United Nations Educational, Scientific and Cultural Organization

Sustainable Development Goals

Commonwealth of Learning

Guidelines on the development of open educational resources policies

Education 2030

Guidelines on the development of open educational resources policies

UNESCO Education Sector

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United Nations Educational, Scientific and Cultural Organization

Education Sector

Education 2030

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Foreword

by the Assistant Director-General for Education, UNESCO

Over the last 20 years, the concept of open educational resources (OER) has evolved from a loosely defined term for freely accessible courseware to being a part of programmatic strategies now included in many governmental and institutional policies for expanding access to education, enhancing quality of learning and opening lifelong learning opportunities for all.

At every step of the way, UNESCO has been – and continues to be – committed to its role as a convener of international collaboration for promoting OER. In fact, the term 'OER' was first coined at UNESCO in 2002. Ten years later, the 2012 Paris OER Declaration recommended ways for Member States to promote the use of OER. OER's role in increasing the quality and accessibility of teaching and learning as well as fostering knowledge creation was then further articulated in the Incheon Declaration and Qingdao Declaration of 2015. More recently, in 2017, more than 100 Member States signed up to the Ljubljana OER Action Plan, which lists 41 recommendations to mainstream OER, underlining the importance of strong policies for the implementation of OER.

Indeed, the political will to have comprehensive national OER policies continues to grow. Rather than just appraising the potential of a national OER policy, we can now see the benefits. An OER policy ensures that publicly funded materials are openly licensed. In effect, when the public is allowed to reuse the materials for which it paid, the efficiency and effectiveness of public funds spent on education then increase. In addition, a government that adopts an OER policy helps expand access to quality education, widening the distribution of high-quality educational resources and reducing barriers to learning opportunities.

UNESCO and the Commonwealth of Learning have been working directly with governmental agencies and institutions to support the development of national and institutional OER policies. This publication, *Guidelines on the Development of Open Educational Resources Policies*, is the culmination of this. It is meant to be referenced as a hands-on plan to develop subject-matter knowledge for policy makers on OER and a framework to provoke critical thinking on how OER should be leveraged to address challenges in achieving the targets of Sustainable Development Goal 4 (SDG 4) in different local contexts. More specifically, it can be used as a literal step-by-step guidebook on how to develop an OER policy from conception to implementation.

These guidelines will be of interest to policy makers, the education community and beyond. I hope that the experience shared and the policy approach proposed will help UNESCO Member States transform their education and training systems to more effectively meet SDG 4.

Ms Stefania Giannini

Assistant Director-General for Education
UNESCO

I am sincerely grateful to The William and Flora Hewlett Foundation and the Weidong Group for their financial support in making this publication possible. My special appreciation extends to the authors and the OER community that contributed to the drafting of this book.

Ms Stefania Giannini
Assistant Director-General for Education
UNESCO

Foreword

by the President and CEO, Commonwealth of Learning

Professor Asha Kanwar

President and CEO,
Commonwealth of Learning

The Commonwealth of Learning (COL) became the first intergovernmental organization to adopt a policy on open educational resources (OER) in 2011. As a pioneer in technology-enabled learning, COL found OER to be a natural option for promoting access to quality educational resources in the Commonwealth. Over the years, COL and UNESCO have worked closely to advocate for the use and development of OER around the world. This partnership led to the organization of the World OER Congress in 2012, followed by the Second World OER Congress in 2017, which will always be considered two major milestones in the annals of OER history. Both the events highlighted the uneven state of affairs in OER development across countries and regions, but the one commonality that emerged was the need for enabling policy frameworks for OER.

For instance, the *OER Global Report 2017* found that there was some form of support for OER policies in 56 countries, while 61 other countries indicated that they had been contemplating policy development for OER but did not yet have a policy. Seventy per cent of the stakeholders surveyed reported lack of appropriate policy solutions as the most significant barrier to mainstreaming OER. In addition, the consensus that emerged from the deliberations of the six regional consultations leading up to the Second World OER Congress also reinforced the view that governments must invest in OER policies.

COL believes that knowledge is our common wealth and that OER have tremendous potential for promoting equitable and inclusive quality education and lifelong learning for all. OER emerged as a technology-driven solution to address issues of cost and quality. But OER are also based on values: equity, inclusion, collaboration and respect for diversity. Involving people at the grassroots level is key to the sustainability of OER as a people's movement. Bee-keepers in the remote forests of Uganda have learnt honey-gathering techniques using OER developed by experts who communicate with them through their basic mobile phones. More speed and scale in OER development can be achieved by working together. Linguistic and cultural diversity continue to be a challenge within the OER movement, which is predominantly in English. Farmers in India share their knowledge and expertise freely on a website developed by them in their own language, Tamil – and they release the content using a Creative Commons licence. As more stakeholders share knowledge in the vernacular, the global knowledge base is enriched and enlarged.

Grassroots engagements in OER have resulted in huge successes in Canada and India. However, the joint UNESCO–COL publication, *Open Educational Resources: Policy, Costs and Transformation* (2016) concluded that appropriate policy development at the national, institutional and project levels was a major driving force for the successful adoption of OER. Given the magnitude of the need, it became clear that a new publication on how to develop OER policy in different contexts globally was required. The current joint publication from UNESCO and COL, *Guidelines on the Development of Open Educational Resources Policies*, addresses this gap. This publication provides specific tools to analyse current contexts and policy environments, understand issues related to copyright and licensing and align policy in support of Sustainable Development Goal 4.

This important publication would not have been possible without the support of an international advisory group that provided ideas, critiqued drafts and enriched the *Guidelines*. We are thankful to each one of them for their invaluable contributions. Special thanks are due to colleagues at UNESCO and COL, who have worked long hours to shape the development of this book from concept to creation.

I am sure this publication will assist Member States and educational institutions not only to develop OER policies but also to measure the impact of implementation. Both UNESCO and COL are committed to advancing inclusive and equitable quality education and lifelong learning for all by 2030. This is another milestone in that direction.

Professor Asha Kanwar
President & CEO
Commonwealth of Learning

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Dominic Orr and Ben Janssen served as the main members of the drafting team.

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Contents

List of Acronyms and Abbreviations

ALMS	Access to editing tools; Level of expertise required to revise or remix; Meaningfully editable resource; and Source-file access
BDT	Bangladesh Taka [currency]
CAO	Chief Academic Officer
CC	Creative Commons
CC BY NC	Creative Commons-Attribution-NonCommercial
CC BY ND	Creative Commons-Attribution-NonDerivative
CC BY SA	Creative Commons-Attribution-ShareAlike
CCCOER	Community College Consortium for Open Educational Resources
COL	Commonwealth of Learning
CPT+10	10 years of Cape Town Declaration
ELO	electronic learning environment
ePub	electronic publication
HE	higher education
ICT	information and communication technologies
IMSCP	internet multi server control panel
ISCED	International Standard for Classification of Education
IT	information technology
ITU	International Telecommunication Union
KPI	key performance indicator
LMS	learning management system
MERLOT	Multimedia Education Resource for Learning and Online Teaching
MIL	media and information literacy
MIT	Massachusetts Institute of Technology
MOOC	massive open online course
MYR	Malaysian Ringgit [currency]
NGO	non-governmental organization
NME-ICT	National Mission on Education through Information and Communication Technologies
NPTEL	National Programme on Technology Enhanced Learning
NROER	National Repository of Open Educational Resources
NZGOAL	New Zealand Government Open Access and Licensing) framework

OA	open access
OER	open educational resources
OERR	open educational resources repository
OpenUCT	open repository of University of Cape Town
PDF	portable document format
QTI	Question & Test Interoperability
ROER4D	Research on OER for Development
SAIT	Southern Alberta Institute of Technology
SDG	Sustainable Development Goal
STEM	Science, Technology, Engineering and Mathematics
SUP Numeriques	single open portal for all French open projects
TAACCCT	Trade Adjustment Assistance Community College and Career Training (programme)
TIPS	Teaching and learning process, information and material content, presentation product and format, and system technical and technology
TU of Delft	Technical University of Delft
TVET	technical and vocational education and training
UK	United Kingdom
UNDP	United Nations Development Programme
UNESCO	United Nations Educational Scientific and Cultural Organization
UNEVOC	UNESCO International Centre for Technical and Vocational Education and Training UNFPA
UNHCR	United Nations High Commissioner for Refugees
UNICEF	The United Nations Children's Fund
UNISA	University of South Africa
UNT	Universités Numériques Thématiques
USA	United States of America
USD	US Dollar [currency]
W3C	World Wide Web Consortium
WAI	Web Accessibility Initiative
WIPO	World Intellectual Property Organization

Introduction

Purpose of the guidelines

UNESCO believes that universal access to high-quality education is key to the building of peace, sustainable social and economic development, and intercultural dialogue. In 2015, the framework for action for the Sustainable Development Goal focused on education (SDG 4) was adopted with a vision to 'ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.'

