digital School programme will end once the e-textbooks project is finished and the digital publications are made available online. There is no clear source of funding for supportive measures, such as teacher training, promotion of e-textbooks, or development of new, innovative pedagogies and methods for using digital resources in school. At the same time, 2014 marked the beginning of a new funding formula for grants provided by the European Union for Poland (until 2020). As part of these funds, a large educational funding programme was initiated, through which further development of e-textbooks can be funded. Furthermore, sources for the development of ICT infrastructure and for teacher training can be found in other funding programmes. This will require a high level of co-ordination, which is made difficult by a continuing lack of a strategy for digital education. It remains to be seen whether the Digital School programme will be continued, together with its focus on public OER provision.

While the Digital School programme could be an exemplary model for OER production policy, it has not developed a model for integrating OER into educational practice. This lack of strategic direction and supportive measures may result in a lower-than-possible impact of the policy. Its implementation into practice might ultimately depend on the actions of teachers or schools and grassroots support.

At the same time, a longer-term perspective will be necessary to ultimately evaluate the results of this programme. Introduction of e-textbooks is a challenging initiative that affects many players in the educational sector, all with their own interests. Actions already undertaken by the Polish Ministry of National Education are a significant step towards implementing a sustainable policy for the openness of educational resources. Regulation of this issue through a relevant act of law would provide strong support for these developments in the future.

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## Open Access to Educational Resources Through Federal Portals and OER in Russia

*Svetlana Knyazeva and Aleksei Sigalov*

### Abstract

This chapter focuses on the analysis of a series of intertwined projects implemented in the Russian Federation to establish a system of national educational portals. One of the major purposes of this initiative was to support wider use of Open Educational Resources (OER) in higher and secondary education institutions. The projects were funded by the Ministry of Education and Science of the Russian Federation and implemented by leading Russian universities and research centres.

A series of new projects in open education that follow the concept of Massive Open Online Courses (MOOCs) were initiated in 2014. Dozens of open online courses oriented towards different categories of learners have been developed. The amendments to the Russian legislation related to the intellectual property rights enforced in 2014 made open licences legally valid, which enables open licensing of the content of the national portals. Considerable effort would be needed to receive the permission of authors and rights holders, but this would enable wider opportunities for the use of the resources, particularly to ensure their legitimate use in online courses both for open education and for corporate eLearning systems at higher education institutions.

### Introduction

When considering the current status of Open Educational Resources (OER) in Russia, one should bear in mind that the amendments to the Civil Code concerning the use of open licences were introduced very recently on 1 October 2014 (Federal Law, 2014). Until then, the concept of “open licences” has not been a part of the Russian legislation on intellectual property rights. As a result, open licences (e.g., Creative Commons licences) were rarely used as a legal mechanism

for transferring rights by authors or for defining terms of use of their works. For the distribution of intellectual products (e.g., publication in open access on the Internet), the legislation required the authors to conclude an agreement defining the conditions for the use of works. Thus, in the Russian context, the concept of OER did not include obligatory presence of an open licence. Resources that were accessible to the public could be freely used for educational purposes and treated as OER.

In the past 10 years, in parallel with the efforts to amend the legislation and legalise open licences, the Ministry of Education and Science (MES) of the Russian Federation has supported the production of educational resources and the provision of free access to them on the Internet. Most of the numerous educational resources produced during the recent decade (with only a few exceptions) do not carry an open licence. Nevertheless, a number of large-scale projects, including those that were publicly funded, resulted in the production and wide use of educational resources that, although they did not bear an open licence, could qualify as OER by the terms specified in the Disclaimer or Terms of Use. These projects were implemented in line with the concepts and approaches developed by the OER movement and the experience of OER initiatives undertaken globally and in certain countries (Atkins, Brown, & Hammond, 2007; Butcher, 2011; McGreal, Kinutha, & Marshall, 2013; OECD, 2007).

This chapter focuses on an analysis of a MES initiative aimed at the provision of free access to educational resources through a system of national educational portals and promotion of wider use of digital resources in higher and secondary educational institutions. The chapter contains an overview of the issues related to ICT in education policies, computer and Internet penetration in educational institutions, and readiness to use digital resources. Particular attention is paid to three large-scale projects: Single-Entry Window for Access to Educational Resources (SEW), Integrated Collection of Digital Educational Resources (ICDER) and Federal Centre for Informational and Educational Resources (FCIER). The process of their development and implementation, as well as the results and benefits of the projects, are discussed. The authors also consider modern trends relevant to the development of open education and Massive Open Online Courses (MOOCs) in Russia.

## **ICT in Education in the Russian Federation and Intellectual Property Rights Issues**

### **National Policy in ICT in Education: Federal Programmes and Initiatives**

Of the more than 143 million people in Russia, 13.6 million are pupils and 1.04 million are teachers at 44,700 schools. More than 5.6 million (of them, 2.6 million are full-time) students are taught by 319,000 teachers at 578 public and 391 private higher education institutions (HEIs) (Federal Service for State Statistics, 2014).

The *Federal Law on Education in the Russian Federation* regulating national educational policy was enacted in 2013. This law contains several articles related to the use of ICT in education. In particular, the law regulates the delivery of

educational programmes with the use of eLearning and distance education and the use of digital educational resources.

In the 1990s, a federal-scale strategy was focused mainly on IT infrastructure: equipping educational institutions with computers and setting up telecommunication networks. The largest projects were aimed at enhancing Internet penetration in educational institutions.

A nation-wide research and education network called RUNNet was set up in parallel with the Internet programme implemented by the Open Society Institute in co-operation with the Russian authorities. Launched in 2001, the Federal Targeted Programme called Development of the Integrated Educational Information Environment was the first federal programme that envisaged a holistic approach to the development of ICT in education, including: the provision of equipment/Internet connection and digital resources on CDs to schools; measures for teacher professional development; and establishment of a system of information and educational portals. During 2006–2008, in the priority national Education project, over 50,000 secondary and vocational schools throughout Russia were connected to the Internet. During 2005–2008, the Computerisation of the Education System project created an enabling environment for the systematic and active use of ICT in secondary schools. The most important result of the project was the Integrated Collection of Digital Educational Resources (ICDER), which enabled free access to educational resources for schools.

In 1998, MES established the State Research Institute of Information Technologies and Telecommunications (Informika),<sup>1</sup> a lead organisation, whose mission has been the research, development and application of ICT in education. More than 80 centres were established on the basis of leading universities in most regions of Russia. The centres run projects at universities and on a regional scale.

The current Federal Targeted Programme for Education Development includes measures designed to provide incentives for the development and use of digital educational resources (Ponomarev, Pronin, Starykh, & Tikhonov, 2012). The Federal Centre for Informational and Educational Resources (FCIER) was established and the project Open Class: Network Educational Communities project was launched within this programme.

MES and the Ministry of Communications and Mass Media interact mainly in the field of telecommunications and e-government. For example, they completed a joint project to provide broadband Internet access for schools. Joint projects are carried out by the ministries within the national Information Society programme.

### **ICT Readiness: Computer and Internet Penetration**

Since the early 2000s, the computer to student ratio has been continuously increasing. The total number of computers in schools now exceeds 2 million, of which 1.67 million are used for training purposes and 1.29 million are connected to the Internet. The current ratio is 12.3 computers (9.5 with Internet access) per 100 students.

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1 <http://www.informika.ru/>

Since 2010, these figures have increased by almost a factor of two (Federal Service for State Statistics, 2014; Higher School of Economics, 2013). In recent years, much attention was paid to equipping schools with interactive whiteboards. Now they are available in almost half of all schools. Nevertheless, the speed of Internet traffic still differs in urban and rural schools. The majority of urban schools have high-speed Internet access (10 MB/s and above), whereas the speed is only few hundred KB/s in many rural schools.

In 2013, the number of computers used for educational purposes in HEIs exceeded 730,000 (of those, about 650,000 had Internet access). This means about 25 computers per 100 full-time students (Federal Service for State Statistics, 2014). Most campuses provide wireless Internet access, and most university students have their own laptops and/or tablets and are active Internet users.

An important indicator is the level of computer and Internet penetration in households, as this affects the ability of students to use digital resources at home. In 2013, the share of households with a personal computer was 71.4% (75.6% in urban areas and 58.4% in rural areas). About 69.1% of the households (74% in urban areas and 54.6% in rural areas) had access to the Internet. Over the past five years, these indicators have increased by a factor of about 1.5, and the difference in Internet penetration between urban and rural areas continues to decrease. In late 2013, the number of Internet users in Russia was about 67 million people (age 16 years and older), which was equal to more than 57% of the adult population (Higher School of Economics, 2014).

An important prerequisite for the wide use of electronic educational resources is the enthusiasm of teachers. The development of training programmes for educators in ICT and the organisation of training and certification of teachers are important elements of the national educational policy. In this case, attention is paid not only to general computer literacy, but also to the skills related to the use of electronic resources and the ability to apply them for different training activities. Large-scale ICT training of teachers started in the early 2000s, when the Federation of Internet Education opened over 40 training centres in regions of Russia. At present, training is conducted at regional institutes for in-service teacher training and pedagogical institutes, as well as at municipal training centres based in leading schools. Not only face-to-face but also distance forms of training are used. Annually, more than 100,000 teachers improve their ICT skills. The National System of Computer Literacy and ICT Competences Monitoring and Certification commissioned by the Ministry of Education and Science enables testing and certification in regional certification centres (Skuratov & Svechnikov, 2011).

## **Russian Legislation on Intellectual Property Rights and Open Licences**

Until 2014, the Russian legislation on intellectual property rights did not include the concept of “open licence” and did not provide an opportunity for granting the right to use a resource under open licences, though some experts confirmed that the use of Creative Commons licences<sup>2</sup> would not be a violation of the legislation. In October 2014, a federal law was enacted with amendments to the Civil Code

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2 Creative Commons affiliate in Russia. The Institute of the Information Society ([www.iis.ru](http://www.iis.ru)) maintains the *creativecommons.ru* website.

aimed at harmonising the Russian national legislation for the use of open licences. The new version of the Civil Code allows a copyright holder to publicly declare that any person can freely use his or her intellectual products under certain conditions. Using open licences similar to Creative Commons licences means that an author or another copyright holder can provide a user with an open (simple, non-exclusive) licence to use his or her work. The terms and conditions of such a licence shall be published in such a way that the user could check them before using the product. Acceptance of an open licence by fulfilling the actions specified in the licence (for example, by “clicking”) can be considered equivalent to signing a contract and thus enforces an open licence published on the Internet.

In the Russian-language Internet, open licences are primarily used at the sites designed for open code software and wiki projects. Some sites of official authorities are Creative Commons licensed (e.g., the sites of the Government of the Russian Federation<sup>3</sup> and the Ministry of Communications and Mass Media).<sup>4</sup> Creative Commons licences are not yet often used by educational institutions. However, before October 2014, several organisations (sites) did use the licences — for example, the National Research University – Higher School of Economics,<sup>5</sup> the educational projects Open Science and Open Education,<sup>6</sup> OpenCorpora,<sup>7</sup> Newtonew,<sup>8</sup> WebReference,<sup>9</sup> and the digital library<sup>10</sup> of the St. Petersburg Regional Centre of Education Quality Evaluation and IT.

An example of an initiative using open licensing of scientific and educational resources, undertaken after the amendments to the legislation, is the publication of full-text articles from dozens of scientific journals licensed under Creative Commons Attribution (CC-BY) in the electronic research library Cyberleninka.<sup>11</sup> Another recent example is open licensing of online courses and resources published by Stepic.<sup>12</sup>

## Federal Portal “Russian Education” and Thematic Portals

Set up in 2002–2004, the system of educational portals, including the Russian Education federal portal<sup>13</sup> and thematic portals for various disciplines has become a breakthrough in the development of educational content on the Russian-language Internet. This multi-faceted project was implemented within the Federal Targeted Programme known as Development of the Integrated Educational Information Environment, and has become the largest public project focused on the development of online educational resources in Russia (Ivannikov & Tikhonov, 2003).

Twenty universities and research organisations took part in the project co-ordinated by Informika. As a result, 15 thematic portals were launched. The most outstanding

3 <http://government.ru/>

4 <http://www.minsvyaz.ru/ru/>

5 <http://www.hse.ru/copyright>

6 <http://www.opensciencelabs.ru/>

7 <http://www.opencorpora.org/>

8 <https://newtonew.com/>

9 <https://webref.ru/>

10 <https://rcokoit.ru/library.htm>

11 <http://cyberleninka.ru/>

12 <https://stepic.org/>

13 <http://www.edu.ru/>

among them were Economics, Sociology, Management, Social, Humanitarian and Political Science Education; Natural Sciences; ICT in Education; Legal Russia; and the Portal for General Education. The portals contained diverse information, including education and science news, reference databases of organisations and persons, calendars of events and discussion forums. Important components of the portals were online inventories of resources and repositories of learning and teaching materials. Project participants developed common approaches to technological maintenance and informational support for the portals.

In particular, to ensure uniformity of metadata for the resources, the standard *Metadata of Informational and Educational Resources for Internet Catalogues* was developed and adopted by the community of portal developers. A review of the development of the portals is presented in the book published by UNESCO IITE (Sigalov & Skuratov, 2012).

Establishment of the system of portals allowed for: systematisation of information on educational resources available on the Russian-language Internet; provision of open access to new resources; and widening of the use of the Internet for educational purposes both in Russia in the CIS countries (Badarch, Knyazeva, & Lane, 2012; UNESCO IITE, 2011b). An advantage of the “portal approach” has also been that it provided a best-practice example and served as a prototype for dozens of new educational portals, including regional educational portals within the Russian Federation and thematic portals developed by professional communities.

The lessons learned from the development and operation of the system of portals provided guidance for new Internet projects aimed at the development of digital educational content, namely, Single-Entry Window for Access to Educational Resources (SEW), Integrated Collection of Digital Educational Resources (ICDER) and Federal Centre for Informational and Educational Resources (FCIER).

## **Federal Portal “Single-Entry Window”**

### **Portal Concept and Structure**

The Single-Entry Window for Access to Educational Resources (SEW) project was designed and launched in 2005, as a next step in the development of the federal system of educational portals.<sup>14</sup> SEW was developed with the intention of integrating OER and the resources of federal portals, as well as resources from the websites of universities and other educational institutions, educational Internet projects and individual teachers (Ivannikov et al., 2007). When developing the portal, the SEW team explored the lessons learned in terms of information structure, functionality and user interface from several OER projects. Two main types of projects were considered: Internet catalogues providing structured descriptive information (metadata) about Web-based educational resources stored on other sites (OpenDOAR, Open Education Consortium, COL’s Directory of OER, OER Commons, MERLOT) and OER repositories storing content directly on their sites (MIT OpenCourseWare, OpenStax CNX Library, Open Science Resources, and OER@AVU).

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<sup>14</sup> <http://window.edu.ru/>

SEW includes a catalogue with resource metadata, an open digital library of learning and methodical materials, news and events announcements, a feedback subsystem (forum, questions and answers), and a search subsystem. The integrated catalogue contains metadata of all resources: descriptions of external resources published at other websites and descriptions of materials published in the digital library (Abramov, Bulakina, Ivannikov, & Sigalov, 2014).