UNESCO was entrusted by the international community 'to continue its mandated role to lead and coordinate the Education 2030 agenda, in particular by: undertaking advocacy to sustain political commitment; facilitating policy dialogue, knowledge sharing and standard setting; monitoring progress towards the education targets; and convening global, regional and national stakeholders to guide the implementation of the agenda.' It is with this mandate that UNESCO, in cooperation with multiple partners, has been supporting Member States in harnessing the potential of open educational resources (OER) to accelerate the achievement of SDG 4.

Through collaborative work, COL and UNESCO support the efforts of governments and educational institutions across the world to introduce OER into teaching and learning – through policy support, advocacy and capacity building.

UNESCO and the Commonwealth of Learning (COL), who publish these guidelines jointly, share the conviction that OER can make a significant contribution to achieving SDG 4 for Education 2030, as stated in the Qingdao Declaration (UNESCO, 2015): 'Open Educational Resources (OER) provide education stakeholders with opportunities to improve the quality of, and expand access to, textbooks and other forms of learning content, to catalyze the innovative use of content, and to foster knowledge creation.' This statement was endorsed by participants of the Second World OER Congress in September 2017 in Ljubljana, Slovenia (UNESCO, 2017). If these potentials are to be unleashed, governments and institutions need to develop and implement sector-wide strategies and capacity-building programmes as a means to use OER to break through barriers in accessing quality education and catalyse open education practices. Through collaborative work, COL and UNESCO support the efforts of governments and educational institutions across the world to introduce OER into teaching and learning – through policy support, advocacy and capacity building.

Until now, this support has taken the form of best-practice insights, reports, on-location workshops and online courses. This publication supplements these tools with detailed guidelines on how to develop systematic and effective policies on OER. Such policies are important to coordinate, strengthen and drive initiatives in a country, which involve actors and institutions on various levels working together to achieve common goals around OER. A sound policy guides strategic action along an agreed path by clarifying how different actors and institutions will work together, and by determining specific goals within a specific period of time for their achievement. Without such a focus, governments and involved institutions will miss the opportunities to harness OER for improving the quality of teaching and learning for all.

These guidelines for policy-makers and other stakeholders lay out steps to review, analyse, develop, implement and measure a context-relevant OER policy. They guide but do not determine what governments and involved actors should do in a specific set of circumstances. Instead, they provide a comprehensive framework for governments and institutions to set out their vision and the scope of their policy, then develop a policy masterplan and launch it.

The key readers of this publication are those directly involved in policy design. The aims of these guidelines are to help these people to:

1. Understand essential subject-matter knowledge on OER through a learning-by-doing process
2. Develop a set of procedural knowledge on OER policy planning, working through key steps necessary for designing a comprehensive OER policy
3. Reinforce the contextual knowledge needed to leverage OER in achieving SDG 4 through assessing the policy context and needs for OER, planning institutionalised programmes and drawing up a contextualised masterplan
4. Ensure the commitment to policy adoption and implementation through integrating stakeholder engagement into the policy-planning process and determining adequate policy endorsement and implementation strategies
5. Enhance the quality of policy implementation by planning a mechanism for monitoring and evaluation, and working towards an evidence-based policy-planning and updating cycle

The guidelines can also be used by people accompanying and supporting policy design, such as:

- Policy-makers in governments and leaders of educational institutions
- UNESCO, COL and other agencies promoting OER
- Officers and specialists of development agencies supporting OER policy development
- Consultants and OER experts who support the development of OER policy around the world

In the case of consultants or evaluators of a running policy, the guidelines can be used as a checklist to identify where current policies have blind spots or have been implemented only partially.

Central to the whole publication is the idea that OER can significantly contribute to improving teaching and learning throughout the world by making high-quality educational provision universally accessible and ensuring that learning content is state-of-the-art. Since OER encourage sharing, cooperation and collaboration between learners and teachers across the world, they can also contribute to international knowledge exchange, social cohesion and a peaceful, sustainable world for all.

Structure of the guidelines

The guidelines describe the whole process for designing and implementing OER policy in seven chapters, each representing a clear phase in the whole process. The chapters introduce the purpose of the phase and provide background information and references with practical examples for illustration. At the end of each chapter, specific tasks are set for the policy-maker, which will help with formulating of the final OER policy.

The guidelines start with an introduction to the potential of OER and then ask the policy-maker to determine the ***vision of the OER policy*** she or he has in mind. This policy needs a ***framework***, which determines on what level of the education system the policy will be set (scale) and which sector of the education system the policy will cover (***focus***). This sets out the first part of the ***theory of change*** – i.e., it determines what change is envisaged through the policy.

A ***gap analysis*** is then necessary to provide a realistic picture of the challenges and the opportunities that the current educational system, its infrastructure, its key members and the overall policy context present for the new OER policy. This can be used as a backdrop for designing the ***masterplan***, which takes the building blocks present in a standard OER policy and specifies them for the specific policy context. These building blocks indicate what is going to be changed.

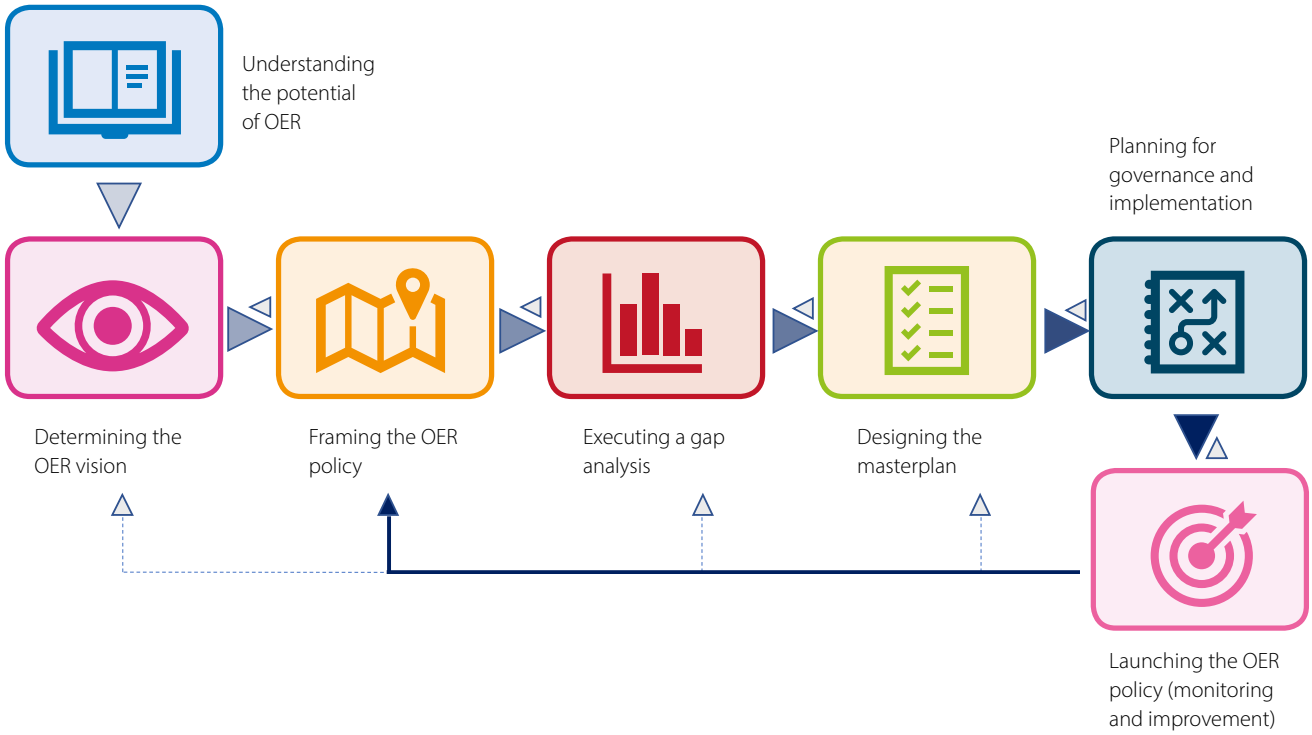
An ***implementation plan*** adopts a strategy for how to realise the masterplan effectively and to ensure that all key stakeholders are involved. This phase includes setting up an evidence base and monitoring framework so that the policy can be adjusted during the implementation phase.

Finally, the policy developed needs to be ***launched***, so streamlining and checks against the reality of the context should be carried out. This is where the policy-makers have to focus on the outreach of the policy. In this phase, a policy needs to be officially endorsed by someone in an authoritative position – for example, the cabinet, education minister or president of a country – and by educational leaders, to ensure that it can have an impact on the education system. Moreover, it is important to ensure that the policy has been understood by those it is hoping to influence – i.e., the actors and institutions using OER to make teaching and learning better. Finally, a policy should be ambitious and aim to reach the mainstream in the future. Therefore, a review of

implementation and its impacts should lead to a discussion of what shape the next-generation policy should take and how the scope and scale of this policy can be extended.

Figure 1 depicts the structure of the guidelines. It particularly highlights that there must be a feedback loop between the planning and launching phases of the policy. Such a feedback loop ensures that the policy is implemented effectively and the expected impacts on teaching and learning can be achieved. An effective policy must go beyond the rational, technical approach and recognise that an intervention works within a 'living system' that can promote or inhibit the real impact of any policy. So the launching phase aims to streamline processes and to prepare for the development of the next generation of OER policy.