All materials in the digital library are stored on the SEW server. The initial version of the portal included only the metadata referring to the resources with references to the files available on the websites of their producers or right holders. However, this approach did not guarantee sustainability in case of changes to the Internet addresses. Restructuring of sites, changing to the use of different Web technologies, etc., often leads to changing of the initial Web addresses. Quite often some pages with collections of resources or even complete sites disappear, especially if these are the sites of departments, research groups and teachers or sites produced by students and hosted for free. Uploading of full texts to the SEW library guarantees their permanent availability and integrity.

### **Portal Content Management**

The catalogue of Internet resources includes metadata from more than 25,000 external resources. A part of catalogued resources are educational websites: those of universities, departments, laboratories, vocational schools, digital libraries, educational projects, etc. Other well-represented types of catalogued resources are educational materials published on different websites: digital textbooks, lecture courses, online tests, virtual laboratory works, etc.

The SEW digital library is the largest repository of OER on the Russian-language Internet. It contains more than 30,000 resources, including textbooks, manuals, courseware, lecture notes, workbooks, learning materials for practical training, laboratories, instructional guidelines, curricula, reference books, monographs, and conference proceedings. Most of the materials are intended for use in higher education. SEW integrates the resources, which are of interest to a broad range of educators, administrators and researchers. These resources would otherwise be dispersed among hundreds of websites of universities, faculties and departments. It is often difficult to find these materials and they could remain inaccessible for teachers and students from other educational institutions. Original materials designed in various formats are collected, converted into PDF and described in accordance with the adopted metadata standard.

New materials are acquired in two ways: through a bulk uploading of resources submitted by providers (universities or their structural units), and by offerings of single resources by individual authors. In the first case, the mechanism of a bulk uploading based on XML import is used. In the second case, a user fills in a Web form, which contains the required attributes of a resource and submits it to the portal for further checking and approval by the Editorial Board.

The digital library does not contain printed books digitised and published in open access on the Internet without receiving the permission from the authors/right holders. It is expected that authors/right holders who submit their materials to the digital library for publication as open access are allowing free dissemination and use for non-commercial purposes. Conditions of publishing materials in SEW

were jointly developed with universities that provided their collections for free. Upon the request of universities, the terms of non-commercial use were applied. This prohibits the use of the materials on a fee basis (e.g., included in publications printed for sale or in tuition-based eLearning programmes). According to the opinion of representatives of universities, many authors would be against commercial use of the materials they provided for free.

## **Challenges and Lessons Learned**

Today SEW is one of the most popular and frequently used educational portals on the Russian-language Internet. The portal has 60,000–80,000 unique visitors per day. According to online surveys, more than 60% of visitors are university students and about 25% are teachers and professors. The total number of full texts downloaded from the digital library can be estimated at over 5 million electronic copies per year (Abramov et al., 2014).

The educational resources presented on the portal are developed in more than 300 Russian universities and other educational and research institutions. The majority of resources are collected through the active contribution of the Editorial Board of the portal and external experts who retrieved and evaluated resources available on numerous websites and then approached right holders of the resources with a proposal to upload their resources to the SEW. Almost 20% of the portal content became accessible after universities, their departments and individual authors approached the SEW.

Communication with universities showed that the decision-makers at many HEIs did not consider providing OER as an important component of university activities. The initiatives of departments and individual teachers to create and publish OER are seldom encouraged and rarely supported. At present, there is an opportunity for improving the situation, because the new criteria for evaluating HEIs include reference to the use and production of electronic resources, eLearning activities and open education. In addition, universities now pay much attention to their position in rankings such as the Webometrics Ranking of World Universities, which takes into account the number of resources available on the websites and, in particular, those indexed by Google Scholar.

One of the key challenges faced by educators willing to publish their materials as OER on the Internet is copyright. The overwhelming majority of learning materials published on the sites of educational institutions do not contain clear guidance on the terms of use.

Recent amendments to Russian legislation allow using open licences. Therefore, additional efforts should be invested in raising awareness about open licences among universities and other educational institutions and encouraging their use by authors. Giving the authors of materials published in the SEW the opportunity to license their resources using Creative Commons licences should eliminate the limitations related to the distribution, use and repurposing of the resources, and will transform the portal into a real OER repository (Abramov, Bulakina, Sigalov, & Knyazeva, 2012).

Summing up the results, one can conclude that SEW is a successful example of a federal initiative aimed at the integration and free provision of educational content. It has made accessible and easily searchable the resources created



at hundreds of education institutions, contributed to the preservation of the teaching and methodological materials, facilitated the dissemination of pedagogical experience, and promoted wide sharing of educational resources. These conclusions are confirmed by the statistics of accessing portal resources, review of resources, discussions in the forum portal, online surveys, and results of the surveys conducted at the universities (Abramov, Bulakina, & Sigalov 2011).

## **OER Repositories for General Education**

### **Integrated Collection of Digital Educational Resources**

The Integrated Collection of Digital Educational Resources (ICDER) portal<sup>15</sup> was designed to integrate all digital educational materials within the Informatisation of the Education System project. One of the main activities of this large-scale project implemented in 2005–2010 by the National Training Foundation under MES was the production of new-generation educational materials. To this end, the National Training Foundation developed new educational resources and purchased already-developed materials from the rights holders and producers for further non-commercial use in the Russian education system. The resources that have successfully passed evaluation and testing in the pilot centres of the project were uploaded to ICDER (Chinnova, Gridina, & Ivannikov, 2009).

The ICDER resources cover all subjects studied in primary and secondary school (from Grade 1 to 11). The content fully complies with the standard curriculum. The total number of resources (resource is a storage unit that has metadata and can be distributed in one or several files) exceeds 110,000. A resource can be a small text document or an image, a full-text electronic manual or a sophisticated simulation programme. The resources are very diverse in terms of data formats: text documents, graphic materials (illustrations, maps and schematics), audio and video materials, flash animations, interactive Java models, e-books, executable and scripts files, and more complex digital resources.

ICDER includes informational materials for self-learning on certain topics, illustrative materials to support learning, performance rating tools, tasks and exercises, tests, reference books, and computer models for practical and laboratory works. Important types of resources include teacher lesson plans, teaching guidelines on how to use the resources, and examples of exercises for students. These materials were developed by the producers of the resources and the teachers involved in their evaluation.

The catalogue has a sophisticated navigation and search system that enables combined context search in the title/abstract of the resources with selection of the subject, grade (year of learning), type of resource, and more.

Since its launch, the portal has been maintained by Informika. In addition to the main portal based in Moscow, more than 10 mirror sites have been set up in different regions of Russia. These mirror sites are being used not only to store the copies of the documents that are available in the main repository, but also to contain regional collections of resources developed by teachers and educators of a particular region. All resources of ICDER were designed for free usage for

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15 <http://collection.edu.ru/>

educational purposes. The terms of use are slightly different for different types of resources: some of them can be used without modification only, others allow for repurposing and modification of the resources.

This portal has always been a very popular Internet site ranked at the top of Russian educational websites. The average daily number of unique visitors amounts to about 30,000; the number of pages viewed daily is about 100,000.

## **Federal Centre for Informational and Educational Resources**

The Federal Centre for Informational and Educational Resources (FCIER<sup>16</sup>) is one of the flagship projects of the Federal Targeted Programme for Education Development. This large-scale project, launched in 2007, was aimed at developing hardware and software infrastructure that would support the storage of various types of digital resources in a central data repository, enable free access to resources, and provide Web hosting and e-mail services for schools (Bolnykh, Kuznetsov, & Kondaurov, 2010). In addition to setting up IT infrastructure, the project supported: the development of new educational materials in order to promote more efficient use of digital resources for studying basic school disciplines; the introduction of new didactic approaches and methods; and the improvement of student satisfaction with the learning process.

The core of the educational content of FCIER is the collection of interactive multimedia modules that were developed for FCIER. The modules were developed within the concept of an open educational modular multimedia system (OMS) and meet uniform technical requirements (Osin, 2010; UNESCO IITE, 2011a). There are three types of modules: narrative (explanation of the content); practical (virtual laboratories and practical works); and control (different types of tests). Each module is autonomous and designed to solve a certain learning task. The modules are run using a special OMS-player, which is open source software that can be run with Windows and Linux.

Today, the FCIER repository contains over 15,000 modules for 14 main disciplines of secondary education (e.g., Mathematics, Physics, Chemistry, Biology, History, Geography) and more than 12,000 modules for many vocational education disciplines (e.g., food industry, auto mechanics, machinery, automatic control, welding, chemical engineering).

The open architecture of OMS and the structure of the learning modules make it possible to modify the content (text, images, and animation) and the scenario of modules. However, to be able to do that one should have advanced ICT skills and experience in the development of multimedia. Therefore, modification and amendments to the modules are not very frequent practice at schools and teachers mainly use the FCIER modules unmodified. At the same time a number of multimedia developers successfully used FCIER resources as a basis for the development of new interactive resources (one of the examples is the Moscow Media Centre for Educational Resources).

The terms of use of FCIER resources allow for non-commercial use for educational purposes. As well, the resources can be distributed for free, modified and repurposed at schools. This fully complies with OER principles and the Creative

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16 <http://fcior.edu.ru/>

Commons Attribution-NonCommercial-ShareAlike licence (CC BY-NC-SA) and makes the resources an equivalent to OER in the proper sense of the term.

## Promoting the Use of OER by Teachers and Students

MES policy for the promotion of the use of electronic resources at schools is implemented through both the support to the projects aimed at production of resources and the establishment of portals as gateways to the resources. Much attention is also being paid to the introduction of new technologies and teaching and learning methods in the educational community. This is done through official presentations of the projects, distribution of information materials among schools, organisation of conferences and competitions focused on application of digital resources by teachers and students, development and testing of pedagogical techniques for the use of resources, and professional development of teachers.

Several examples of initiatives aimed at promotion of the use of electronic resources by teachers and students are worth mentioning.

- From 2006 to 2008, when schools were massively connected to the Internet and the first portals containing electronic resources for schools were launched, MES commissioned a five-volume publication *Internet Resources for Secondary Education* to inventory Internet resources and guidelines for teachers and school principals.
- MES annually organises the Information Technologies in Education Congress of six to seven conferences<sup>17</sup> in different cities of Russia, with a final conference held in Moscow. Digital educational resources are one of the topics of the conferences. The site of the Congress hosts the archive of the proceedings of the conferences.
- Since 2008, competitions<sup>18</sup> aimed at promoting the use of digital resources in schools have been annually organised under the aegis of MES. Teachers and school counsellors from different regions of Russia present their developments: digital resources, lesson plans, and case studies of OER implementation. In some regions of Russia, local education authorities organise similar competitions for the teachers of the region.
- MES initiated a number of projects to study the pedagogical aspects of the use of digital resources and the design of teacher development programmes. The projects were completed by the Academy for Teacher Training and Professional Development<sup>19</sup> and the Federal Institute for Education Development.<sup>20</sup> The results of the studies are used in many regional institutes of in-service teacher training.
- Collections of electronic resources, including those developed by teachers of this region, and methodological publications are maintained on regional educational websites. Some examples of the websites hosting regional collections are Novosibirsk Open Educational Network, the Educational

17 <http://ito.edu.ru/>

18 <http://fb.ito.edu.ru/>

19 <http://www.apkpro.ru/>

20 <http://www.firo.ru/>

Portal of the Republic of Karelia,<sup>21</sup> and the Educational Portal of the Republic of Tatarstan.<sup>22</sup>

- A new large-scale regional OER-project is the Moscow Media Centre for Educational Resources,<sup>23</sup> which includes materials for preschool, primary, secondary and additional education. The repository contains updated versions of the resources from the federal FCIER collection and new online resources. Most resources can be used on computers running Windows and Linux, as well as on Android tablets. The project is commissioned by the Department of Education of the City of Moscow and is funded from the municipal budget. All materials in the repository are designed for free non-commercial use.
- The online social network communities of teachers support the use of electronic educational resources, the development of new methods of teaching, and the exchange of advanced experiences and ideas within professional communities (Kulagin, Yastrebtseva, Oboliaeva, & Kuznetsov, 2009). The Open Class: Network of Educational Communities<sup>24</sup> is considered to be one of the most influential projects. It was initiated in 2008 by MES to improve the quality of teaching through the establishment of social online communities of educators. The project is implemented by the National Training Foundation.

The communities of teachers were designed to support the integration of ICT in schools, the professional development of teachers, wider use of digital educational resources, and introduction of innovative didactic methods for using them. Registered users can design personal pages and publish educational resources, guidance papers and other materials. They can also take part in the discussion of the materials, establish communities and participate in master classes and online conferences.

The total number of registered users of the Open Class exceeds half a million; the number of daily unique visitors ranges from 50,000 to 70,000. The portal hosts more than 3,000 communities and discussion forums, including those devoted to the use of digital resources for teaching different disciplines. The number of members of the communities varies from several thousand for multidisciplinary communities to several dozen in specialised communities. The repository of resources set up by users includes over 40,000 materials.

There is an option to search by subject, class and region. Resources published by users vary in their quality, content and the form of presentation of materials, which is an inevitable consequence of the way used to compile the repository: the majority of teachers upload their materials without any moderation or evaluation. The resources are text documents, lessons with graphics, tests, animations, computer software and videos. Although the level of their complexity is not as high as that of resources produced by teams with IT staff for the ICDER and FCIER portals, the Open Class resource

21 [http://edu.karelia.ru/portal/page/portal/edu\\_0/main](http://edu.karelia.ru/portal/page/portal/edu_0/main)

22 <http://www.edurt.ru/>

23 <http://store.temocenter.ru/>

24 <http://www.openclass.ru/>

can easily be modified and repurposed by other teachers for their purposes, using software and authoring tools available at schools.

- There are many other Russian-speaking communities of teachers. The number of participants of these communities and the number of materials in their repositories are lower than those of the *Open Class*. Network teacher communities provide information on the use of digital educational resources at schools, best practices and challenges, applicability of formats, and advice for their application in the everyday activity of teachers

## **New Trends: Open Education and Open Online Courses**

The first Russian project designed for open, tuition-free, massive online education — the National Open University INTUIT (the INTeRnet University of Information Technology<sup>25</sup>) — was developed long before the emergence of the first MOOC initiatives.

The first courses were launched in 2003. In 2012, the project concept was upgraded to add a communicative component allowing for interaction between teachers and students through social networking. In 2015, INTUIT is offering more than 700 courses in the following subjects: Computer Science and Information Technology, Telecommunications and Networking, Mathematics and Physics, and Economics and Management. Course materials are in the format of electronic textbooks or video lectures. Students are expected to pass intermediary tests after studying each module and take a final test at the end of the course, and then they can obtain a certificate. INTUIT courses are integrated into the educational process at many HEIs in Russia and the Commonwealth of Independent States (CIS). Since 2003, the highest number of students who successfully completed one course exceeded 150,000, while the number of registered students was several times higher. The project is financed by the funds obtained by INTUIT as a private higher professional education institution through the provision of fee-based educational services. Other funding comes from advertisements on the project website, publishing activities, and sponsorship by IT companies.