Figure 1: Map of the seven-phase policy process



Source: Authors

How to use these guidelines

The guidelines in this publication focus on the perspective of the policy-maker (an individual or a group of people responsible for preparing the policy), who will be supported through a central coordination body. The guidelines further assume that this group of people has the authority and context-specific knowledge to prepare the policy from start to finish.

This group of people will work sequentially through the seven phases and develop the full policy step by step. The tasks at the end of each chapter have been designed to lay the foundations for the full policy. The content of the chapters helps the reader complete these tasks through presenting common concepts and design criteria and by referencing cases from around the world.

Naturally, this publication may also be used by other people involved in developing or supporting the policy-development process, such as external consultants assisting ministries to develop policy. This support may take the form of accompanying and advising the policy-maker and coordination body, or of evaluating the steps in policy design and implementation already taken. In the former case, the external consultant can also follow the step-by-step process. In the latter case, the external consultant might want to begin with the final chapter, which looks at both launching the policy as an event and reviewing implementation for improvements, with a view to developing a more effective policy in the near future.

Chapter 1

Understanding the potential of OER

Overview

This chapter introduces the concept of open educational resources (OER) and puts them in the context of achieving the Sustainable Development Goals for education. Understanding this potential is the cornerstone for designing any OER-focused policy. OER are learning materials that enable reuse and repurposing by others without permission. This allows better access to high-quality learning materials for all through a virtuous cycle of materials being developed, improved and repurposed over time and for different contexts. At the end of this chapter, the policy-maker should have developed clear conceptions of how OER can be used in the local context and have clarity on the licensing requirements.

After reading and working through this chapter, you are expected to be able to:

- ***Explain the meaning of OER***
- ***Identify four components of Creative Commons licences***
- ***Recognise open licences***
- ***Critique the strategic importance of OER in relation to SDG 4***
- ***Relate the concepts of open licences to existing initiatives and developpriorities in your country***

The promise of OER for achieving SDG 4

'OER are a strategic opportunity to improve knowledge sharing, capacity building and universal access to quality learning and teaching resources.'

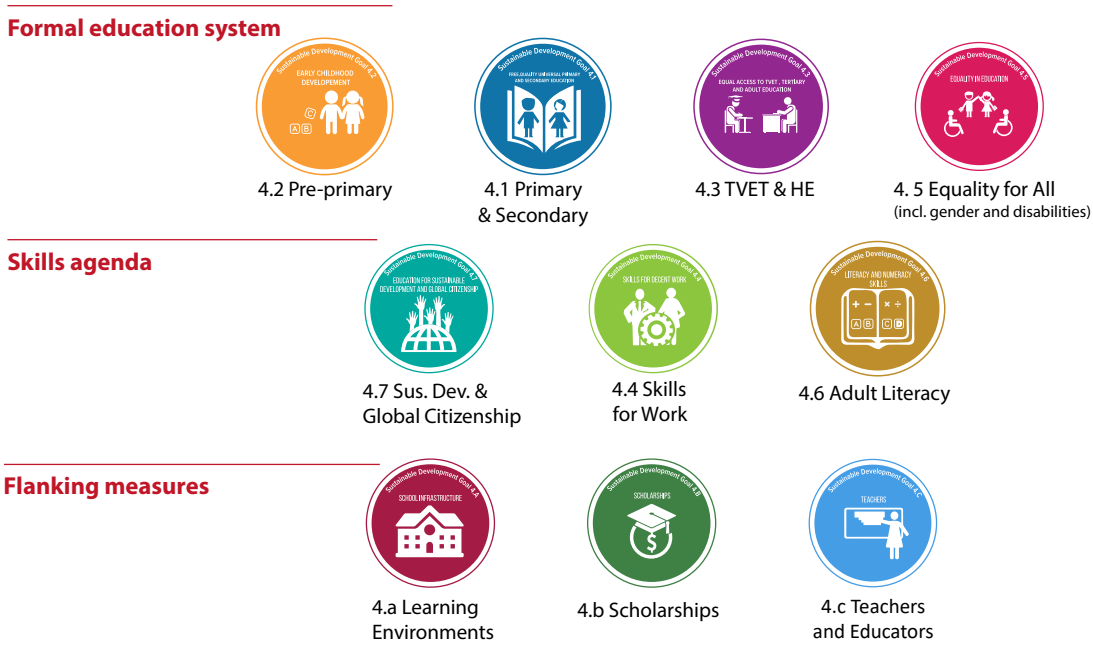
(Ljubljana Action Plan 2017)

Educational systems across the world are being challenged to become more inclusive, to increase the quality of learning provision and to be more responsive to the requirements of society and the economy. These challenges are clearly expressed in the framework for action on SDG 4: 'Ensure inclusive and quality education for all and promote lifelong learning.' The framework lays down the following areas where action must be taken to achieve SDG 4 (UNESCO, 2016a, p. 7):

- To further expand **access** to publicly funded education in the formal education system at primary and secondary levels and to offer a further optional year of pre-primary education.
- To focus on **inclusion and equity** for all parts of the population, including disadvantaged communities and children with disabilities.
- To focus on **gender equality** and to adopt gender-sensitive policies to eliminate gender-based discrimination within schools and the wider education system.
- To provide **quality education**, which develops creativity and knowledge and ensures the acquisition of the foundational skills of literacy and numeracy as well as analytical, problem-solving and other high-level cognitive, interpersonal and social skills.
- To provide **lifelong learning opportunities** for all, in all forms of education and at all levels of education. This includes access to vocational training and higher education and to new forms of informal and non-formal learning, which may provide bridges to the formal education system.

These objectives are further specified in the seven outcome targets and three means of implementation, as shown in Figure 2 (UNESCO, 2016b).

Figure 2: Specific targets of SDG 4



Source: Based on UNESCO (2016b)

The challenges countries face in achieving these targets are comprehensive, and it is important to acknowledge that the use of OER is not a panacea to address all educational challenges. The starting point of a well-informed OER policy should be the resource-related challenges that OER have the potential to address. Examples of those challenges are listed in Figure 3.

Figure 3: Resource-related challenges in achieving SDG 4

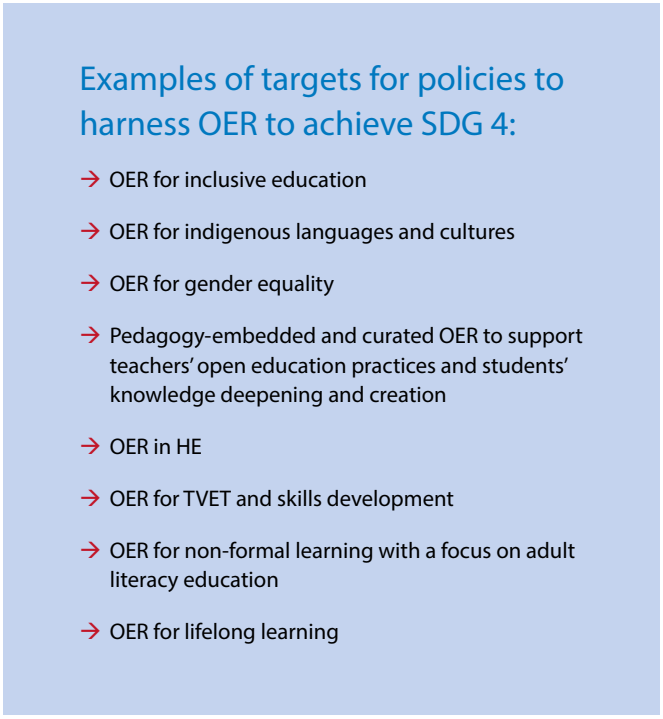
Source: Authors

OER present an opportunity to increase access to high-quality learning materials while allowing materials to be adapted and contextualised for specific regional purposes through open licensing. Of course, free availability or lower development costs make OER an alternative to consider for large-scale deployment.

But OER are about improving teaching and learning through allowing open access to learning materials that can be shared and adapted by others.[1] OER thereby help provoke the creative use of resources by teachers and learners in formal education – from pre-primary to doctoral studies, and for adults undertaking training for work, doing on-the-job training and participating in lifelong learning. As will be discussed in later chapters, the learning environment and the capacities of teachers and instructors to use this potential will have to be supported through the policy to secure an impactful OER policy.

They offer opportunities for the integration of media and information literacy (MIL) and digital education skills into the creative learning process because their openness encourages teachers as well as learners to evaluate, revise, share and collaborate around learning materials, and to develop key competencies in MIL[2] and digital education skills.[3] Moreover, OER can also become catalysts for general reforms and improvement in educational provision, because they encourage social innovation around educational processes (Orr, Rimini, & van Damme, 2015). However, these potentials can only be achieved through a well-designed policy, which starts out from a clear definition of targets for harnessing OER to achieve the main challenge the country or the institution is facing in achieving SDG 4. Examples of policy targets for harnessing OER to achieve SDG 4 are listed in Figure 4.

Figure 4: Examples of targets of OER policies



Source: Authors

If OER are to contribute to SDG 4, they must be mainstreamed in long-term national or institutional strategies, preferably along the entire spectrum of education – primary, secondary and tertiary as well as non-formal learning and lifelong learning. The fundamental pillars of a successful OER policy are: a new regulatory framework for open licences and inclusive access; quality assurance mechanisms for user-generated OER; universally accessible OER repositories; sustainable business models for producing and sharing OER; and continuous training and capacity building for teachers on the pedagogical use of OER. Equally important is research on OER to help enhance the bases for evidence and to ensure

1 For an introduction to the history of the term and the context in which it is discussed, see Jordan & Weller (2017).
2 For more about how UNESCO is supporting MIL, see http://www.unesco.org/new/en/communication-and-information/media-development/media-literacy/mil-as-composite-concept/; also see the visualisation of digital literacy by Mozilla at https://learning.mozilla.org/en-US/web-literacy.
3 COL has developed a framework for digital education leadership for teachers and learners that can be accessed from https://cdelta.col.org.

evidence-based policy planning and adjustment. Where there is lower readiness for or even resistance to adopting OER in education systems, the factors that constitute an enabling environment for a successful education policy are highly relevant for OER policies. Examples of main focus areas and enabling factors for OER policies are listed in Figure 5.

Figure 5: Example of the full structure of a well-designed OER policy

Examples of enablers of OER policies:	Examples of focus areas of OER policies:	Examples of targets for policies to harness OER to achieve SDG 4:	Examples of resource-related challenges. Shortages of:
• Costing and funding • Policy alignment • Monitoring and evaluation • Public awareness • Partnership building and stakeholder engagement	• Regulatory framework • Policy on open licenses • Inclusive and universal access • OER repositories • Quality assurance • Capacity building in pedagogical use of OER • Incentives for teachers' creation and sharing of OER • Sustainable business models for producing, reusing and sharing OER • OER research and evidence	• OER for inclusive education • OER for indigenous languages and cultures • OER for gender equality • Pedagogy-embedded and curated OER to support teachers' open education practices and students' knowledge deepening and creation • OER in HE • OER for TVET and skills development • OER for non-formal learning with a focus on adult literacy education • OER for lifelong learning	• Resources supporting inclusive education • Indigenous language-based and local culturally relevant resources • Gender-responsive resources • Pedagogy-embedded resources to support teachers' open education practices in enabling knowledge deepening and creation • Affordable learning resources for expanding HE • Relevant and affordable resources for TVET and skills development • High-quality and accessible resources for non-formal learning • Resources to support lifelong learning by learners at different ages

Source: Authors

These guidelines will provide a framework for contributing to achieving these targets through the extensive use of OER in national education systems.

Definition of OER and how this can be applied in practice

OER are teaching, learning and research materials that make use of appropriate tools, such as open licensing, to permit their free reuse, continuous improvement and repurposing by others for educational purposes.

The history of advocating for and promoting the use of OER is not new to international organizations and partnerships and started sometime around 2002 with a UNESCO expert seminar (see Box 1.1). Currently, the most recent document is the Ljubljana Action Plan, drafted in 2017, which particularly highlights the importance of good policy for OER: 'Mainstreaming OER requires the creation, adoption, advocacy and implementation of policies supportive of effective OER practices.' It also defines OER as 'teaching, learning and research materials in any medium – digital or otherwise – that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions' (UNESCO, 2017).

Box 1.1: Key documents promoting OER through international partnerships

OER has been identified in numerous international documents as a key innovation to improve teaching and learning. The key documents are listed below. A set of 'Recommendations on OER' as a standard-setting instrument may soon be in place 'to apply the principles and norms' agreed by UNESCO Member States.

Forum on the Impact of Open Courseware for Higher Education in Developing Countries 2002[4]	In 2002, UNESCO convened a group of academics, primarily from developing countries, to discuss a new development: the OpenCourseWare initiative at the Massachusetts Institute of Technology. At this meeting, the term 'open educational resources' was coined.
Cape Town Declaration 2008[5]	In 2007, an international forum convened by the Open Society Institute and the Shuttleworth Foundation led to the Cape Town Declaration. The aim of this meeting was to accelerate efforts to promote open resources, technology and teaching practices in education. In 2018, the CPT+10 was published to celebrate the society's ten-year anniversary. It identified ten key directions to move open education forward.
Paris Declaration 2012[6]	In 2012, UNESCO convened the first World Open Educational Resources Congress, which resulted in the Paris Declaration, containing ten recommendations for how states can promote the use of OER.
Mauritius Communiqué 2012[7]	Also in 2012, delegations from thirty-nine Commonwealth countries met in Pailles, Mauritius to reflect on the theme 'Education in the Commonwealth: Bridging the Gap as We Accelerate Towards Achieving Internationally Agreed Goals'. They highlighted the need to set up a common platform for OER for harmonisation, ease of access, and the development and use of OER to provide quality teaching and learning for all.
Incheon Declaration and Framework for Action for the Implementation of Sustainable Development Goal 4 2015[8]	In 2015, UNESCO together with UNICEF, the World Bank, UNFPA, UNDP, UN Women and UNHCR organised the World Education Forum in Incheon, hosted by the Republic of Korea. This document made two references to OER in relation to increasing the quality and accessibility of teaching and learning through OER materials.
Qingdao Declaration (Leveraging ICT to Achieve Education 2030) 2015 / Qingdao Statement 2017[9]	In 2015 (with follow-up in 2017), an international conference on ICT and education was held in Qingdao, China. The resulting Qingdao Declaration (2015) dedicates a section to 'open solutions' and sees OER as improving the quality of and access to materials, as well as catalysing the innovative use of content for learning and fostering knowledge creation. The Qingdao Statement of 2017 sees OER as contributing to unlocking the potential of ICT for better teaching and learning.
Kuala Lumpur Declaration 2016[10]	In 2016, the Kuala Lumpur Declaration was adopted at the Eighth Pan-Commonwealth Forum on Open Learning (PCF8). With reference to the Charter of the Commonwealth 2013, the UN Sustainable Development Goals, UNESCO's Incheon Declaration and Framework for Action, Education 2030, and the 2012 UNESCO–COL Paris Declaration on Open Educational Resources, it presents a set of recommendations, including mainstreaming the use of OER by developing strategies and policies at governmental and institutional levels to enhance quality while potentially reducing the cost of education.
Ljubljana Action Plan 2017[11]	In 2017, the Second World Open Educational Resources Congress was co-organised by UNESCO and the Government of Slovenia, which resulted in an Action Plan with forty-one recommendations for action.

4 https://unesdoc.unesco.org/ark:/48223/pf0000128515
5 https://www.capetowndeclaration.org/
6 http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/Events/Paris%20OER%20Declaration_01.pdf
7 http://commonwealtheducation.org/wp-content/uploads/2015/08/18CCEMCommunique.pdf
8 http://unesdoc.unesco.org/images/0024/002456/245656e.pdf
9 http://unesdoc.unesco.org/images/0024/002430/243076e.pdf
10 http://oasis.col.org/handle/11599/2661
11 http://unesdoc.unesco.org/images/0026/002607/260762e.pdf

As stated in the OER definition, the openness in OER is enabled by **open licensing**, which gives users free and permanent permission to adapt and reuse (see Box 1.2).

According to the concept of the 'five freedoms' of OER (Wiley, 2014; see also in Figure 6), this means specifically:

As stated in the OER definition, the openness in OER is enabled by **open licensing**, which gives users free and permanent permission to adapt and reuse (see Box 1.2). According to the concept of the 'five freedoms' of OER (Wiley, 2014; see also in Figure 6), this means specifically:

1. **Retain** – the right to make, own and control copies of the content (e.g., download, duplicate, store and manage)
2. **Reuse** – the right to reuse the content verbatim or in its unaltered form (e.g., download, duplicate, store and manage)
3. **Revise** – the right to adapt, adjust, modify or alter the content itself (e.g., translate the content into another language)
4. **Remix** – the right to combine the original or revised content with other content to create something new (e.g., incorporate the content into a mashup)
5. **Redistribute** – the right to make and share copies of the original content, revisions or remixes with others (e.g., give a copy of the content to a friend)

Source: This material is based on original writing by David Wiley and published under a Creative Commons Attribution 4.0 license, available at http://opencontent.org/definition/

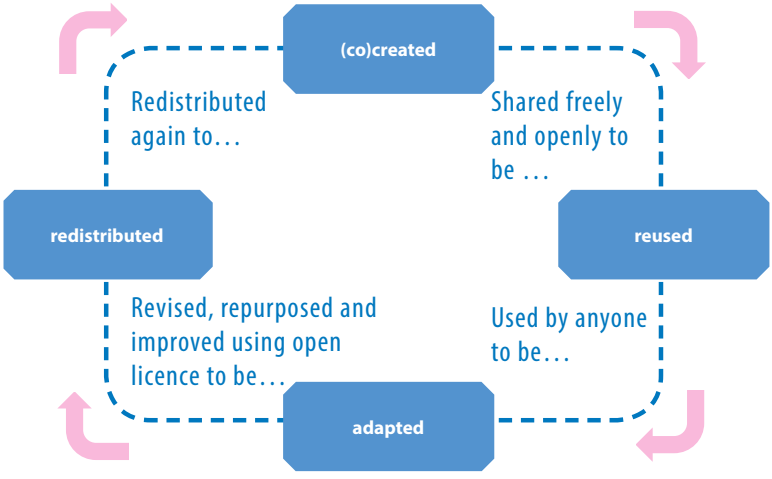
Figure 6: The five freedoms of OER

Source: This material is based on original writing by David Wiley and published under a Creative Commons Attribution 4.0 license, available at http://opencontent.org/definition/. Icons: Getty/DStarky

With these five freedoms, a virtuous circle of improvement is made possible: taking original work from other creators and being able to adapt and repurpose it to produce a new learning resource that has been updated and adapted to the new learning context. In this sense, open means free to access and free to modify.