Distance education in Russia has been growing since the 1990s; eLearning has been actively evolving in Russia's HEIs since the mid-2000s. However, in most cases, only students registered at a given HEI have access to that institution's learning materials, although in some cases access to a limited number of materials is open to a wider public to demonstrate the level and potential of HEI and attract new students. A new impetus to the development and running of online courses was provided by the federal law on Education in the Russian Federation, as it recognises eLearning and distance education as an equivalent form of education delivery. MES established a working group for the purpose of assessing the current state of eLearning and online education in Russia and developing recommendations for further expansion of online training.

Like many universities worldwide, during the last few years, Russia's HEIs have been opening up access to their learning materials using MOOCs. To launch their MOOCs, Russia's HEIs use various approaches and platforms (Knyazeva, 2014). Three Russian universities made their courses available on Coursera: State Research

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25 <http://www.intuit.ru/>

University – Higher School of Economics (Higher School of Economics); Moscow Institute of Physics and Technology (MIPT); and St. Petersburg State University.

Joint efforts to promote the Open edX platform and its use in Russia<sup>26</sup> have been undertaken within the interuniversity project initiated by Ural Federal University (UrFU), St. Petersburg National Research University of Information Technologies, Mechanics and Optics (ITMO University), MIPT, and HSE.

Moscow State University (MSU) within the University without Borders project<sup>27</sup> has opened access to more than 10 courses. These are imbedded in the MSU distance learning system and include video lectures, tests and discussion groups.

Designed as a network platform for online business education, Uniweb<sup>28</sup> offers more than 40 courses developed by 10 HEIs. Uniweb was intended to be a commercial project, thus most of its courses are offered for a fee, but some of them have tuition-free mini-versions.

Open online courses have become a new trend in the popular educational project Lektorium<sup>29</sup> which, since 2010, has compiled a multimedia library collection of video lectures of researchers and university professors covering all fields of knowledge (over 4,000 podcasts — the largest in Russia). In addition, the first four MOOCs were launched by Lektorium in 2014; 10 courses are accessible now. Some of the courses have been produced by the multimedia studio of the project; the others were produced by HEIs and uploaded to the Lektorium platform. All resources can be accessed for free. The sources of funding are grants and sponsors.

The non-commercial project Stepic<sup>30</sup> initiated by a group of enthusiasts is aimed at the development of an original platform for online education and authoring tools for the production of online courses. Educational institutions and individual authors may upload their courses and resources and produce materials for further use at other sites. There are about 20 courses and a large open collection of resources. An important feature of this project is licensing of all courses and materials for free use under the terms of Creative Commons Attribution-ShareAlike licence (CC BY-SA 4.0).

The largest and most dynamically developed MOOC project is Universarium.<sup>31</sup> It was launched in early 2014 and, by April 2015 the number of courses reached 60 and the number of registered users exceeded 300,000. Universarium is an open online interuniversity consortium. At the early stages of the project, the core courses were those offered by the professors of Moscow State University. It currently hosts courses of more than 20 universities. The courses cover a very wide scope of disciplines (e.g., Physics, Cybernetics, Electronics, Management, History, Arts and Culture). The target audiences of the courses are HEI students, secondary school students, and the general public. A typical course consists of 5–10 modules, and each includes a series of podcasts, a home assignment and a test. One of the distinctive features of Universarium is a system of cross-checking of home assignments that suggests assessment by students. The number of students for the majority of courses varies from 2,000 to 5,000. Up to 12,000–14,000 students are

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26 <http://edxget.ru/>

27 <http://distant.msu.ru/>

28 <http://uniweb.ru/>

29 <https://www.lektorium.tv/>

30 <https://stepic.org/>

31 <http://universarium.org/>

registered for the most popular courses. A course is repeated when the number of registered students exceeds 3,000. The project is supported by public funds.

In late 2014, the Council for Open Online Education was established in the Russian Federation. Its members are representatives of MES and eight HEIs that are the most advanced in the development and delivery of open online courses. The council is intended to prepare the legislative basis for online education, develop the requirements for courses, and support the quality assurance and coordination/interaction of HEIs.

In late March 2015, eight Russian universities producing open online courses joined to set up the Association of Russian National Platform of Open Education. The main objective is the development and joint use of the system for the production of courses in MOOC format and delivery of education using this approach. As a core system, they chose the Open edX platform, which will be used to integrate the technological developments of universities (members of the association). In 2015, each university plans to launch at least 10 courses. The online courses will not only be used as additional content for self-learning by students, but will also be included in the curriculum, which will make it possible for students from one university to follow online courses provided by other universities and have the course credits recognised by their universities.

The development of these projects is aimed at promoting open online education and the active participation of Russia's HEIs in these projects, as well as supporting the production of new courses and increasing the number of registered students. By offering open courses, HEIs can improve their ranking in the Russian-language educational space, enhance their status quo and competitiveness, and demonstrate a high level of teaching and educational programmes. As a result, the HEIs can attract talented, well-prepared and motivated students from Russia and abroad to enrol in their Bachelor and Master degree programmes.

## **Conclusions**

Support for the production of electronic resources and the provision of open access to them are major priorities of the policy of MES in the field of ICT. A key role in the development of educational content in the Russian-language Internet is played by the system of national portals established at the request of MES and supported by public funding. Major portal initiatives aimed at the integration of electronic resources and provision of open access are the SEW, ICDER and FCIER portals.

For higher education, this approach supports the integration of resources at the SEW portal. This task is implemented through both cataloguing the resources that are available in open access at various websites and uploading the materials to the digital library of the portal. Thus, the project did not provide funding for the production of educational content, but facilitated access to the resources voluntarily submitted to the portal by their producers (without requesting any fee) and encouraged publishing online for free use for educational purposes. The most important result of the project has been more intense use of tens of thousands of learning materials, which were previously used only within the university that produced them and had low visibility on the Web. Students of all HEIs benefit from the opportunity of free access to various learning materials and

now can select the most relevant ones. The teachers now use the materials of their colleagues from other HEIs more often, share their methodological approaches, establish new professional contacts, and use the materials published on the portal as learning materials recommended to students (Abramov et al., 2011).

In the majority of countries, OER initiatives are implemented at the level of higher education by consortia of HEIs or individual universities (Butcher, 2011). A distinctive feature of the Russian OER context is that MES invested heavily in large-scale projects aimed at the production of OER and the establishment of repositories of open digital resources for secondary schools.

The purpose and content of electronic resources for secondary education differ considerably from those developed for higher education. Often the resources created at universities are digital versions of traditional learning materials that also exist in printed form. At the primary/secondary school level, the situation is radically different. The main mission of ICTs and electronic resources in schools is to change the character of the educational process and improve its effectiveness, both in terms of in-class teaching techniques and self-study of students. Digitisation of text and graphic materials is not enough to achieve these goals. The development of electronic resources that contain multimedia components and are interactive is put to the forefront. However, high-quality interactive and multimedia resources can only be produced by professional teams that engage both teachers and IT staff. The initiatives of MES in the promotion of digital resources for school education include developing the resources and ensuring open access to them.

The ICDER and FCIER portals, which enable open access to a large quantity of digital resources for secondary education, were commissioned by MES and funded from the public budget. Most of the content on the FCIER portal is in the form of interactive multimedia learning modules developed using a consistent technological approach and published under terms of use that are equivalent to open licences. Implementation of these projects has considerably enhanced the use of digital resources in Russia's schools and has made high-quality learning materials freely available for all disciplines. The wide scope of the offered resources and their openness allowed teachers to select the most relevant resources and then localise and repurpose them for classroom activities or independent learning of students. The set of measures initiated by MES to promote the use of digital resources at schools resulted in wider use of the results developed within the initiatives. The efficiency of use of computers, interactive whiteboards and Internet access at schools has enhanced traditional didactic approaches — in particular, the “flipped classroom” approach, which is now more widely used in Russia.

Social networking has been successfully used to support the interaction between teachers, school counsellors and course developers, adapting and sharing resources. The exchange of experience on the use of digital resources for teaching has become possible through the establishment of open repositories of instructor's manuals involving tens of thousands of teachers in the Open Class project and other online teacher communities.

A series of new MOOC projects has been initiated since 2014 in Russia. Dozens of open online courses oriented towards different categories of learners have been developed. These new initiatives are independent of the national portals,



even though the portals contain numerous resources that could be of use for the development of online courses. This would be legitimate in terms of author rights if the resources published at the portals would completely comply with the definition of OER and be published under Creative Commons BY-SA licences. However, the terms of use of many resources do not contain an explicit statement on the conditions and acceptable ways of using the resources or, in particular, the permission for repurposing and integrating them into online courses.

The amendments to the Russian legislation related to the intellectual property rights in force since 2014 made open licences legally valid, which enables open licensing of the content of the national portals. Considerable efforts would be needed to receive the permission of authors and right holders. However, doing so would enable wider opportunities for the use of the resources, especially for legitimate use as parts of the online courses for open education and corporate eLearning systems at HEIs.

Given the successful experience of open access provision to educational resources through national portals, the legislative guaranties for the use of open licences in Russia, and the emergence of new resources licensed under Creative Commons Attribution (CC BY), further development of OER initiatives in Russia has great potential.

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CHAPTER  
14

## Open Educational Resources for Early Literacy in Africa: The Role of the African Storybook Initiative

*Tessa Welch and Jennifer Glennie*

### Abstract

There is a drastic shortage of local language, contextually appropriate materials for African children learning to read. This is a major reason for the low levels of literacy of all but the top 10–25% of Africa’s children. To contribute to addressing this challenge, the African Storybook initiative is testing an alternative publishing model. The African Storybook website provides not only openly licensed stories for use, but also tools for the translation of stories and tools for the creation of stories, which are in turn openly licensed. Piloting in Kenya, South Africa, Lesotho and Uganda, the initiative is tackling challenges not only of Internet connectivity, access to electricity, and lack of information and communication technology (ICT) skills in the target audience, but also variable levels of preparedness to embrace the concept of Open Educational Resources (OER). However, there is evidence that “going the open way” can produce the quantity of stories in the languages needed for young children to practise and learn to love reading. In addition, the digital open licence publishing approach of the African Storybook initiative both requires and stimulates teacher and community agency. This is a critical component of sustainable literacy development in under-resourced contexts.

### Rationale for the Initiative

Children need to have lots of practice in reading text, so that decoding letters and sounds on a page can become as automatic as driving a car — freeing up children’s minds for the more complex tasks of comprehension (Abadzi, 2008). They need to have books in a familiar language, with stories that reflect their context and experience, as well as their hopes for the future, so that they can connect with them emotionally (Bloch, 2006). Finally, children need adults who are invested in these stories, motivated to use them, and talk about them and through them to

their children (Bloch, 2006). Ideally, children need to have books from very early in life, well before they go to school (O'Carroll, 2011).

But there is a challenge. There are not enough books in African languages for effective early literacy development (Edwards & Ngwaru, 2011; Pretorius & Mampuru, 2007). Shortage of books means that too few African children learn to read well or enjoy it. This in turn means that there is such a small market for books in African languages that it is not cost-effective to produce these books. As a result, few children learn to read well, and the cycle continues.

There is clearly a need for an alternative publishing model that does not have to consider the size and buying power of the market or distribution networks when producing books for African children in a familiar language.

The African Storybook initiative has responded to this challenge and is testing an alternative way of using information and communication technologies (ICTs) and the concept of Open Educational Resources (OER) to produce and deliver stories for early reading in languages familiar to African children. Its website provides not only openly licensed stories for use, but also the tools for the translation and the creation of stories that are in turn openly licensed. This means that users of the website, wherever they are, can produce the quantity of good reading materials that young children and all first readers need to build up the fluency, neuro and cognitive skills scientists tell us are essential to wiring the brain for reading and complex logical thinking (Hruby, Goswami, Frederiksen, & Perfetti, 2011; Wolf, 2007). The African Storybook initiative does not provide graded readers or a systematic reading scheme, but rather storybooks that are essential supplements to such schemes, encouraging reading for enjoyment as well as practice.

## Context

With generous funding from Comic Relief, a British charity, the African Storybook ICT-based OER initiative is being piloted in three countries. Fourteen pilot sites<sup>1</sup> have been carefully chosen to represent the target audience: the marginalised majority of African children who are not achieving levels of literacy they need to thrive and contribute in contemporary society. The pilots are located in rural and peri-urban primary schools, community libraries and early childhood development (ECD) centres in Uganda, Kenya and South Africa and in the mountains of Lesotho.<sup>2</sup>

## Educational Challenges Pertinent to the Initiative

The major educational challenge in each of the three countries pertinent to the African Storybook initiative is that, despite increased access to schooling, not enough children are literate (or numerate) by the time they leave primary school. This is partly a result of the fact that too few children have the advantage of structured ECD to prepare them for formal literacy and numeracy learning in

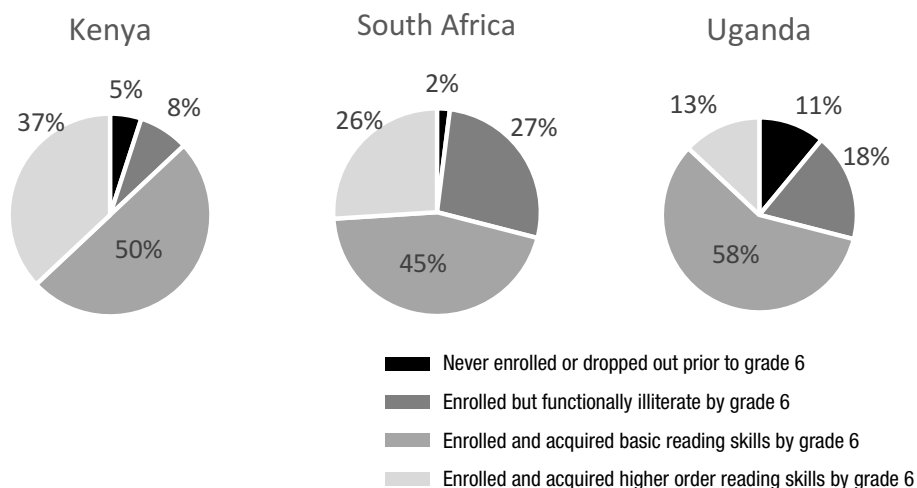
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1 Kenya: Lolupe Primary School, Turkana; Munanga Primary School, Kakamega; Oloosirkon Primary School, Ongata Rongai; Uganda: Arua Core Primary Teachers' College and Arua Hill Primary School in West Nile; Busolwe Public Library with two schools and an ECD centre in Eastern Uganda; and Kabbubu Development Centre in Kampala; South Africa: Family Literacy Project in the Drakensberg; three primary schools in Atteridgeville, Pretoria; Paleng children's library in Lesotho.

2 Only one site in Lesotho, hence this country is not regarded as a pilot country.

school. But it is largely a result of poor methods of and the shortage of resources for teaching reading.

Figure 14.1, from the *SACMEQ at a Glance* series of the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ), shows the literacy levels for each of the pilot countries at Grade 6 (Spaull, 2012a).



**Figure 14.1: SACMEQ III (2007) literacy results in the three pilot countries of the African Storybook initiative.**

In even the best-performing country (Kenya), 13% of children are functionally illiterate,<sup>3</sup> and 50% have acquired only basic reading skills.<sup>4</sup> In South Africa, 29% are functionally illiterate and 45% have basic reading skills. In Uganda, 29% are functionally illiterate and 58% have basic reading skills. In South Africa, only about one-quarter of all children reach higher reading levels; in Uganda this figure is 13%.