This lifecycle concept is shown in Figure 7.

Figure 7: The envisaged lifecycle of OER made possible through the five freedoms



Source: Adapted from Cox (2015). Available under CC BY at https://www.slideshare.net/ROER4D/openness-in-higher-education?from_action=save

Box 1.2: The 'open family'

OER belong to the 'open family' of open-source software development, open access to research, and open data. Each of these movements has a commonality with OER in that they also seek to enable more efficient sharing of work between communities to improve accessibility to high-quality materials and to build on the previous achievements of others in a virtuous circle of improvements (cf. Benkler, 2006). They all use a type of open licensing and tend to use digitalisation to enhance the possibilities of sharing, but what they aim to share differs:

- **Open-source software** aims to give people open access to source code, which can be shared and adapted to new applications.
- **Open data** aims to give people access to data, to republish and analyse without restrictions from copyright, patents or other mechanisms of control.
- **Open access** aims to remove the price barrier to academic literature, which is otherwise hidden behind a paywall of academic journals; but it does not always allow those accessing the work the rights to share and adapt the work – this still needs to be done through an open licence.

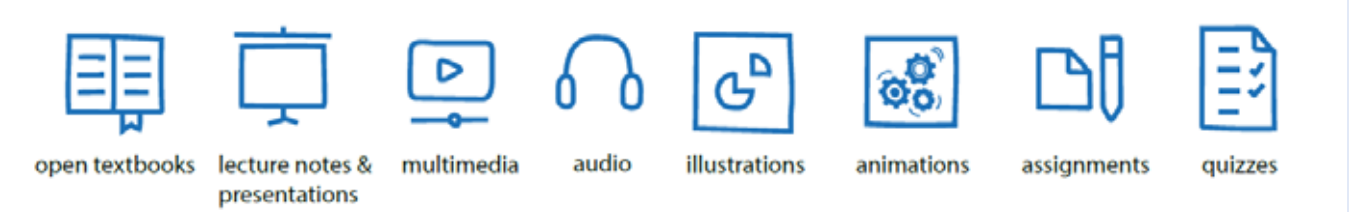
Types of OER

Beyond the conceptual definition, the types of learning resources that can be OER are very diverse. The general characteristics of OER are:

- They can be any type of learning resource.
- They are often, though not exclusively, offered in a digital format.
- The format facilitates the reuse, sharing, adaptation and repurposing of the resource for a different educational setting than the original one, so they are often digital.

So in the field, OER may range from being videos, which can be used to enrich the learning arrangement, through supplementary material, to whole courses (e.g., in the form of open textbooks), which replace the existing materials – see Figure 8.

Figure 8: Different types of OER in the field

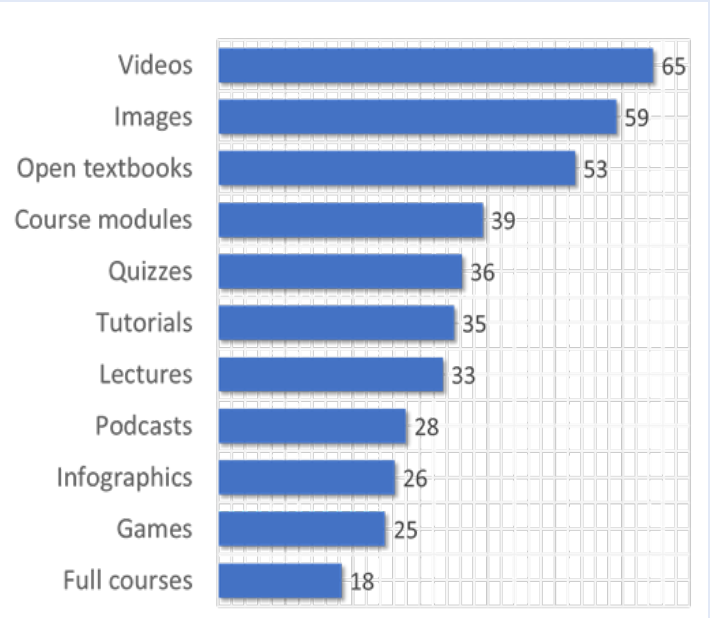


Source: Ehlers et al (2018). Attribution: Ralf Schmitzer, Noun Project, CC BY, except animation icon, UNESCO-UNEVOC/Hayoung Park, CC0.

Results from a global survey by the OER Research Hub (Figure 9) show which types of learning materials users (in this case, educators) often mean when they are referring to OER (de los Arcos, Farrow, Perryman, Pitt, & Weller, 2014). While they use a variety of materials, videos and images are most used by educators as OER, followed by open textbooks and course modules.

This means in practice that a decision to implement OER does not introduce limitations on what types of learning materials can be used. However, it also means that policy-makers must clearly decide which types of learning materials and which educational contexts will be the focus of the policy (see Chapter 3 for this discussion).

Figure 9: Types of OER and the frequency of their use by educators.



Source: Adapted from de los Arcos et al. (2015). Available under CC BY at http://oro.open.ac.uk/47931/1/Educators_FINAL_OERRHData.pdf

The importance of licensing

OER can only be legally free and adaptable as far as the intellectual property rights specified in the licence allow (see also Chapter 5). Therefore, a necessary precondition of any policy development is to clarify which type of licensing will be used. As described before, the five freedoms require that the copyright holder grant the public permission to use, access and redistribute the work with few or no restrictions.

Copyright is a legal right, existing globally in most countries, which grants the owner of the copyright exclusive rights to control how their work is used, reproduced and credited, as well as compensation in association with any use or reproduction of their work (WIPO, 2016). By default, the owner is the author of a work unless they have transferred the copyright to someone else, such as a publisher. Where a work has been produced within a job context, the employer, rather than the author, may hold the rights to the content. Without a specific licence granting permission for reuse or further distribution, content is 'closed'. In many countries, there are specific exceptions to this rule, where a piece of content is being used for educational or academic purposes under 'fair dealing' or 'fair use' clauses of copyright law. However, even in these cases, the amount of the original content that can be copied or adapted is limited and not clear. Public-domain works are an exception.

The term 'public domain' refers to materials that are owned by the public, not a single author or artist. Anyone can use a public-domain work without permission, but no one can ever own it. There are two main ways in which a work becomes public domain: the copyright owner deliberately makes it publicly available or the copyright has expired. The copyright expiry period differs from country to country.

There may also be resistance to using open licensing. This is because copyright protects two rights (WIPO, 2016), and in the case of most forms of open licensing, the author or creator gives these up:

- Economic rights allow owners to derive financial reward from the use of their works by others.
- Moral rights allow authors and creators to take certain actions to preserve and protect their link with their work.

The author or creator may also be the owner of the economic rights, or those rights may be transferred to one or more copyright owners.

The argument to support the use of open licensing is that benefits arise from the provision of high-quality teaching and learning materials due to the advantages accrued through the repurposing and revisions permitted in the licences. The practical trade-off between the benefits and giving up the special rights of authors and creators has led to a variety of licence configurations.

Starting in the 1970s, new licences, which limit the restrictions presented by normal copyright law, have been termed 'copyleft'. This is because a creator of a work gives up to third parties certain rights of use, which they would otherwise retain as creators. But in contrast to normal copyright, the authors can decide which rights of use they give up. In this, open licensing moves the limitations from 'all rights reserved' to 'some rights reserved'.

There are several existing open licences that can be used in national settings.[12] Creative Commons (CC) licences, launched in 2002, have emerged as the most frequently used for open copyright licences and can also be used as reference for any necessary national legislation. Creative Commons licences are non-exclusive and therefore work alongside existing national copyright law and international intellectual property treaties. Creative Commons' suite of open licences and public-domain tools can be used by copyright holders to allow others to share, reuse and remix their works, legally and without having to ask. They are easy to understand and are legally robust. As of 2018, more than 1.4 billion CC licensed works were online on over nine million websites.[13] Box 1.3 provides an overview of the components of CC licences.

12 See, for instance, this list: https://en.wikipedia.org/wiki/List_of_free_content_licenses.
13 See https://stateof.creativecommons.org/.

Box 1.3: Creative Commons licensing[14]

There are four elements to a Creative Commons licence. A copyright holder can use these in combination to determine how they would like to see their intellectual property rights respected.

Icon	Element	Creative Commons description
	**Attribution (BY)**	All CC licences require that others who use the work of a licensor (rights holder) in any way must give the licensor credit the way he/she requests, but not in a way that suggests the licensor endorses them or their use. If they want to use the work without giving the licensor credit or for endorsement purposes, they must get permission from the licensor first.
	**Share Alike (SA)**	This licence lets others copy, distribute, display, perform and modify a work of a licensor, as long as they distribute any modified work on the same terms. If they want to distribute modified works under other terms, they must get permission from the licensor first.
	**Non-Commercial (NC)**	This licence lets others copy, distribute, display, perform, modify and use the work for any purpose other than commercially unless they get permission from the licensor first.
	**No Derivatives (ND)**	This licence lets others copy, distribute, display and perform only original copies of a licensor's work. If others want to modify the work, they must get permission from the licensor first.

Source: adapted from https://creativecommons.org/share-your-work/licensing-types-examples/ available under CC BY 4.0; icons by The Noun Project

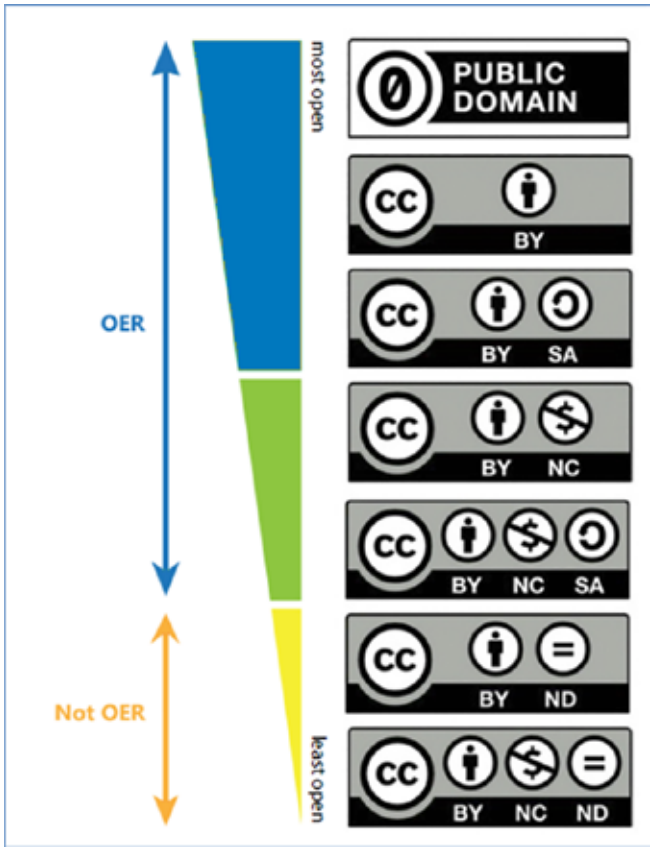
Creative Commons also has a public domain-like dedication called CC0 ('CC-zero'), which enables owners of copyright-protected content to waive all of their copyrights in their works, thereby placing them "as completely as possible in the public domain, so that others may freely build upon, enhance and reuse the works for any purposes without restriction under copyright or database law."[15]

Using the four components, CC presents six different combinations of licences. However, even using this licensing scheme, some configurations of the licences would not usually be termed OER, since they do not allow the five freedoms discussed earlier. The six types of licences and CC0 are presented in a continuum of openness, which is visualised in Figure 10.

14 https://creativecommons.org/share-your-work/licensing-types-examples/
15 https://creativecommons.org/share-your-work/public-domain/cc0/

The licence combinations at the top of the chart (dark blue) allow the freedom to adapt content and so are fully in agreement with the OER definition. If they contain the stipulation 'SA', then the same licence must be used on any derivative materials. The open-licence combinations in the middle section (light green) contain the classification 'NC', meaning that the materials cannot be used for commercial products or services without an explicit request for reuse being granted by the licensor. Creative Commons have defined 'NC' expressly as 'not primarily intended for or directed towards commercial advantage or monetary expression', acknowledging that no activity is completely disconnected from commercial activity.[16] That said, the middle section licences are still OER compliant.

Figure 10: Aligning 'openness' to the Creative Commons licences



Source: adapted from Green (2017, p.37). Available under CC BY at https://www.ubiquitypress.com/site/chapters/10.5334/bbc.c/

The open-licence combinations in the bottom section (yellow – no derivative) would not normally be classed as OER, since they do not allow adaptation of a material without an explicit request for adaptation being granted by the creator. That is to say that these materials may be free at the point of access but do not allow the adaptation necessary to achieve the virtuous lifecycle of a true OER.

There is, however, an argument that even these types of licences can be viewed as a stepping stone towards better access to high-quality learning materials. For this reason, Mishra (2017) argues for taking a pragmatic view, in the short to medium term, about materials not allowing derivatives, since the ultimate goal of any OER-related initiative is to improve teaching and learning.

> ***While releasing an original work with any open licence does not pose a challenge, remixing brings in issues of licence compatibility.***

The most important argument, though, is that these types of materials do not support the collective adaptation and redevelopment of learning materials, which may be a key attribute necessary for an educational system to keep up-to-date with the dynamic of the digital world. OER can be revised and updated by anyone other than the copyright holder, with due attribution to the original. Moreover, this empowers teachers anywhere in the world – from a remote village in the Amazon to islands in the Pacific – to adapt the material for their own context, thereby taking their own decision on what to teach and how to teach to improve student learning.

Many enthusiasts of open-policy movements state that OER policy should specify a licence, especially the CC BY licence, to allow more freedom. However, this leads to many new challenges with respect to reusing and remixing available materials that have different licences. While releasing an original work with any open licence does not pose a challenge, remixing brings in issues of licence compatibility. These considerations should be weighed against each other when determining the OER policy's open licensing framework.

16 See the Creative Commons Wiki: https://wiki.creativecommons.org/wiki/NonCommercial_interpretation.

The importance of technical openness

For the virtuous cycle to occur, as depicted in Figure 7, licensing is a legal precondition, but technical openness is also important. This is largely about simplifying the process of adaptation and repurposing. A review of the key aspects of technical openness by Hilton, Wiley, Stein, and Johnson (2010) led to the suggestion of an 'ALMS Rubric' to classify the technical openness of a learning material. ALMS stands for: Access to editing tools; Level of expertise required to revise or remix; Meaningfully editable resource; and Source-file access. According to the ALMS Rubric, technical openness is facilitated when tools for editing the material are freely available, a material requires limited technical expertise to revise or remix, the material is fully editable, and access to the original source file is given. Note, however, that this is only applicable to OER available in digital format. For OER released in printed format, a digital file with technical openness may also be made available in a repository.

An additional design requirement for learning materials is to ensure they are accessible to all learners, as OER's objective is to be inclusive for all learners.

An additional design requirement for learning materials is to ensure they are accessible to all learners, as OER's objective is to be inclusive for all learners. Requirements for OER should therefore also consider the recommendations from the World Wide Web Consortium (W3C) concerning the Web Accessibility Initiative (WAI), which include ensuring the information is available in multiple formats and can be accessed independently of specific devices, and providing ways for users to pause and stop time-based content.[17]

Box 1.4: Some key resources introducing OER

The following resources give more detailed overviews of what OER are, what their worth, possible uses, and functions can be, and who are the key players in OER adoption.

- **A Basic Guide to Open Educational Resources** (UNESCO & COL joint publication)[18]
- **Understanding Open Educational Resources**[19]
- **Online Course:** Understanding Open Educational Resources (based on the above)[20]
- **7 Things You Should Know About Open Education Content**[21]

17 See the Framework for Accessible Specification of Technologies (FAST) at http://w3c.github.io/apa/fast/; in addition, UNESCO's guidelines on the inclusion of learners with disabilities in open and distance learning is a good source on this topic – see https://unesdoc.unesco.org/ark:/48223/pf0000244355.
18 http://oasis.col.org/handle/11599/36
19 http://oasis.col.org/handle/11599/1013
20 https://learnoer.col.org/
21 https://library.educause.edu/resources/2018/6/7-things-you-should-know-about-open-education-content

Phase 1: Sketching the policy design

This chapter has introduced the potential of OER for achieving Agenda 2030, specifically Sustainable Development Goal 4 on education. It has also described the importance of open licensing and technical openness if OER are to realise this potential. The task at the end of this chapter is to formulate a ***first sketch of the OER policy***, which will be elaborated and given more detail in the following chapters and planning phases. Such a sketch provides an orientation for the focus of the policy and for what expertise will be required in the policy-design process.

You are now encouraged to respond to the questions that follow, which will guide the strategy-development process.

Guiding questions:

1 **What are the major challenges or issues your education system is facing in achieving SDG 4? Based on your understanding of OER, how can adopting OER contribute to their solution?** Formulate a short paragraph explaining the expected challenges that will be at the centre of your OER policy. Include considerations of what expertise this policy will require (e.g., from which educational fields) and, therefore, who should be involved in the next steps of the policy-design process.

2 **The term 'open' in OER is about open licensing. Where and how could licensing regulations and practices for learning materials be changed to encourage the creation, use and sharing of OER?** Formulate a short paragraph describing OER use and any plans for reforming licensing regulations. Include considerations of whether these plans require additional legal expertise in the policy-design team.