Furthermore, while the wealthiest 10–25% of children in African countries achieve standards of literacy that are internationally comparable, the poorest 75–90% (a marginalised majority) do not achieve literacy levels that will enable participation in a globalising society. This inequality is particularly noticeable in South Africa where the poorest 25%, the second poorest 25% and the second richest 25% all have a modal reading score just above 400, whereas the richest 25% have a modal score around 650.

Many experts now believe that this challenge will never be successfully addressed unless there are strenuous efforts to enable children to achieve literacy in their own languages. As Suzanne Romaine (2013, p. 17) points out:

“Linguists must add their voices to this rising tide of criticism of educational policies that remain out of synchrony with multilingual realities. Development cannot reach the most marginalized without speaking to them in their own languages.”

3 If students are functionally illiterate, they cannot read a short and simple text and extract meaning.

4 Basic reading skills include the ability to read for meaning and interpret what is read, and do not include the skills of inferential, analytical or critical reading (see “Often Used Variables on the SACMEQ Database” at [catalog.ihsn.org/index.php/catalog/4526/download/57869](http://catalog.ihsn.org/index.php/catalog/4526/download/57869)).

Research is overwhelmingly in favour of mother tongue literacy, but the implementation of language in education policies that facilitate literacy in the child's main home language or even in a familiar local language is difficult.

Each of the three countries has policies that support mother tongue literacy for the first three grades of primary school, with early transition to English, yet each of the three countries struggles with the implementation of this policy in similar ways (Saide, 2013). There is a shortage of material to support African language literacy (Bloch, 2006) as well as inadequate teacher training for the teaching of reading, particularly in the African languages (Akyeampong, Pryor, Westbrook, & Lussier, 2011; Janks, 2011). This usually results in rote reading: children learning the few books they have by rote, rather than learning to read new books for meaning. In all three of the countries, but particularly in Kenya, there are problems with the status of African languages in the face of English being the language of wider communication (Saide, 2013). This manifests itself in burgeoning private ECD and school provision advertising English medium as a key selling point.

### **Challenges with ICT and Electricity Supply**

The pilot countries differ in infrastructure for the use of ICTs in schools, in the number and range of ICT in education initiatives, and in the levels of skill in the use of ICTs.

Both Kenya and South Africa have a national ICT strategy for schools/education and training, and also have numerous systemic initiatives. However, generally these reach only the socio-economically privileged. The International Telecommunications Union (2013) reports the ratings of various African countries in terms of the ICT development index (IDI), which is a composite index that combines access, use and skill in the use of ICT.

South Africa has an IDI value of about 4.5, with Kenya at about 2.8 and Uganda at about 2. The average IDI score for Africa as a whole is about 2.2, which compares very unfavourably with the world average of 4.8 and even with the developing country average of 3.8 (ITU, 2013, p. 57). This ranking masks the fact that on the sub-index of access, Kenya is ahead of South Africa: Kenya has the largest amount of international Internet bandwidth per Internet user in Africa.

However, Internet connectivity is not the only challenge. According to World Bank figures for 2010–2014,<sup>5</sup> about 82.7% of the South African population has access to electricity compared with only 23% of the Kenyan population and 14.6% of the Ugandan population.

### **Readiness for OER in the African Storybook Pilot Countries**

Conventional publishers in each of the countries are typically not open to releasing their materials under a Creative Commons licence. The reasons vary. Some publishers want to retain control of the versions of the material originally published by them (Cambridge University Press<sup>6</sup>); some are concerned that sharing will impact the competitive edge that comes from the sale of their self-contained literacy development package (the Vula Bula series of the Molteno

5 <http://data.worldbank.org/indicator/EG.ELC.ACCS.ZS>

6 Personal communication with Niall McNulty on 26 January 2015.



Institute for Language and Literacy); still others simply want to adhere to the royalty-based business model because that is what has worked in the past.

Nevertheless, there are also some signs of change amongst publishers. World Reader reports<sup>7</sup> that publishers are often prepared to allow users to read material on mobiles for free, but require them to pay for reading on an e-reader. This enables schools to pay for some titles, and pupils to access further titles on their phones at home. The African Storybook has encountered three responses:

- a request for a Non-Commercial Creative Commons Attribution-NonCommercial licence (CC BY-NC) so that others cannot make money out of funded materials (e.g., Project for an Alternative Education in South Africa [PRAESA]);
- a preparedness to let one or two of many titles be re-published openly — as an experiment (see, for example, the READ organisation in South Africa); and
- a willingness to donate illustrated stories as part of corporate social investment (see Lapa publishers in South Africa<sup>8</sup>).

In respect of learning and teaching support material for schools, in each of the countries, there is a curriculum unit within the Department of Education (as in South Africa) or an autonomous body responsible for evaluating and approving materials for distribution in schools (as in Kenya and Uganda). The approved materials appear on official lists, and schools are not allowed to order material not on the list. However, there is greater latitude with stories than there is with textbooks.

When it comes to digital and openly licensed material, the countries vary. Kenya's eLearning unit within the Kenyan Institute for Curriculum Development is beginning to grapple with digital materials provision. In South Africa, openly licensed secondary Mathematics and Science textbooks produced by Siyavula<sup>9</sup> made it onto the list of approved texts. However, the method of selection of the approved texts does not exploit the “sea-change” (Attwell, 2012) presented by open licensing — that is, the shift from paying for content to paying for the services around content (such as printing and distribution) or customising for different types of learners or schools or languages.

Each of the three countries has major national or provincial programmes to support literacy and numeracy development in the early grades. These programmes provide materials as well as teacher training to support initial reading in the mother tongue/home language. It is recognised, however, that graded readers are not enough; there have to be storybooks as well — supplementary readers that encourage reading for pleasure and practice. The shortage of such supplementary readers in African languages is a challenge in each country that affects reading achievement.

This point was powerfully made in a recent presentation of the interim results of the RTI School Health and Reading Programme (Basic Education Working Group meeting in Kampala on 8 April 2015). Children learning to read in a language like Luganda, in which there are some local language stories and resource materials, do much better than those learning to read in languages like Ateso, in which there

7 Personal communication with Alexander Poltzin on 31 January 2015.

8 Personal communication with the Manager for Children and Youth Publishing, 15 April 2015.

9 <http://www.siyavula.com/>

are no local language stories or resources in schools. Whereas 9% of Luganda-speaking Primary 2 grade children can read 20 or more words per minute, none of the Ateso-speaking Primary 2 grade children can. Even with an excellent reading intervention such as the School Health and Reading Programme, only 2.8% of Ateso-speaking children reach the target for Primary 2, whereas 18% of Luganda-speaking students reach this target (USAID, 2014). The need for supplementary local language resources is clear.

## **Model for Development and Implementation of the African Storybook Initiative**

The African Storybook initiative is not working directly on OER or ICT policy. Rather, it is implementing an ICT-based OER initiative to address an identified and essential challenge (shortage of local language materials for early reading) that other agencies involved in supporting the education systems in African countries cannot or are not addressing:

- First, the African Storybook initiative is not itself spearheading large-scale literacy development in the pilot countries. Rather it is positioned as a necessary partner to government departments and other large-scale literacy development projects, supplying openly licensed multilingual materials that can be customised and printed for distribution in schools.
- Second, in the pilot sites with pupils who represent the target audience, the African Storybook initiative is testing the website stories and tools, as well as methods of delivery that span digital (online as well as offline) and print. Lessons of experience with regard to access and use are recorded and acted on wherever possible.
- Third, the initiative is working to integrate use of the website and stories in pre- and in-service teacher education programmes. Working with teacher educators has a multiplier effect, as generations of trainee teachers and their pupils pass through their hands.
- Fourth, through a wide network of partners, both in the pilot countries and in other African countries (or international organisations that are supporting them), the initiative is hoping to stimulate expansion to further languages and contexts, without relying on the small team located in Johannesburg to manage the effort. This will be key to the long-term sustainability of the initiative.

In all these ways, the initiative plans to influence practice, giving rise to new ways of working that will, in due course, influence policy and practice.

### **Evidence from Implementation**

The African Storybook initiative embarked on several partnerships with teacher education institutions in 2015, so it is still too early to discuss in detail evidence from implementation of these initiatives. Therefore, evidence from implementation is discussed below as responses to a series of questions:

1. Is it possible to create and translate the stories needed, in the quantities needed, at minimal cost? What role does the licensing of the stories play in this?
2. Are users from the target audience (district officials, literacy development organisations, and teachers and librarians serving rural and peri-urban African communities) able to access and use the website?
3. Are the stories being used productively to support literacy development?
4. Do large-scale national programmes see the benefits of using openly licensed materials? Are they prepared to engage in translation and adaptation prior to publishing?
5. Do large-scale national programmes see the benefits of using openly licensed materials? Are they prepared to engage in translation and adaptation prior to publishing?

**Is it possible to create and translate the stories needed, in the quantities needed, at minimal cost? What role does the licensing of the stories play in this?**

Development of the African Storybook website and collection of stories started in 2013. The website was launched in June 2014 with 120 stories and over 600 translations of these stories into 19 languages.

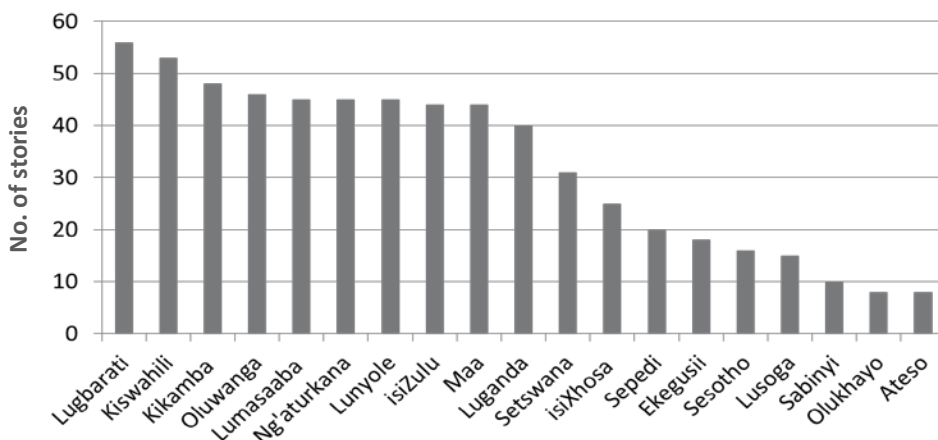
The African Storybook initiative has demonstrated that it is possible, in a relatively short time, to obtain, edit, publish and translate a critical mass of stories for early reading in the languages spoken by people in its pilot sites.

A critical mass for the first year of piloting was understood to be between 40 and 50 stories in the African language (or languages) spoken in the pilot site, and a selection of 70 more for the sites themselves to translate or “version” from English. In a remote place like Turkana in North Western Kenya, virtually the only stories in Ng’aturkana are Bible stories. So, a collection of 45 Ng’aturkana stories is 40 times larger than what previously existed.

The provision of between 40 and 50 stories in each of 10 main languages in the three countries would not have been possible without two things: collecting existing openly licensed stories, or receiving donations of stories that people were willing to have re-published under an open licence; and being able to source not only stories but also translators from the communities around the pilot sites.

Stories have come from: donations of illustrated or un-illustrated stories from authors and emerging authors in the pilot countries; story development processes at universities and in partner literacy projects; and openly licensed stories or folk tales from the Internet. Most authors are very willing to give their stories. To start the website with a critical mass of stories in the languages of the pilot sites, translations were commissioned from local language experts. As the website matures, pilot and other partners are voluntarily translating and adapting because they need the stories in a particular language. Translations are also being obtained from volunteer translators who work under “Translators without Borders.”

While the majority of original stories were donated in English, a sizable donation of 22 stories in isiZulu<sup>10</sup> was also received. Because the stories were published under a Creative Commons licence, it was possible for the quantity of stories in African languages to be radically increased, as Figure 14.2 illustrates.



**Figure 14.2: Number of stories in African languages in June 2014.**

Translation is a powerful way to increase the number of stories in African languages, but it is difficult to create African language translations that are culturally and linguistically alive when the original story is in a language that is so different in history and structure. Hence, the effort after the launch of the website was to obtain as many stories as possible originally written in an African language. Whereas in June 2014, 66% of the stories on the website were originally in English, only 20% of those published in the next six months were originally in English.

Table 14.1 shows that the number of unique stories tripled in just over a year, and there was a steady increase in the number of translations and the number of languages.

**Table 14.1: Growth in African Storybook stories, translations and languages**

	No. unique stories	No. translations and adaptations	No. languages
3 June 2014	120	617	20
31 Jan 2015	300	1,005	30
28 Feb 2015	317	1,023	42
31 March 2015	348	1,038	42
30 April 2015	373	1,129	52
31 May 2015	389	1,297	52
30 June 2015	404	1,426	53

<sup>10</sup> We acknowledge, with thanks, the Centre for Adult Education at the University of Kwazulu-Natal for the 22 donated isiZulu books, the SEED series (<http://cae.ukzn.ac.za/Resources/SeedBooks.aspx>).

The fact that the stories are openly licensed is key to the rapid growth of the website. As permissions editors know, obtaining the necessary clearances for materials is a process that can take six months to a year. If this had been necessary for each of the stories and their translations, it would not have been possible to publish a collection of this size in two years.

Cost is another consideration. Once the African Storybook platform was established, collecting existing stories and receiving donated stories has incurred minimal costs. However, there are costs associated with editing or re-shaping the stories, procuring illustrations as necessary, uploading to the website and providing the necessary metadata. A recent costing has demonstrated an average cost of USD 1,450 per story for a story that is available to thousands to read.

Each story can then be translated into multiple languages. This can be done by committed individuals for no cost. In addition, workshops with local language speakers have proved very effective. A recent example of a translation workshop of 24 participants over two days produced 65 versions of seven existing stories, with translations across eight languages and adapted across three different levels. The exercise has been costed to include workshop costs (travel, per diems, teas and lunches, and a facilitator), a separate quality assurance workshop, and the preparation of the stories and their metadata for uploading. The cost to upload a quality-assured local language translation or adaptation of a previously illustrated African Storybook story is USD 170 per version.

Such a story is then freely available to view or to download or print. Current examples of printing modest runs of 1,000 copies of the books with colour covers and black-and-white pages come in at between US 60 cents and USD 1 per copy.

The initiative is thus demonstrating that it is possible — through sourcing and re-publishing donated and existing openly licensed stories, and stimulating story creation, translation and adaptation by ordinary people — to produce a surprisingly large number of stories and translations of stories in a relatively short time. Once the website is firmly established, the cost of creating new stories, translating, versioning and printing them is minimal.

**Are users from the target audience (district officials, literacy development organisations, teachers and librarians serving rural and peri-urban African communities) able to access and use the website?**

A frequent criticism levelled at those involved with OER is that enormous effort is spent on creating OER, but the resources are barely used. This is especially the case if the target audience is not accustomed to using the Internet or there are challenges with the necessary infrastructure.