3 **The term 'open' in OER also requires what is termed 'technical openness'. Where and how could technical openness be ensured for OER-based learning materials?** Formulate a short paragraph describing initial plans concerning technical openness. Include considerations of whether these plans require additional technical expertise in the policy-design team.

Chapter 2

Determining the OER policy vision

Overview

A policy is the expression of a concerted and planned effort to achieve specific goals through prioritising some practices and behaviours over others. This chapter starts out from the educational challenges to achieving SDG 4. It then examines the considerations or propositions for leveraging OER to address the challenges in teaching and learning processes, and to improve or even transform educational provision. These considerations are used to form the contours of the policy vision, which is at the core of the OER policy. Defining the value of OER within the local context will allow the policy-maker to formulate a clear vision for OER implementation in the future.

After reading and working through this chapter, you are expected to be able to:

- ***Situate the debate for OER in the context of access, quality and cost***
- ***Express the rationale for an OER policy***
- ***Define policy goals in your own context***

Policy as concerted action

A policy is the expression of a concerted and planned effort to achieve specific goals through prioritising specific means.[22] An education policy normally describe educational challenges and/or targets that are politically relevant and will be addressed by the policy (Evans & Cvitanovic, 2018). In the case of this publication, these educational challenges are related to the achievement of SDG 4, especially in relation to teaching and learning resources, as stated in Chapter 1.

The effective implementation of a policy requires the combined actions of multiple institutions and persons to achieve the desired outcomes. If these organizations or persons were only acting in self-interest, they would be unlikely to take these steps. For this reason, the policy will lay down regulations, set incentives and provide capacity-building activities to encourage and enable institutions and their members to implement the goals (Bemelmans-Videc, Rist, & Vedung, 1998).

Overarching and comprehensive policies are necessary to take reforms to scale and to integrate them into the 'normal' system, since any new reform requires existing prioritisation, administrative routines and decision-making structures to be reassessed and in many cases realigned to the new policy requirements.

In contrast to a policy, a strategy is usually understood as the plan of action taken up at the institutional level as a reaction to a new policy and to other changes in the institutional environment (Mintzberg, Ahlstrand, & Lampel, 2009). This lays down how the organization will react to the new policy to secure the expected outcomes set out in the policy within its own capacity and goal framework. Policy design should take account of the expected strategies of institutions and their members. This will be included in the consultation phase of the policy design (Chapter 6) and should be considered in the design of the monitoring and evaluation tools (Chapter 7).

Three perspectives in defining a policy vision

A policy vision must be placed in the present but also focused on the anticipated future. In other words, its purpose is to review unachieved previous goals while also taking account of new goals in education and expected changes to the current policy context. Mintzberg et al. (2009) differentiate between three sets of perspectives (Table 1), which should be anchored in a strategic vision, and this approach provides a good basis for developing an OER policy vision statement.

22 It should be noted that in the literature, there is no clear delineation line between 'policy' and 'strategy'. The definition and description used here focus on the fact that policy comes from 'politics' while 'strategy' comes from individual institutions. See also Mintzberg et al., 2009.

Table 1: Different perspectives for a policy vision

Perspective of the vision	Description of the perspective
Seeing ahead and seeing behind	This perspective aims to combine a view forward with a view behind, where the policy describes a future vision rooted in an understanding of the past.
Seeing down and seeing below	This perspective combines looking at the context of practice, regulations and behaviours from above, with an understanding of what really happens. In this way it is able to bring experiences of current practices together to generalise about what could be changed for the better (by a process of induction).
Seeing beside and seeing beyond	This refers to lateral thinking. It takes the creative approach of rethinking the current situation, how it can be improved and how policy challenges can be solved, and using the new solution to design a policy that will construct a new future after its successful implementation.

Defining the educational challenges or problems

The policy vision needs to plan how OER can be harnessed to address the educational challenges in achieving the SDG 4 presented in Chapter 1: expanding access, improving inclusion and equity, fostering gender equality, providing high-quality education and offering lifelong learning opportunities to all.

Various UNESCO documents have further specified the impact that can be expected from using OER.

> The ***Ljubljana Action Plan*** from the Second World OER Congress (UNESCO, 2017) states:
>
> 'If used effectively and supported by sound pedagogical practices, OER allow for the possibility to dramatically increase access to education through ICT, opening up opportunities to create and share a wider array of educational resources to accommodate a greater diversity of educator and learner needs. Increased online access to OER further promotes individualized study, which, when coupled with social networking and collaborative learning, fosters opportunities for pedagogical innovation and knowledge creation.'

> The ***Qingdao Declaration*** from the International Conference on Information and Communication Technology (ICT) and Post-2015 Education (UNESCO, 2015) emphasizes:
>
> 'Open Educational Resources (OER) provide education stakeholders with opportunities to improve the quality of, and expand access to, textbooks and other forms of learning content, to catalyze the innovative use of content, and to foster knowledge creation. We commit 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.'

The OER policy should therefore focus on points for action that are related to SDG 4 and to general educational challenges, and consider them in the context of the widespread use of OER (cf. Orr, Rimini, & van Damme, 2015).

Reducing barriers to learning opportunities for underserved groups

Participation in education is one of the most effective means of overcoming socio-economic barriers. However, access to education may be limited by several factors – poverty, rural settings, and a lack of flexible or appropriate delivery options. Freeing instruction from the constraints of time, place and pace through digital solutions has the potential to provide new learning opportunities for many. This policy could also reach out to lifelong learners who decide later in life to undertake formal training.

If this is the focus of the policy, OER should be used to provide new educational content to learners in a digital format that can be accessed online. Additionally, it will also be important to consider how learning acquired in a non-formal or informal setting through OER materials can be accredited and recognised for future formal learning pathways – for example, as practiced by the Saylor Academy[23] (Hilton et al., 2014).

Box 2.1: The example of the African Storybook initiative[24]

There are not enough books in African languages for effective early literacy development. Book shortages mean that too few African children learn to read well or enjoy it. This in turn means 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. Hence, the challenge is to develop 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 by developing an alternative way of using the Internet, ICT and OER to produce and deliver stories for early reading in languages familiar to African children (Welch & Glennie, 2016). Its website provides not only openly licensed stories for use but also tools for the translation and 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.

Reducing the costs of access to education

Teaching and learning materials are a considerable cost factor for both education providers and learners, and this cost may limit expansion of participation and access to good resources.

Teaching and learning materials are a considerable cost factor for both education providers and learners, and this cost may limit expansion of participation and access to good resources. With a finite budget, policy-makers must decide where to invest resources (e.g., in primary, secondary or tertiary education) and for which part of the population (e.g., for all pupils and students or only those from specific socio-economic backgrounds). This issue can inhibit the achievement of access to affordable and high-quality education called for in SDG 4. OER can lead to reduced costs for the development and maintenance of high-quality resources because of their ease of adaptability and reduced costs for end-users through digital sharing (see Box 2.1).

If this is the focus of the policy, OER should be particularly implemented to reduce the costs of providing learning materials on a large scale.

Box 2.2 presents some examples of how the issue of affordability has been connected to an OER-focused policy discussion in different countries.

23 https://www.saylor.org/
24 https://www.africanstorybook.org/

Box 2.2: Examples of using OER to reduce the cost of higher education

In the **United States of America**, OER activities have been most closely related to the debate on affordability. This debate is of general relevance to other countries and is mentioned as part of SDG 4.3: 'By 2030 ensure equal access for all women and men to affordable quality technical, vocational and tertiary education, including university' (United Nations, 2015).

The average college student reportedly spends between USD 600 (Consortium Florida Distance Learning, 2012) and USD 1,200 (Senack, 2014) a year on textbooks, and around two-thirds of students consider not buying the required textbook because of high costs (Consortium Florida Distance Learning, 2012; Senack, 2014). This is particularly significant for the community-college sector, as:

- Community colleges are generally seen as providing higher education for non-traditional and otherwise excluded student groups
- Learning at community colleges is particularly focused on the use of textbooks, so reducing the end consumer costs to students would have a particularly significant impact on affordability

In recognition of these issues, there is a growing body of literature in the USA investigating the savings incurred by students when they are able to opt for licence-free, open textbooks that cost students nothing to access and use (Allen, 2010; Senack, 2014). Hilton et al. (2013) provide evidence for the cost effectiveness of mathematics open textbooks in a community college, with findings showing that open textbooks allowed for substantial cost savings to students, while faculty members were generally satisfied with the quality of materials. In the state of Virginia, the state government initiated a project that provided zero-cost textbooks for use in the state's community-college sector.

Affordability of textbooks is a big challenge in higher education in **Bangladesh** too. Students spend on average BDT 1,850 (about USD 22) per year on textbooks, which is over BDT 258 million (about USD 3.04 million) annually for all students in all colleges and universities. Furthermore, government money is spent again and again on creating similar educational resources because these are not shared. A 2017 study indicated that limited access to educational resources significantly hurts student grades and influences their decisions when selecting a discipline of study. In addition, the current mode of access to educational resources is not legally acceptable, and students are forced to use resources at the risk of copyright infringement. Bangladesh could reap important benefits in terms of efficiency, access and quality if OER are endorsed in its education system. The marginal cost of educational resources will be very low, and students will have almost free access to educational resources. As OER are flexible to edit and customise, teachers will be able to adopt available OER to create new resources for students in Bangladesh. OER will be helpful in narrowing the quality and access gaps in education, which in turn will help ensure that the country achieves SDG 4 (COL, 2017b).