In the pilot sites, the African Storybook initiative is testing what equipment and support are necessary to facilitate access and use among the most under-resourced part of the target audience. To this end, the pilot sites were supplied with devices and a small subsidy. They were not provided with a comprehensive ICT solution like other ICT in education initiatives.<sup>11</sup> They received a small suitcase containing

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<sup>11</sup> For example, iMlango in Kenya (supplying Internet access, an Internet portal, and e-readers to 195 schools), or South Africa's Cofimvaba Schools District Technology Project, which set up the necessary infrastructure for the entire district before introducing tablets for teaching and learning in Eastern Cape rural schools.

a laptop, portable or standard projector (depending on whether the site had electricity), and a 3 G modem or Wi-Fi router, and memory sticks.

There are two main methods of delivery: the story downloaded and stored on the computer for offline projection in a classroom setting — a “big book” on a classroom wall; and low-cost photocopied booklets for children to use in class or at home. We explore these two methods below.

**Digital projection** – Digital projection requires a laptop or tablet connected to a digital projector. In situations where there was no power supply in the classroom, a battery-operated, palm-sized projector was used. If the room was well darkened, the story could be projected on the classroom wall or portable chalkboard covered with white paper.

Where necessary, low-cost solar power kits to facilitate charging of the equipment were also provided. As well, some sites received a camera, video camera or voice recorder to facilitate capturing of local language storytelling.

A striking finding after the first year of piloting is that involvement in the project has stimulated the sites to take independent steps to meet their technology needs. For example, at one of the sites, the solar charger option that we were able to afford was not adequate, so the site manager sourced a better option and a better supplier and paid part of the costs of this better option. Other sites were able to attract donations of laptops and projectors. Also, individuals have been inspired to buy their own equipment. For example, the principal of a primary school associated with a community library pilot site was so inspired by an African Storybook workshop that he purchased his own laptop in order to access and use the site.

However, the level of ICT skill of the target audience is low, even lower than predicted. Although all pilot sites were able to access the website and find stories, most educators at the sites are still developing confidence to create, translate and adapt online. For this reason, while there was considerable download activity in 2014, creation, translation and adaptation took place mostly offline in many of the pilot sites. With regard to use of the devices, the country co-ordinator for Kenya reported that (Mhlanga et al., 2013):

“Six months after the ASP [African Storybook project] had supplied laptops and portable projectors to project sites, some of the sites were still not comfortable with using the equipment, especially the projectors. Instead of projecting stories on a screen for children to read, teachers at one site were getting kids to come and crowd around the one laptop and read stories. At another site, teachers were reading stories aloud from the laptop whilst children listened.”

However, by the beginning of 2015, teachers at the site had grown in confidence and skill, and were quite comfortable even with the projectors.

**Low-cost printed storybooks** – While digital projection is good for whole class reading, many schools are not able to acquire the equipment to make this possible. In addition, children learning to read also need stories in their hands to encourage them to read for themselves.

However, printing out stories from a website in a cost-effective way is challenging. As every printer is different and computers have programmes with different settings, it is impossible to provide a simple set of instructions that will fit every situation. The African Storybook team is therefore supporting pilot sites by printing master copies of stories and putting them in a “flip file” (file with plastic sleeves) so they can be used to create multiple copies of double-sided booklet format stories for the classes. This method of distribution of print copies is also being proposed to the Department of Basic Education in Uganda. They have been alerted to the numbers of stories that can be made available in this way, the increased flexibility in changing or adding to titles in particular languages, and the enormous reduction in distribution costs.

It is also possible to go through a publisher to print multiple copies of the stories (at about USD 1 a copy) or to make a small number of full-colour library editions for ZAR 65 (about USD 7) per double-sided copy on glossy cover stock stitched with a sewing machine! This is what one of the African Storybook partners, Little Zebra books<sup>12</sup> has done with their stories which were published on the African Storybook website.

### **Are the stories being used productively to support literacy development?**

OER need to be available and accessible to the target audience, but they also have to be used productively. Appropriate use of the stories for literacy development so that levels of literacy improve in the society is the ultimate goal of an initiative such as the African Storybook even though the goal will be attained indirectly by other organisations working in literacy development. The initiative is at too early a stage for an impact study, but certain trends have been observed in the way that the stories are being used in the pilot sites.

Pilot sites are using the stories from ECD through to Primary 3 and in library settings with older children. Active engagement with the stories is mentioned in all reports, as is children’s excitement with having the stories digitally available.

An unexpected outcome of pilot site engagement has been an increase in planning and collaboration among the African Storybook educators at a particular site. In one site, for example, teachers meet on Saturday afternoons to plan how to use the stories with the children during the week, and to support each other to access, create and version stories from the website.

In some sites, local language stories are being used for the first time to support the teaching of reading. Educators report that with stories in English, children spell out the words in rote fashion with little or no comprehension, but with stories in the local language, there is emotional and cognitive engagement. In multilingual schools in peri-urban areas, where instruction has to take place in Kiswahili or English, the use of stories in other languages spoken by the children has been highly motivating: their language is recognised, and they are authorities in their own language.

An example of the possibilities for use in teacher education settings is contained in this short vignette of an activity from a workshop at a Primary Teachers’ College in Eastern Uganda.

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12 <http://www.littlezebrabooks.com/diy-library-editions/>

Student teachers were asked to read the level 4 story *Chicken and Millipede*,<sup>13</sup> translate the simple level 1 English version of the story into their languages (Ateso, Lumasaaba, Lugwere, Lusoga, Leblango, Luganda and Lunyole), and then “perform” these translations before the whole group.

When the students were asked to read aloud a page of the English level 4 version of the story, they struggled with some of the English words, such as *grumpy*, *fuss*, *beak*, *swallowed* and *burped*. Clearly, even though the medium of instruction at the College is English, they have some difficulties with English. They also needed considerable prompting to understand stylistic features, such as repetition, sentence patterns, and selection of words to create an effect. But they loved the story — particularly the pictures. Working through the English version in this way was an enjoyable way to work on students’ English.

But the activity did not stop there. After discussing how the story could be adapted for Primary 1 children, the teacher students were then engaged in translating the simple level 1 story into their various languages. The facilitators read the story page by page, and the students wrote each sentence in the new language.

When the translation was complete, 10 of the 250 students read their translations — a different language each time. The other students really enjoyed this — and there were roars of appreciation when a particular student used a clever word or phrase. Clearly the student body is multilingual, and this kind of activity affirmed their multilingualism, as well as their knowledge of their own home language.

In subsequent workshops, the student teachers would discuss how to use stories when they go on teaching practice: how to ask questions that provoke discussion, how to encourage the children themselves to ask questions, how to predict what the story is about from the pictures, how to use the story for the development of vocabulary and understanding of verb tense, and so on.

In this process, the students’ multilingual expertise is affirmed and they are in a position to make a real contribution to the stories on the website. But at the same time their own English skills can be developed, and they have access to many local language resources for teaching reading in their classrooms.

**Do large-scale national programmes see the benefits of using openly licensed materials? Are they prepared to engage in translation and adaptation prior to publishing?**

Individuals or organisations like schools or community libraries can be supported to access and use openly licensed materials, but an initiative such as the African Storybook needs partners sufficiently interested in the resources and tools to integrate them into their large-scale programmes. This is one of the ways in which the initiative could become sustainable.

Although the initiative is still in its early stages, there are indications that the advantage of openly licensed local language materials as supplementary readers is recognised in Kenya and Uganda.

In Kenya, the eLearning division of the Kenyan Institute for Curriculum Development (KICD) is considering a process for systematic review of the stories in the African Storybook collection. The African Storybook initiative has been

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<sup>13</sup> <http://www.africanstorybook.org/stories/chicken-and-millipede>



approached by a major eLearning initiative linked to the Ministry of Education, iMlango, which is providing Internet access and an Internet portal for 195 Kenyan schools (over 150,000 pupils).

In Uganda, large-scale national literacy development programmes — such as the USAID/Uganda School Health and Reading Programme (SHRP) and the Aga Khan Foundation’s Strengthening the Education Systems in East Africa (SESEA) programme — are interested in the potential of the project to provide affordable local language supplementary readers, and are engaging the African Storybook project in the selection and translation of a range of titles.

There have been a number of learnings from the partnership between the SESEA programme run by the Aga Khan Foundation (AKF) and the African Storybook project. SESEA is a five-year project that aims to sustainably improve learning outcomes, with a particular focus on literacy and numeracy, for pre-primary and primary students in selected districts in Kenya, Uganda and Tanzania. In West Nile, Uganda, AKF is working in three districts: Arua, Yumbe and Koboko. The programme equips teachers to teach reading, but key also is the provision of supplementary readers for the libraries and schools. These need to be in the local languages — Kakwa, Lugbarati, and Aringati, not only in English. However, the SESEA staff in West Nile were unable to access readers in these languages.

The African Storybook initiative was able to supply 50 openly licensed stories in Lugbarati and English, from which 10 titles could be selected and translated into the other two languages, uploaded on the African Storybook project website, published, and then downloaded for printing.

In terms of costs, the African Storybook Project provided the content and illustrations in one of the languages free of charge to AKF. However, though content is free to end users such as AKF, the African Storybook has incurred costs in preparing stories for uploading on the website: story editing and, where necessary, commissioning of illustrations as well. The project further incurred costs in working with AKF to get the stories “right” — implementing changes to text and illustrations. AKF paid for the translations into two additional languages, Aringati and Kakwa, but African Storybook checked the translations. Finally, AKF paid USD 1 per book to a publisher for the printing of the titles.

There were a number of learnings from this experience. The first set came from engaging with the feedback from the Ugandan Ministry of Education and Sports (MOES). It was clear that the seven titles were selected primarily because they could be related to the Ugandan curriculum. A great deal of comment was received on the illustrations, particularly those that showed only part of a person or animal instead of the complete person or animal.

The second set of learnings from this engagement is very pertinent to initiatives that attempt to get partners to take advantage of openly licensed material. Usually, ministries of education and teacher training and school improvement programmes rely on publishers to prepare materials according to their specifications. However, a platform offering openly licensed material that can be adapted and translated requires users to assume much more responsibility for editing and publishing. Partners are not necessarily willing or able to take on this responsibility. In the African Storybook project, there was great difficulty getting to an accurate translation of the texts of the two new languages. The

African Storybook publisher (based in South Africa) had to insist that not only the translations but also the subsequent corrections to those translations be typed rather than handwritten. Since she was not working in a familiar language or orthography, she had to cut and paste the correction into the text as she could not interpret handwritten changes. AKF was also reluctant to engage in making the illustration and text changes recommended by the ministry officials; the African Storybook publisher had to provide the necessary publishing services. In other words, although content may be free, publishing services related to that content have to be funded or paid for as well. Many people who need openly licensed material also need publishing services to customise this material.

As has become clear to OER advocates and practitioners, the fact that a resource is openly licensed does not mean that it costs nothing. Each time a resource is re-published, further costs are involved — such as, in this case, adapting the illustrations, extending the number of languages, and printing. These costs are, however, lower than those for conventionally published material: rights for translation into different languages do not have to be purchased; adjustments can be made to digital resources relatively easily; illustrations can be re-used in different versions of the stories; and digital printing from high-resolution PDFs avoids the need for re-design of materials already published on a website.

### **What are the indications of a sustainable future for the initiative beyond the initial four-year funded period?**

In the first instance, sustainability depends on uptake not only of the stories but of the website tools to create new stories or versions of existing ones. Enough progress needs to be demonstrated to secure funding for partnerships in a larger range of countries and/or for wider systemic implementation in an existing country.

Although with support the pilot sites have been able and willing to engage with the website stories and tools, and have demonstrated how the initiative could work in authentic contexts, this does not demonstrate sustainability. It is agencies and individuals who work with the target audience that are most likely to contribute stories and translations in a sustained way. For example, one of our partners, an instructor at the English Language Institute at the University of British Columbia, works with trainee teachers in Mozambique. She has published 11 unique stories with translations into Portuguese and several local Mozambiquan languages that can be used by her students to teach reading. She and another partner, Little Zebra Books, have ensured that, although Mozambique is not a pilot country for the African Storybook initiative, it has a strong presence in the digital library.

A second example is a U.S.-based French-speaking partner working in educational technology for development. Looking for simple-enough reading material for a project in Niger, she came across the African Storybook website. She immediately started translating 17 stories into French, from which they have been versioned into four languages spoken in Niger.

However, while the expansion of the website stories, languages and translations can be achieved in this way, this approach is not a way to attract funds or payment for continued servicing of the website. A more financially sustainable option may be supply of supplementary readers for major national reading improvement programmes. This could be made sustainable through marketing of story

development and publishing services for the customising of openly licensed material for specific countries or curricula.

## Conclusions

The mission of the African Storybook initiative is to develop and refine the tools that make it possible for local schools, projects and community libraries — as well as large-scale national programmes — to write, adapt, translate and print the local language stories they need for their literacy development activities and programmes. There is evidence that “going the open way” can produce the quantity of stories needed, in the languages needed, for young children to practise reading. There is also evidence of both enthusiasm for and use of the website and its stories. Digital access for rural and peri-urban African users is not an insurmountable obstacle, even though the performance of the website for low bandwidth areas is not yet optimal.

The website is being seeded with hundreds (hopefully thousands) of openly licensed stories, from “first word” books to books for reading to children, so that no one has to start from zero. But the ultimate hope is that there is a website so easy to use and requiring such low bandwidth that organisations and programmes working across Africa in a wide variety of languages and educational systems will be able to read, download, print and create the materials they need.

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# Developing an Infrastructure Support for Faculty Use of Open Educational Resources: The Case of the Washington State Community and Technical Colleges System

*Boyoung Chae and Mark Jenkins*

## Abstract

In this chapter, the authors discuss the processes by which the Washington State Community and Technical Colleges (CTC), a system of 34 diverse and independent institutions, have created and supported the widespread adoption of Open Educational Resources (OER) through a strategy that combines policy, professional development, research and instructional innovation.

The authors analyse how the system has used open policy to fund, promote and support the implementation of open projects, how each initiative has been cohesively designed to support the system's mission and planning, and how faculty have understood and collaborated in these efforts.

This systematic, generalised process aligns OER advocacy with the specific goals for access and student success that drive strategic planning in Washington's CTC system. Given a strategic plan that outlines clear action items related to OER, both policy development and adoption constituted a crucial next step in authorising and supporting implementation. Rules derived from the policy support and guide the identification, funding, design and implementation of open initiatives. Finally, a robust research agenda helps the system evaluate the status, knowledge and competency around OER in the CTC and provides important data for future OER decision-making.

## Introduction

In the United States, community and technical colleges serve as an essential entry point to higher education for millions of learners of all kinds (American Association of Community Colleges, 2014). Designed to provide both workforce credentials and two-year Associates degrees for students planning to transfer into four-year colleges and universities, community colleges deliver these credentials at

a lesser cost-per-credential than most four-year institutions. With generally open admissions policies and a mission-driven imperative to provide broad access and inclusiveness, these colleges play a critical role in the U.S. academic infrastructure as a more affordable alternative for economically disadvantaged populations.

Indeed, community colleges are deemed so important to educational and economic mobility in the U.S. that the Obama Administration recently proposed that a community college education should be a right of all citizens free of charge (The White House, 2015). While the fate of that proposal remains undecided and subject to scrutiny and debate, the idea itself suggests the burgeoning importance of the U.S. Community and Technical Colleges System as an essential gateway to skilled, living-wage professions and their accompanying promise of social mobility.

As of 2014, community colleges accounted for 45% of undergraduate enrolments in the U.S. (American Association of Community Colleges, 2015). Furthermore, a 2013 study by the College Board shows that median earnings for full-time workers with an Associate degree were 27% higher than for those with no such credential (College Board, 2013).

However, significant financial barriers to community college attendance remain. Even when adjusted for inflation, the total cost of Associate degrees (including both tuition and fees) has nearly tripled since 1984, and costs continue to increase (College Board, 2014). The de-funding of U.S. public higher education and the consequent upward spiral in tuition and fees is a well-established trend. It is therefore imperative to address affordability through other means if access to high-quality higher education for economically challenged populations is to be maintained.

Recognising this challenge, the Washington State Community and Technical Colleges (CTC) system has applied a system-wide strategy of resource sharing, led by the Washington State Board for Community and Technical Colleges (SBCTC). Washington's CTC system, composed of 34 colleges, prepares nearly 400,000 students each year for careers, to transfer to four-year colleges to attend universities, and to attain enhanced workforce credentials. SBCTC, as a state government agency, supports the goals of the CTC system and provides system-level coherence and policy support to the mission of access and student achievement that drives state-wide goals for higher education. The agency is less a directive body than a facilitative one. The colleges in the system are largely administratively independent and diverse in their organisational cultures.

Of many initiatives emerging from Washington's CTC system's resource-sharing strategy, one of the most significant is disseminating the policy and practices of adapting and using Open Educational Resources (OER). SBCTC's 2007 Strategic Technology Plan codified the principles that have enabled the agency to direct its efforts in important directions related to a culture of open education and the dissemination of OER (SBCTC, 2008). Principle Seven of the plan explicitly states that the CTC system will "cultivate the culture and practice of using and contributing to open educational resources" (p. 7). Further, Strategy One of the plan mandates the assembly of a "system-wide suite of online teaching and learning tools" (p. 21). Included in the actions prescribed in this strategy is the provision of free textbooks: "Whenever possible, eliminate published textbooks

in favour of free, open, online materials” (p. 21). The strategies and actions embodied in the plan set the stage for the creation of a system-wide framework of open policy and practice.

Regarding implementation, in 2010, SBCTC instituted the nation’s first state-wide Open Licensing Policy. This measure explicitly addressed Principle Seven of the Strategic Technology Plan in creating a culture of sharing and creating OER. Further, it would be applied to all SBCTC-sponsored or managed initiatives in order to create momentum and competency around OER throughout the CTC system. This policy is focused strongly on educational access, specifying that “all digital software, educational resources and knowledge produced through competitive grants, offered through or managed by SBCTC, will carry a Creative Commons Attributions license.”

Next, we delve deeper into how this policy has shaped the development of initiatives and research activities, and how these three elements (policy, initiatives, and research) have cohesively supported the effort of faculty in Washington’s CTC system in using OER for their pedagogy.

### Case Analysis

The Washington State CTC support system for faculty’s OER use is made up of three related areas: open research, open policy and open initiatives (Figure 15.1). To start, the data collected and used in state-wide open research drives decision-making when it comes to Washington’s open policy and open initiatives. Open policy further provides the foundation and support of how each initiative should be designed and implemented.

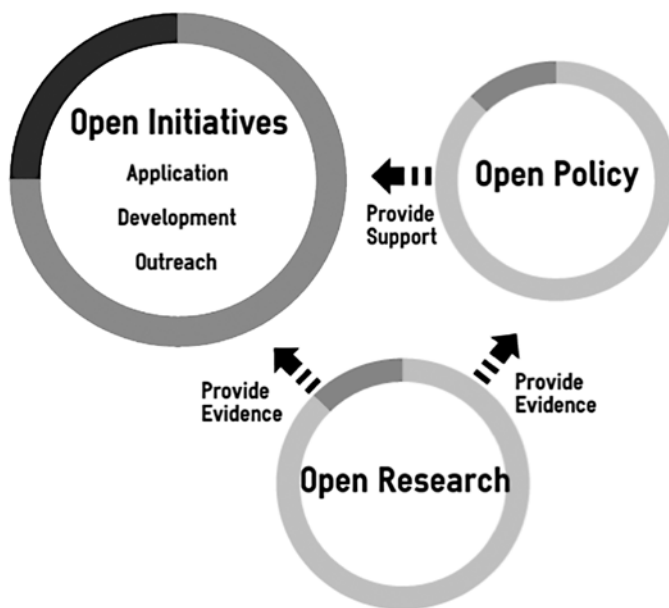


Figure 15.1: An infrastructure support for open research, open policy and open initiatives.

# Open Policy Implementation

## Initial Pilot

The development of the implementation model for the open licensing policy began with a pilot project. SBCTC's intention was to optimise the model for implementation through an ongoing grant project before applying the model agency-wide. eLearning and Open Education, a unit of the Education division at the SBCTC, initiated this effort and developed the first implementation model in 2010. This model included a few simple strategies:

- Each grant project hires open licensing experts and assigns them to each grant cohort.
- Open licensing experts clear the copyright permissions for all materials produced and assume responsibility for releasing the end products under a Creative Commons Attribution licence (CC BY).
- Open licensing experts provide individualised guidance for grantees in finding and adopting OER to produce the end product required of the grant.

This initial implementation plan was applied to a system-wide OER initiative, the Open Course Library (completed in 2013), and critical lessons were drawn from those experiences. First, while open licensing experts (librarians) provided support for the project participants, participants' lack of understanding about the specifics of open licensing created significant difficulty in communication and overall workflow.

We realised that, even with the guidance from the experts, participating grantees themselves need to be sufficiently trained in using and applying the CC BY licences. We also learned that the grantees need a specific OER guide with the licensing statement samples, template, rubric and other relevant information in order to ensure a consistent format and proper licensing. Finally, we recognised the need for communicating about the CC BY licensing requirement before and during the grant application process. These adjustments have helped ensure that potential grant applicants begin their projects with full awareness of the different components of the licensing requirement.

## Development of the Model

Applying the lessons learned from the pilot project, SBCTC revised the Open Licensing Policy implementation model to provide the greater support and education needed (as outlined above) in order to ensure this model could be applied agency-wide without significant disruption of project workflows. In 2014/2015, SBCTC gave out over 120 competitive awards totalling more than USD 17,500,000, and this model has been applied to each of them. The model requires that each unit in the Education division<sup>1</sup> be responsible for releasing work produced from grants that flow through the division under a CC BY licence.

While the SBCTC eLearning and Open Education department provides support (training, consultation and troubleshooting) throughout the entire process, each divisional unit makes the decisions about the terms of use for the resources based

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<sup>1</sup> The Education division in the Washington State Board for Community and Technical Colleges is composed of six sub-units, including Student Services, eLearning & Open Education, Workforce Education, Basic Education for Adults, and Policy Research.



on the unit’s own context and needs. Specifically, the model recommends that all divisional units designate staff to be responsible for the open licensing of grant-funded work.

Table 15.1 outlines the recommended steps each unit should follow in order to release its work under the CC BY licence.

**Table 15.1: Washington’s SBCTC Implementation Guideline for Open Licensing Policy**

Recommended Steps for Designated Staff from Each Ed Division Unit	
Getting Ready	<ol style="list-style-type: none"> <li>1) Review the guideline on the Open Licensing Policy Implementation webpage. Please note that competitive grants refer to the <i>optional</i> grants that colleges elect to apply for such as Job Skills Program grants. This does not apply to formula-based federal grants, such as Basic Education for Adults (BEA), Basic Food, Employment &amp; Training (BFET), Perkins, and WorkFirst.</li> <li>2) Complete “How to Use OER”, a 2-week online training course provided by SBCTC eLearning &amp; Open Education.</li> </ol>
Contracting	<p>Create a license statement and copyright statement and add them to the contracts, grant agreements, and/or Online Grants Management System (OGMS). SBCTC eLearning &amp; Open Education will be happy to assist in drafting the language. For example:</p> <ul style="list-style-type: none"> <li>• I understand that the State Board owns the copyright of any material produced under the terms of this grant.</li> <li>• I understand that any material produced under the terms of this grant must be released under a Creative Commons attribution (CC-BY) license.</li> <li>• I understand that at least one member of the grant project is required to complete “How to Use OER” training provided by SBCTC (or provide evidence that they have already completed it).</li> </ul> <p>Provide a grant guide that includes the information about the CC licensing requirement. Please see an example: ATL Faculty Learning Community Grant Guideline (p. 2).</p>
Training	<ol style="list-style-type: none"> <li>(a) Organize an OER training opportunity for all grantees to help them understand the CC licensing requirement. SBCTC eLearning will be happy to provide a webinar or special training session for each project cohort.</li> </ol>
Sharing	<ol style="list-style-type: none"> <li>(a) Ensure that grantees create the digital artifacts that can be shared. Digital artifacts include curriculum created, a compilation of resources used/discovered/collected over the course of the grant work, webpages, blogs, marketing materials (brochures/posters), research reports written based on the grant work, etc. Digital artifacts do not need to include meeting notes, emails, or other informal materials created/used during the duration of the grant.</li> <li>(b) Store the materials in a place easily accessible to the public.             <ol style="list-style-type: none"> <li>i. For example, SBCTC’s website, or Google Drive</li> </ol> </li> <li>(c) Add the licensing statement in the chosen repository. SBCTC eLearning will be happy to assist in drafting the language.</li> </ol>
Reporting	<ol style="list-style-type: none"> <li>(a) Fill out the online Open Policy Reporting form with the link to the digital artifact and type of license. This information will be published on the Open Policy Implementation page.</li> </ol>

Source: Washington State Board for Community and Technical Colleges (SBCTC), 2008

This model has been successfully applied to several grant projects, such as: the Project I-DEA (a curriculum design project that has developed 34 flipped and blended instructional modules to increase digital, career and college-readiness skills of adult English language learners); the Competency-Based Learning Project (a project to develop a completely online, openly licensed, competency-based business transfer degree); and the Faculty Learning Communities (a professional learning project that funds faculty learning communities). Project managers reported that this implementation model helped the participants properly apply the CC BY licence to their work, significantly increasing the awareness of open licensing and OER in general.

This policy continues to undergo modification. SBCTC considers it to be the start of a more extended open policy that will eventually support not only the SBCTC managed grant works but also resources produced by SBCTC and fellow state government agencies in education.

## Open Initiatives

At the core of the Washington CTC support infrastructure for faculty OER use are the open initiatives that are informed by, and designed based on, data and policy. Washington's open initiatives can be categorised as one of three levels of practice: development, application and outreach.

- **Development level** – Washington's CTC first made a systemic move in OER via the Open Course Library project (OCL) in 2010. OCL is a large-scale curriculum design effort leveraging a variety of existing OER that can be adopted and adapted for free.

This project was initiated to provide an alternative to expensive textbooks that present a significant financial barrier for community college students. According to a national affordability study, 44% of low-income<sup>2</sup> students choose to attend community colleges as their first college, and nearly 70% of these students reported that they chose community colleges for affordability reasons (National Center for Public Policy and Higher Education, 2011). However, while the lower tuition at a community college extends access to a college education for under-served students, these students may face another financial challenge: the cost of textbooks. According to the SBCTC Operating Budget Office, the average tuition and fees for Washington CTC students in one academic year<sup>3</sup> (three quarters) cost USD 4,000 (SBCTC, 2015). The Washington Financial Aid Association (WFAA) estimated that, in 2014/2015, the cost of books and supplies was USD 1,030 for a full-time student enrolled in a community or technical college in Washington (WFAA, 2013) — equivalent to 25% of CTC average tuition cost.

With a single mission aimed at supporting students' completion of their programme of study by reducing the financial burden exacerbated by high-cost textbooks, the Washington CTC system launched the OCL project. Funded by the Washington State Legislature and the Bill & Melinda Gates Foundation, the goal of the project was to develop 81 high-enrolment courses that are openly licensed for easy adoption. It features the collection

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<sup>2</sup> Low-income students are those with less than \$25,000 family annual income.

<sup>3</sup> The current tuition and fees for students enrolled in 15 credits per quarter.

of self-created materials with OER, but also allows for the materials to be paired with low-cost textbooks (\$30 or less) if needed.

The project teams were formed by selecting OCL course developers through a competitive grant proposal process. A large group of system faculty guided the selection process to ensure the qualifications of each course developer. Each winning course team was directly supported by a librarian, an instructional designer, an accessibility specialist, a global education expert, two peer reviewers and a project manager.

OCL adopted the Quality Matters rubric<sup>4</sup> to ensure that each course is designed based on best-practice instructional design principles. Faculty course developers worked closely with their assigned instructional designers to ensure that the course elements achieved Quality Matters standards. Librarians supported faculty by selecting OER and clearing copyright permissions with any materials used in the course. Accessibility specialists reviewed every course and provided recommendations for ensuring that the course materials and assessments were accessible to students with disabilities. Finally, a global education expert helped faculty designers develop their courses that included global themes appropriate to their content areas, and weave critical perspectives throughout the curriculum (Redd, 2011).

Development of the OCL occurred in two phases. The first 42 courses were developed in Phase 1 (released in October 2011). During Phase 1, the first two quarters<sup>5</sup> were spent designing course elements (objectives, assignments, readings and assessments) leveraging existing OER (Caswell, 2012). Digital course materials were stored in the ANGEL learning management system (LMS). Participating faculty taught their newly designed OCL courses during the third quarter as a pilot.

The remaining 39 courses were developed in Phase 2 using a similar course development process (released in April 2013). However, with Phase 2, OCL made a structural change in the repository system based on lessons learned during the first development phase. It was observed that many faculty interested in adopting the courses considered that logging into ANGEL was a barrier to accessing the OCL materials. Recognising this challenge, the OCL team made a decision to use Google Drive as the new home for all OCL materials.

The outcome of the project was 81 open course packages released under a Creative Commons Attribution licence, which allows free remixing and repurposing without restriction. Each course package contains a collection of shareable course materials, including syllabi, course activities, readings and assessments. After releasing all 81 courses, student Public Interest Research Groups (PIRGs) conducted an analysis of the cost-saving potential of the 81 courses contained in the OCL.

The analysis estimated that students who take OCL courses save \$96 on average per course and, in sum, the OCL has saved students USD 5.5 million since its inception. This is well beyond the initial USD 1.8 million investment. However, due to the open nature of these courses, the SBCTC

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4 The Quality Matters rubric is a set of eight general standards and 43 specific review standards used to evaluate the design of online and blended courses.

5 An academic quarter refers to the division of an academic year into four parts.

OCL team is unable to track down more specific usage data regarding the full extent to which these courses and their materials have been adopted. Yet, we do know that some of the OCL courses have been widely used not only in the Washington CTC system, but also nationally. For example, a couple of faculty members from the system, David Lippman and Melonie Rasmussen, published an open textbook for Precalculus through the OCL project. The book's webpage has had almost 60,000 visitors and the book's PDF file has been accessed over 127,000 times. Additionally, as of February 2014, students had purchased over 5,000 copies of the book for roughly \$15 per copy.

The OCL project was a significant step for our system as we strive to establish and encourage a culture of open sharing in Washington's colleges. According to our 2014 state-wide survey, a majority of faculty identified OCL as their first exposure to the OER. Many of the current OER advocates in the system were involved with the OCL project either as a course developer or a support staff.

- **Application level** – The OCL project clearly opened a door to the new era of OER for Washington's CTC faculty. During the promotion of the project, however, many system faculty expressed feelings of uncertainty about OCL adoption and OER implementation in general. In response, SBCTC conducted qualitative research using a few focus group interviews. In this way, it learned that faculty's feelings of uncertainty were a result of misunderstanding what OER are, in addition to a general lack of knowledge and skills in how to find and apply OER.
- *OER training*: To support this need, SBCTC launched, in 2013, state-wide training in how to use, find and apply OER to the teaching practice. This training focuses on providing the practical knowledge and skills in using OER rather than fostering theoretical or philosophical conversation about open education. Some of the topics covered in the training include: how to differentiate between open licensing, public domain, and all rights reserved copyrights; how to identify resources that are open licensed or in the public domain; how to distinguish the different types of Creative Commons licences; and how to find OER and properly attribute their authors.

This is a two-week online, asynchronous course and participants are expected to spend 10 hours to complete the course. It is fully facilitated training that gives participants an official certificate on successful completion.

This training has been well received and over 800 faculty members were trained in the first year. In January 2014, SBCTC extended the invitation to out-of-state community colleges that received a grant from the Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grant Program of the U.S. Department of Labor to help them release their grant works under a Creative Commons licence (as required by the grant).

- *Open Washington*: During the qualitative research by SBCTC in 2013, faculty stressed the need for Web resources that provide easy access to OER. They cited significant difficulty in using currently available OER because of a lack of guidance and poor organisation of the materials.

In short, faculty said they wanted to have a one-stop referral mechanism with pre-selected resources, curated with critical information about OER, including all the available resources at their disposal. They also mentioned the need to know the unique traits of each OER repository, to avoid having to check every possible resource.

In response to this need, SBCTC launched Open Washington<sup>6</sup> in 2014, an OER network for Washington's CTC faculty. This website is dedicated to providing easy pathways to enable faculty to learn, find, use and apply OER. It provides step-by-step instruction in self-paced modules to help faculty integrate OER into their teaching practice by explaining to them what the concept of OER is, how to find resources, how to make sense of the various licences, and how to attribute the sources they plan to adopt or modify.

The site also offers a categorised search guide for all types of OER, selected based on the clarity of organisation, appropriateness of the licensing status, and usefulness of the resources. To make the search process more efficient and effective, each repository is introduced with information about its unique traits (including type of resource, subject matter, education level, etc.), licensing information, and an example of how to attribute the source.

Finally, Open Washington features a community page that fosters collaboration and active communication among faculty in the use of OER. The community page also highlights the OER initiatives implemented by the system's 34 colleges, presents OER implementation stories provided by individual faculty from various disciplines, and lists professional development opportunities offered by the colleges and SBCTC.

The Open Washington website has become a community hub for Washington's CTC faculty to visit to receive or offer support in any stage of OER adoption. It had over 30,000 visits within the first six months and the usage rate continues to grow. The content of the website is constantly updated, and SBCTC restructures the site annually based on the new information provided by the new research data and the guidelines from new policy requirements.

- *Open Attribution Builder*: It was discovered, as SBCTC provided the training and consultation for Washington's CTC system faculty, that confusion over attribution and licensing was a "pain point" for many in the system who wanted to take advantage of OER. Most open licences, including Creative Commons licences, legally require the users to make a proper attribution to the original authors and note the exact name of the licence with a hyperlink to the licence deed page. This has been perceived as a complicated task and many faculty expressed nervousness in creating a proper attribution with all the required information intact.

To eliminate this barrier to using OER easily and correctly, SBCTC launched an application called Open Attribution Builder.<sup>7</sup> This application helps faculty and students easily cite open material they find: as users fill out the form, the application automatically generates the attribution. Since its

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6 <http://www.openwa.org/>

7 <http://www.openwa.org/attrib-builder/>

launch in September 2014, a large number of websites have widely praised this simple application and recognised the useful tool it is.

The Open Attribution Builder empowers faculty to be more active and engaged in integrating OER into their practice, as it removes their concerns over inappropriate use of OER. The lesson was again learned: *A big systemic change can be achieved from simply removing a small but critical obstacle.*

- **Outreach level** – Having been recognised as one of the national open education leaders in the U.S. through our works in OER initiatives and open policy, the Washington CTC system and SBCTC have received numerous requests from other colleges and governmental bodies to extend our services. We have supported those requests by offering our resources, providing consultations and creating partnerships.

One of the most prominent outreach efforts SBCTC has engaged in is with the Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grant Program of the U.S. Department of Labor. TAACCCT provides community colleges with funds to expand and improve their ability to deliver education and career training programmes and to prepare programme participants for employment in high-wage, high-skill occupations. This programme has so far awarded grants to nearly 800 community and technical colleges nation-wide. It is likely to be renewed for an additional round of funding. The U.S. Department of Labor set an open licensing policy for all grantees of the 800 community and technical colleges, and requires them to release all deliverables produced through the TAACCCT grant under a Creative Commons Attribution licence.

The purpose of the Creative Commons licence requirement is to ensure that materials developed with funds provided by these grants result in works that can be freely and openly used and improved by anyone in the world. In supporting this effort, the Bill & Melinda Gates Foundation funded four U.S. organisations (called “OPEN Partners”) to help TAACCCT grantees meet the OER requirement and offer support for learning key lessons on course design and accessibility. Since January 2014, as one of the four OPEN Partners, SBCTC has supported TAACCCT grantees by providing fundamental training in the proper use of OER. This has been flagship training for all grantees, and helped them acquire practical knowledge in how to use, find and apply OER to their teaching practice.

## Open Research

All system-wide initiatives and policies in OER and open education in general are designed based on the data continuously produced by the research effort put forth by SBCTC and the open education community in the Washington CTC system. Since 2011, numerous state-wide studies have been conducted to identify faculty needs in terms of adopting OER and to identify the best support model to encourage and foster greater use of OER.

Our most comprehensive study<sup>8</sup> was published in January 2014. It is based on interviews with 60 faculty members in Washington’s CTC system and built on

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8 <http://goo.gl/dERBtX>

a previous state-wide survey of 780 faculty members. First, this study examined the spectrum of faculty's use of OER and their motivations for implementing the resources in their instructional practice. Second, the study categorised the benefits and challenges that faculty experience using OER. Finally, it synthesised faculty responses pertaining to the types of institutional support needed for OER implementation. This is one of the most comprehensive research reports focusing on community college faculty's use and needs in OER. It was recognised by the Open Education Consortium with the 2015 Open Research Award for Open Education Excellence.

## Conclusions

In Washington State's CTC system, all the elements described in this chapter have become the foundation for an ever-expanding infrastructure that supports the creation of OER and the dissemination of the principles and practices of open education. This framework enables the application of OER to a multitude of innovative instructional projects that will continue to benefit faculty and students in Washington State's CTCs for the foreseeable future. After five years of large- and small-scale OER initiatives conducted and supported by SBCTC and the Washington colleges themselves, our research shows clear evidence of the emergence of a system-wide competency in the application and support of OER.

SBCTC continues to support the development of OER competency in Washington's CTC system by:

- supporting OER-based instructional initiatives for individual colleges and the development of innovative and shared programmes among colleges;
- supporting professional development by faculty and staff in OER use in the form of training, webinars, conferences, faculty learning communities and other events;
- integrating OER in all instructional strategies for improving affordability and access, including basic education for adults, corrections education, competency-based education and other large-scale programmes; and
- conducting a programme of research to understand and respond to faculty attitudes and needs around the use of OER, and to determine the most effective and efficient means to continually improve support by addressing emergent needs and gaps in support for our population of users.

While significant challenges remain to the comprehensive application of OER to instruction in our system, our open policy implementation framework and system-wide culture of sharing have allowed Washington's CTC system to make significant strides in the OER ecosystem in a relatively short time. From initial ambitions made manifest in planning and policy, the system has moved quickly to a level of competency shared across the system. The result is a culture that welcomes OER as an important means of supporting common goals of access, affordability and educational quality for the citizens of Washington State.

We believe that the framework described — with its principles and touchstones for effective practice — are highly adaptable to many contexts.

It begins with advocacy for OER that embeds open education principles in a strategic planning process. With the authority of a strategic plan that outlines clear action items related to OER, a policy is needed next to support the actions required to fulfil the mandates of the plan. An infrastructure of rules and checkpoints must then be established to regulate and manage the policy requirements. The outcome of this support and guidance will inform the design and implementation of future open initiatives and help create a rubric for both producers and evaluators of those initiatives.

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# Conclusions

*Fengchun Miao, Sanjaya Mishra and Rory McGreal*

Since the 2012 Paris Declaration on OER, only a small number of countries have developed national policies for OER. However, the interest in OER with or without policy implications has grown, as reflected in the literature on the subject (see OER Knowledge Cloud<sup>1</sup> and OER Impact Map<sup>2</sup>). The number of conferences and seminars organised on the theme grows every year.

The chapters covered in this book, from 15 countries across six continents, do not just tell stories that can help nations and institutions mainstream OER into their national systems of teaching and learning; they provide possible answers to the following key questions:

- What are some of the global trends in OER development? How are OER policies and initiatives developing and changing in scope to respond to the problems OER have the potential to address?
- What are some actual outcomes of OER policies and initiatives? What have we learned from existing initiatives? What are the reactions from major stakeholders, and what challenges do those stakeholders face?
- What are the next steps for policy-makers to take? What can national education authorities, the private sector, and other partners do to promote OER?

## The Global Trends

A “one-size-fits-all” scenario does not work in most development contexts, and this is true for the OER movement. The Paris Declaration on OER was developed, targeting the world as a whole, and countries are formulating diverse approaches

1 <https://oerknowledgecloud.org/>

2 <http://chaos.open.ac.uk/>

to implementing the declaration through OER policies and initiatives that can lead to meaningful impacts, which in turn can address national educational challenges. There are no simple solutions, because initiatives must take into account national education structures, the education population that is being targeted, that population's ICT readiness, the funding of OER, experiences with previous ICT policies and initiatives, the co-operation among stakeholders (including public-private partnership and global collaboration), and societal, political, and economic contexts.

As reflected in the chapters in this book, OER are being used to address a variety of educational challenges — from increasing access to improving quality and reducing costs. The focus of OER use has been expanded from higher education to other levels and sectors of education. The African Storybook project discussed in Chapter 14 aims to assist literacy improvement through storybooks made available in local languages in four countries of Africa. This has resulted in low-cost access to storybooks in local languages. And, as OER, these books can be easily adapted to more languages, increasing the ability of large numbers of school children to use the books, and helping to keep the cultures and languages alive.

In seven of the 15 countries covered in this collection of case studies, higher education remains the focus of OER use. In four other countries — Antigua & Barbuda, the Sultanate of Oman, the Kingdom of Bahrain, and Poland — the use of OER is at the secondary level. The Sultanate of Oman and the Kingdom of Bahrain have accepted OER as a means of addressing an increasing need to shift away from a natural-resource-based economy to a knowledge-based society, thus ensuring sustainable development. Making available educational resources in Arabic is also an important issue for the governments there, and positioning of OER in those contexts is important because few citizens understand English.

In terms of policy engagements and developments, two chapters (Chapter 3 on Brazil) and Chapter 4 on Canada) focus on OER initiatives at the sub-national level (city/state in Brazil; provinces in Canada) and on institution- and community-based initiatives supporting open education.

National policies are the subject of several chapters. In Chapter 7, the formulation of OER policy is described as part of India's flagship National Programme on Technology-Enhanced Learning (NPTEL). Other national initiatives include Australia's open licensing framework for publicly funded information (Chapter 1) and Russia's open licence related law (Chapter 13). The *Higher Education Act* of 2012 in Indonesia (Chapter 8) has been interpreted as an alternative for OER policy, albeit without any reference to open licencing. The ICT in Education Policy of Antigua & Barbuda (Chapter 5) covers open licence, and countries such as Bahrain (Chapter 2) and Oman (Chapter 11) have integrated OER policy into a broader ICT in Education Master Plan. A common thread in most of the cases, though, is the involvement of the communities to push for the policies, leading to recognition of a bottom-up approach.

Some of the reports visualise OER in the context of reusing global resources for local needs and extending local knowledge to the world. Antigua & Barbuda has taken steps to develop open textbooks and is a model to follow in the Eastern Caribbean States. At the institutional level, policy development at the Washington Community and Technical Colleges System (WCTCS) (Chapter 15) and the case

study of Wawasan Open University (Chapter 9) stand out. While the former adopted a systematic approach to mainstream OER, and integrated research, project and policy in a framework, the latter has adopted a systemic process of quality assurance of integrating OER into the course development process.

As multiple stakeholders need to be engaged to promote the inter-sectoral use of OER, there can often be a tension during the process of policy development, especially from the publishers, as shown in the case of Poland (Chapter 12). Also in India, the implementation of the NMEICT OER policy has generated a huge amount of material, and so the publishers were interested largely in supporting the policy in terms of re-using the content. Where textbook procurement from private suppliers is a practice, the publishers may see OER and open textbooks as a threat to fair practice. However, as in the case of the Polish implementation, the European Commission intervention helped to calm the situation.

Embedding pedagogical design into the OER development process has become a widely accepted trend. The course development team established under the initiative of Washington State's WCTCS (Chapter 15) intentionally included instructional designers, and all course packages contain course activities. It further provided a one-stop referral website with curated resources, structured with easy pathways for faculty to learn, find, use and apply OER. Countries such as Bahrain and Oman are trying to incorporate the new ways of teaching and learning by adopting OER and building capacities of teachers to adopt the same. In the Caribbean case study discussed in Chapter 5, OER help teachers create an engaging classroom by giving learners the opportunity to explore resources from around the world. Transforming students' roles in learning and engaging them in making sense of the world through the use of OER are expected to create individuals who are self-regulated and determined to succeed. Educational institutions in Germany are following a path of open educational practice, which goes beyond OER and is also a trend in Europe.

Creating awareness of OER, involving teachers and students in OER, and sustaining OER projects are seen as the major challenges in most cases. Most of the chapters provide examples of strategies and capacity-building programmes to raise the awareness of OER among teachers and students, and enhance the understanding of OER from the general public. Raising community awareness about OER has been listed as a top priority in the Arab States because it links highly with lifelong learning. Considering that successful initiatives like the OERu are community driven, investment in advocacy has an important role to play in the OER movement.

Important to remember is that most OER movements have taken place fairly recently. Most countries are still in the initial stages of implementing policies and initiatives, and a strong evidence base is yet to emerge to support further policy development. For example, in the open textbook initiative in the Caribbean (Chapter 5), results have shown that teachers welcome the use of OER and consider it as a potential innovative approach to improve teaching and learning. However, lack of electricity, low Internet bandwidth and network failure all impede progress.

## Lessons Learned

Constantly looking back at what has already been accomplished is essential in deciding what to do next. Even though most policies and initiatives started less than three years ago, there are many valuable lessons in this book. We present some of these here.

### Policy

The most important lesson on the development of institutional policy is that shown by the WCTCS case (Chapter 15), where an evidence-based approach to policy formulation helped adoption of OER in the institution. The WCTCS case presents a model consisting of three components: open research, open policy, and open initiatives. The relationship among the three can help other institutions (regardless of which stage they are at in the OER implementation) understand how an effective OER policy cycle functions. The ideology is that open research provides evidence for both open policy and open initiatives, and then open policy further supports open initiatives.

What works at the national level to adopt OER policy varies depending on the context. While we see that grassroots-level engagements to push for policies have worked to some extent in Brazil, Canada and Poland, it is more a top-down approach in other countries, such as being the law in Russia and Indonesia (to some extent). Appreciation of top-level leaders and decision-makers about the advantages of OER and their alignment to a national development agenda makes it easier to adopt policy, as the case of the Sultanate of Oman and the Kingdom of Bahrain show. In the case of the NMEICT open licensing policy in India, it was possible because of the involvement of a community of teachers from top technology institutions in the country, and the involvement of an intergovernmental agency (the Commonwealth of Learning [COL]) and ministry officials.

So, another key lesson is the need to foster a deep engagement with the stakeholders to: demystify copyright and OER; continue advocacy efforts on a regular basis; and work with the content developers and institutions for capacity building in OER.

While recognising the power of policies, we also need to acknowledge that initiatives started at the root of the problem can sometimes provide the bottom-up driving forces and early-adopters' lessons. For example, even though Australia is promoting OER at the higher education level, some Australian higher education institutions did not wait for government intervention or support. Rather, they started taking open educational practices seriously and engaged in developing and reviewing some of their institutional policies. This is a very good example of combining the two approaches. When the policy starts pushing the OER movement from the top, while ground-level initiatives push forward the actions, the impacts are likely to go beyond the initial expectations from either side. This happens more often in institutions that have some autonomy.

Another policy lesson learned is that formatting an OER policy can have an impact on the education movement, but this depends heavily on the compatibility and maturation of the country's system and OER development.

Germany is an outstanding example. German academia adopted open access in 2003, and therefore do not consider lack of learning materials in digital format a major problem in education. While the movement of shifting from the “protected mode” of educational resources to “opening up” research-related materials was aggressive, the German educational community goes beyond OER to open educational practice. It considers that providing access alone to all the resources cannot address problems with teaching and learning. Therefore, OER are embedded into educational pedagogy to increase learning outcomes. So, in Germany, even though the open policy has been in place since 2003 in many institutions, it was only considered for research materials; teaching and learning materials, such as textbooks, were not considered a problem. Policy development is not progressing in linear steps and policies sometimes are not implemented as expected.

## Costs

One of the most important reasons for the rise of OER is the spiralling costs of educational materials, especially textbooks for students. While OER are freely available, they do not come free. Someone eventually pays for the creation of the resource. Important to note is the notion of providing free access along with the ability to adapt without permission when the resource is developed with public funds. If something is supported by taxpayers’ money, it is important that such a resource be available to all to use, reuse, remix and build on to apply the resources to another context and to optimise the cost of development of that resource. In the United States, the cost of textbooks has risen more than 15-fold since 1970, three times the rate of inflation.<sup>3</sup> Many students do not even register for courses because of the high cost of textbooks. Open textbooks and OER have been able to change this scenario because of their low cost and almost zero cost of digital distribution. However, sustainability of OER projects remain an issue as the cost of creating OER still has to be covered by someone.

This book gives two examples of cost savings from the use of OER:

- First, Malaysia’s Wawasan Open University (Chapter 9) has tested three course material production models: 1) using proprietary course materials under licences; 2) producing stand-alone materials; and 3) developing OER using the “wrap around textbook” model. The university had to pay a heavy licence fee for the proprietary learning materials, and the development time for the stand-alone materials was 12–18 months. Both these models were time consuming and not cost-efficient. At the initial stage, the two were popularly adopted, although the university had to bear the costs of the proprietary course materials; it was considered a “necessary trade-off to operationalise the university within a limited time frame.” Because of the financial burden that the university has experienced in the past, it moved to the second model, which allowed developing its own high-quality and peer-reviewed course materials. However, use of the OER as wrap-around text has reduced time, and the content is also of good quality because the university followed a strict quality assurance process. This example shows that cost considerations should not always be only from the perspective of savings

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3 <http://www.economist.com/news/united-states/21612200-its-economics-101-why-textbooks-cost-so-much>

associated with students buying the textbook. Instead, the affordances of using already existing materials and savings due to efficiency of operation should also be considered.

- Second, the case of OERu (Chapter 10) follows a collaborative model to optimise resources. The OERu is an international collaborative platform that uses a common infrastructure to reduce operational costs and generates revenues by providing services to learners. In 2014, the OERu model generated 72% of its operational costs through membership fees. The OER model shows the possibility of teaching and learning without heavy reliance on donor funding. It also shows that open textbooks and OER can be sustainable, and that it is possible for institutions to come together and develop these collaboratively for their learners. To provide cost-free or low-cost OER, philanthropic, governmental and intergovernmental agency support are not always necessary.

## Transformation

The major transformations that OER policies and initiatives can bring are: the change of mindset towards teaching and learning methodology; new channels to obtain education; and opportunities for knowledge sharing. In particular, OER promotes knowledge as a public good, and the sharing of knowledge resources with open licences helps everyone — students, teachers, institutions and public in general — promote lifelong learning.

The OER movement has also been challenging the traditional textbook publishing business. Some new publishers (like Lumen<sup>4</sup>) are now testing the open licence approach to build a business model around open textbooks.

While educational thinkers are concerned about the “tell and test” system of education prevalent in many parts of the world, integration of OER into teaching and learning at all levels brings the possibility of new approaches in the classroom. The classroom model of teaching and learning was originally a model based on scarcity of information, where a sage interprets the knowledge of the world for the pupils. The introduction of textbooks into classrooms changed that to some extent but also brought in new challenges related to access and cost. OER changes the ecosystem of teaching and learning once again through the abundance of information, available free to anyone with access to the Internet. This is a game changer. As the learner can have access to digital materials at any time outside the class, teachers are challenged to adopt new pedagogical approaches such as the flipped classroom and problem-based learning. The learner has also become a partner in teaching and learning, as he or she can actually participate in the development of OER as well. Countries such as Bahrain and Oman are trying to incorporate the new ways of teaching and learning by adopting OER and building capacities of teachers to adopt those ways.

OER are bringing transformation at another level as well, with open universities around the world benefiting from the OER movement. Content has always been considered king by open universities that largely teach at a distance using printed or digitised textbooks and communication technologies. OER help transform the industrial model of open universities’ content development, and allow them to

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4 <http://lumenlearning.com/>

devote more time to learner support. There is also a growing move towards use of Massive Open Online Courses (MOOCs) (as shown in Chapters 4 and 13) in the higher education sector, which is leading towards more self-directed, self-determined learning needed for lifelong learners. The OERu model, discussed in Chapter 10, presents an innovative approach towards providing credentials from across a range of institutions. In co-operation with several distance learning institutions, the OERu allows students to cross-register for courses to earn certification equivalent to degrees offered by the institutions in their country. This benefits students by helping them: broaden their learning spectrum; study under different cultures and systems to challenge their adaptability; and gain global knowledge sharing. However, this approach also puts more pressure on organising teaching efforts and developing relevant and appropriate OER.

Transformation is also underway in the mindset of what copyright is. In many countries, regardless of whether publishers or booksellers boycott the shift, authors are taking ownership of their works and asserting their rights to license their work for greater visibility and use. OER are challenging the idea of intellectual ownership and transformation in the mindset of authors and contributors. As captured in the open licence policy of NMEICT (described in Chapter 7), licensing is now seen as a means “to foster an environment of openness, collaboration and a culture of sharing, reuse and adaption amongst institutions and teachers to enhance the quality of education.”

## Future Pathways

Every country and institution needs to look internally and learn from external practices to develop its own path to adopt and mainstream OER. The OER movement has a long way to go, and the case studies in this book do not necessarily provide the last word in the field. However, they do provide pointers and early pathways that should be considered by all stakeholders.

The following key actions need the attention of policy-makers in national governments, intergovernmental agencies and donor agencies and foundations; and of OER developers and users:

- *Promoting OER in technologically disadvantaged regions:* Many regions and countries are technologically disadvantaged compared with others in the world. Most African countries still face electricity and connectivity concerns that have hindered their active involvement in adopting OER in education. About eight institutional OER policies are in place in Commonwealth Africa<sup>5</sup> (Isaac, 2015) and in a number of grassroots activities, and six Eastern African countries have developed a framework of OER policies.<sup>6</sup>
- *Reinforcing training for teachers in producing and sharing OER:* Teachers play an important role as developers and contributors of OER, and they are also instrumental in the use of OER in the teaching and learning situation. Building the capacities and capabilities of teachers to effectively use ICTs and develop OER is essential to integrate OER into the day-to-day activities

5 <http://oasis.col.org/handle/11599/1674>

6 [http://www.unesco.org/new/en/naïrobi/about-this-office/single-view/news/african\\_countries\\_to\\_develop\\_national\\_policies\\_to\\_adapt\\_open\\_educational\\_resources\\_oer/#.Vq-Q7IrlGs](http://www.unesco.org/new/en/naïrobi/about-this-office/single-view/news/african_countries_to_develop_national_policies_to_adapt_open_educational_resources_oer/#.Vq-Q7IrlGs)

of a teacher. Several countries (e.g., Germany) have voiced the concern that simply providing OER is not enough because it is more important for OER to be included in the pedagogy, which endorses the important role of teachers in realising the full potential of OER.

The ICT Competency Framework for Teachers (ICT-CFT)<sup>7</sup> developed by UNESCO establishes the guiding framework for the skills required by teachers to achieve effective pedagogical use of ICT in teaching and professional development. UNESCO has also assisted Member States to develop training programmes that reflect the use of OER. Using the ICT-CFT model, COL has developed the Commonwealth Certificate on Teacher ICT Integration.<sup>8</sup> These modules are available with open licence to be adopted or adapted for teacher training in local contexts. COL has also developed a short online course, “Understanding Open Educational Resources,” which is available as an open course at the Technology-Enabled Learning Lounge.<sup>9</sup> Uptake and use of these resources would further help build teacher capacities.

- *Promoting international collaboration to promote aligning the adoption of OER under the Education 2030 agenda:* Both UNESCO and COL are active OER advocates and have been collaborating to provide professional and systematic assistance for national OER policies and initiatives. It is important to bring together other international NGOs and foundations working in this field to promote OER. Beyond the 2012 Paris Declaration, OER has received the attention of the global international community and governments in the form of the Qingdao ICT Declaration<sup>10</sup> (2015). In the latter, they have committed to developing sector-wide strategies and capacity-building programmes to fully realise the potential of OER to expand access to lifelong learning opportunities and achieve quality education. The global agenda for Education 2030 — with a view to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” — was adopted as Sustainable Development Goal 4 (SDG4) (among the 17 SDGs) at the 70th Session of the United Nations General Assembly in September 2015.

UNESCO is entrusted to lead and co-ordinate the Education 2030 agenda. To fulfil this mission, UNESCO has been developing the Education 2030: Framework for Action,<sup>11</sup> which was adopted by the UNESCO General Conference (2015). The Framework for Action provides guidance on the development of the agenda, and it recommends that governments and partners harness the potential of ICTs and OER.

The development and implementation of national plans under Education 2030 will provide historic opportunities for governments and others to align the adoption of OER with long-term national education sector development strategies. This will require substantial funding, and it is therefore important

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7 <http://www.unesco.org/new/en/unesco/themes/ICT/teacher-education/unesco-ict-competency-framework-for-teachers>

8 <http://oasis.col.org/handle/11599/676>

9 <http://tell.colvee.org/>

10 <http://unesdoc.unesco.org/images/0023/002333/233352E.pdf>

11 [http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ED/ED/pdf/FFA\\_Complet\\_Web-ENG.pdf](http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ED/ED/pdf/FFA_Complet_Web-ENG.pdf)



to bring international NGOs and foundations working in this field together to promote OER.

- *Designing sustainable funding and societal mechanisms to support OER operations:* Funding implementation of OER policies and initiatives needs both public and private funding support. As governments face several challenges to allocate funds for competing needs, education policy-makers must understand the importance of OER and how use of OER can reduce educational expenditure on the purchase of commercial textbooks. While the cost of OER is significantly lower than that of commercial textbooks, effective integration of OER into teaching and learning requires teachers to consider different models of OER usage: adoption (as is), adaptation (both reuse and remix conditions), and curation.

All these steps lead to different cost structures, but not much research is available to completely understand the cost affordances of OER in different use conditions. When publicly funded materials use appropriate licences, the private sector can work to further disseminate them to larger audiences. Certain licence types also promote commercial use of OER, providing an opportunity for innovative and creative entrepreneurship to flourish.

- *Analysing the impact of strengthening the research on OER to provide an evidence base for policy-making:* To provide the evidence base required for policy-making and to monitor and evaluate the effectiveness of the OER policies and initiatives, the impact of OER must be analysed. Current experiments and pilot projects on OER need to engage in research and evaluation to provide evidence. The Research on OER for Development<sup>12</sup> network — supported by the International Development Research Centre (in Canada) and Department for International Development (in the UK) — is currently undertaking several projects to understand the impact of OER in the southern hemisphere. The OER Research Hub<sup>13</sup> at the Open University UK is also recording the impact from published research and conducting its own research to establish the real impact of OER for students, teachers and institutions. More research and evaluation are needed to demonstrate the worth of OER projects and initiatives to the communities they serve.

As editors of this collection of case studies, we see that the international community is ready to join hands to work towards all the above action points. A review of the progress of OER since the 2012 Paris Declaration is also important to undertake, to assess the effectiveness of the achievements.

This volume can probably be considered a mid-term assessment of how countries and educational institutions have reacted to the Paris OER Declaration. While progress has been made, a lot more needs to be done by all of us together to realise the full potential of OER in promoting quality education and lifelong learning for all.

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<sup>12</sup> <http://roer4d.org/>

<sup>13</sup> <http://oerresearchhub.org/>





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## PERSPECTIVES ON OPEN AND DISTANCE LEARNING

### **Open Educational Resources: Policy, Costs and Transformation**

Open Educational Resources (OER) — teaching, learning and research materials that their owners make free for others to use, revise and share — offer a powerful means of expanding the reach and effectiveness of worldwide education.

The Commonwealth of Learning (COL) and UNESCO co-organised the World OER Congress in 2012 in Paris. That Congress resulted in the OER Paris Declaration: a statement that urged governments around the world to release, as OER, all teaching, learning and research materials developed with public funds.

This book, drawing on 15 case studies contributed by 29 OER researchers and policy-makers from 15 countries across six continents, examines the implementation of the pivotal declaration through the thematic lenses of policy, costs and transformation.

The case studies provide a detailed picture of OER policies and initiatives as they are unfolding in different country contexts and adopting a range of approaches, from bottom-up to top-down. The book illuminates the impacts of OER on the costs of producing, distributing and providing access to learning materials, and shows the way that OER can transform the teaching and learning methodology mindset.

Recommendations on key actions to be taken by policy-makers, practitioners, OER developers and users are also outlined, particularly within the context of Education 2030.

Clearly, progress is being made, although more work must be done if the international community is to realise the full potential of OER.

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