Malaysian higher education is in a similar situation. Students spend about six per cent of the total cost of their education on textbooks, and parents spend fifty-five per cent of their income on the education of a child. A survey conducted in 2017 shows that about a quarter of students in higher education did not have access to textbooks during their studies because they are too expensive. More than twenty per cent of the respondents indicated that the cost of textbooks impacted their decision about what discipline they would study. Annually, total expenses for students in higher education equal MYR 234,871,160 (about USD 57.8 million). Considering the potential of OER, the private cost of education could be substantially reduced by endorsing OER in education (COL, 2017c).

Improving the relevance of learning content to individual needs

In the past, the rigidity of learning contexts has led to standardised learning resources (e.g., in the form of printed textbooks). A more dynamic learning context is necessary to achieve the SDG 4 goals of improving inclusion and equity for all parts of the population, including disadvantaged and disabled children, and fostering gender-sensitive policies to eliminate gender-based discrimination within schools and the wider education system. OER enable instructional designers and experts to collaborate to design up-to-date and adaptable learning content. But they can also involve learners in the development of their own learning materials and encourage learners to support each other through collaboration and peer work. This is especially relevant in connection with the need to develop media literacy but also for experimenting with ways of working, which will become more common in future labour markets (Working Group on Education, 2017, p. 22ff.).

OER enable instructional designers and experts to collaborate to design up-to-date and adaptable learning content.

If this is the focus of the policy, OER should be particularly implemented as a way of creating new and up-to-date, adaptable learning content. It will also be necessary to include capacity building for teachers, who will be expected to change their teaching and learning practices to make full use of these new learning materials.

Providing multilingual and localized content

Good-quality learning content is often only available in a few languages and seldom in the least used languages. Furthermore, it may be written using examples that are not relevant to a particular local context. These factors inhibit linguistic and cultural access to learning materials (Jimes, Weiss, & Keep, 2013). OER can open this process by enabling teachers and instructors to adapt content and to work collaboratively to provide content in local languages.

If this is the focus of the policy, existing OER learning materials will be adapted by teachers and instructors for their own context. This process should be supported by capacity-building exercises to engage teachers in undertaking it.

Adult literacy and gender sensitivity

Adult literacy can be improved by providing more affordable, more accessible learning opportunities that include a didactic focus, which makes what they learn appear relevant to the learners themselves. OER can make contributions to achieving these, as sketched above. In the case of gender sensitivity, improved accessibility may help underserved genders (in the main, women) to access high-quality learning. The adaptability of learning materials means that any materials displaying gender bias can be changed or removed in the remixing of the original piece of content.

The decision about how important each of these policy challenges is to the whole policy vision and which to include in the final OER policy should be based on two broad considerations:

- What is the main challenge that the policy hopes to solve (or contribute to solving)?
- How significant is this challenge in comparison to other problems in the current political environment?

This approach recognises that there will always be competing agendas and that it is important to decide which challenge is the priority to solve. A judgement on the current significance of any of these challenges at a certain point in time and in a certain location (since from a general standpoint, they are all relevant and important) can be based on the responses to four further questions:

- How drastic and urgent is solving the problem?
- Which of the problems is most holding back the education system?
- Is there a clear and evident way to solve this problem?
- How likely is it that this solution will be accepted by politicians and educational leaders and can be implemented at the institutional level?

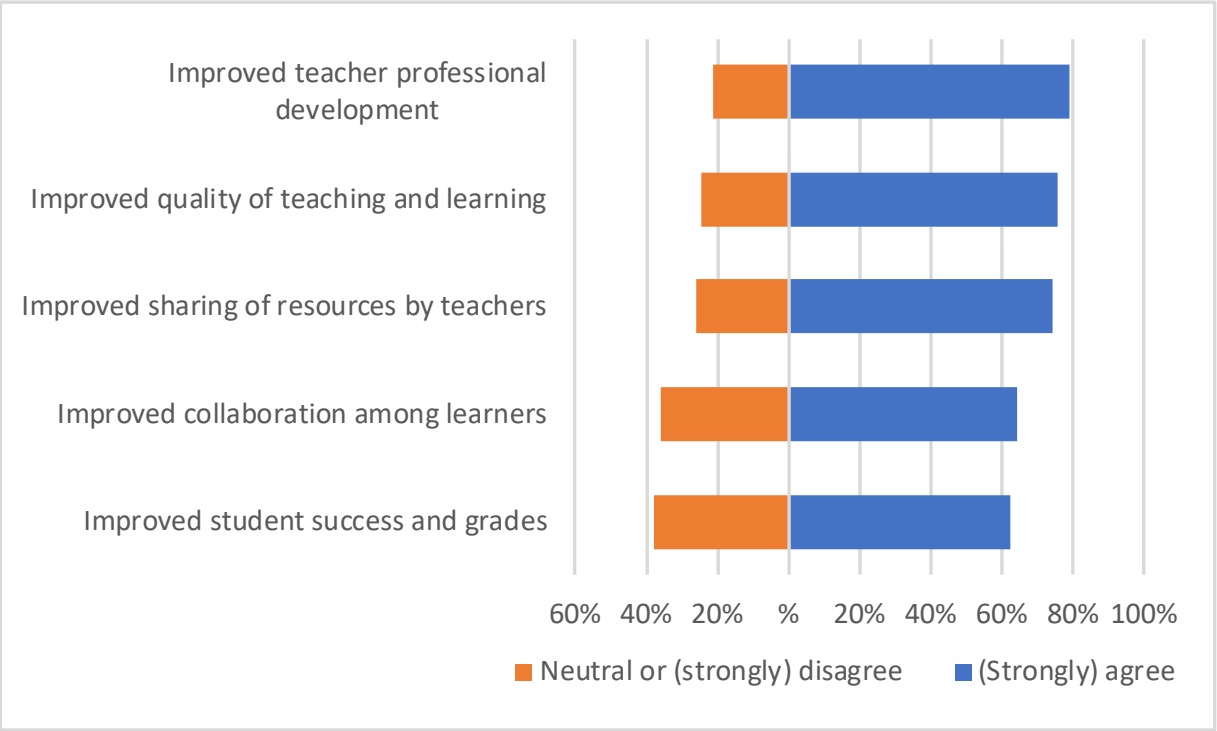
Solutions to those problems considered significant in this sense should be prioritised in the policy vision.

Defining the extent to which OER innovate teaching and learning

OER constitute a medium or instrument to facilitate improvements and innovations in teaching and learning. The COL global survey on the engagement and impact of OER has shown that governments particularly expect OER to influence teaching, learning and professional development (COL, 2017b). Asked where OER has had an influence on the education process, most respondents agreed to the statement that the use of OER had influenced teacher professional development to a large extent (seventy-nine per cent), improved the quality of teaching and learning (seventy-six per cent) and helped improve the sharing of resources among teachers (seventy-four per cent).[25]

As can be seen from Figure 11, most respondents were either strongly agreed or agreed that OER played a role in improved student success. This means that OER can have an influence here (and there is evidence that they do [Emarge Ed. Consultants, 2017; cf. Robinson, Fischer, Wiley, & Hilton, 2014]). However, increasing learning success involves a more complex change to the learning environment than simply implementing OER. This will be discussed in the section below.

Figure 11: Where OER have had the most influence: proportions of respondents by assessment



Data source: COL (2017a).

Indeed, the integration of OER into the teaching and learning environment can be either loose or tight (Kerres & Heinen, 2015; Weller, 2010), where tight integration is likely to be more transformative for the whole teaching and learning process.

- *Loose integration* will see OER as add-ons to existing learning settings. These may take the form of videos, 3-D models, or quizzes to enhance the original learning setting.
- *Tight integration* follows the argument that the goal of OER should be to enable a learning that was previously not possible. It involves fully integrating OER into the complete learning ecosystem and is often accompanied by changes in the whole teaching and learning processes, which become more open too (Andrade et al., 2011; Green et al., 2018; Hegarty, 2015).

25 It should be noted that around one-fifth of participants did not respond to this question, but the percentages have been calculated without this group.

There is a strong argument that OER-based practice should always aim to fully transform the teaching and learning situation (Wiley, 2015). Table 2 describes the practical options and their consequences, which should be considered for the policy vision. This decision leads to the requirements for the design of the policy masterplan (see Chapter 5).

Table 2: Four objectives for the use of OER within the teaching and learning setting

Process	Objective for using OER	Enablers
Substitution	Replaces similar learning material allowing for the same functionalities.	Regulations must allow existing materials to be replaced by OER. This may require the review and modification of quality assurance measures.
Augmentation	Constitutes an improvement in terms of previous learning materials' coverage, how up-to-date it is and how accessible	
Modification	Enables a substantial learning activity redesign – e.g., encouraging more levels of teacher–learner and learner–learner interaction compared to the previous learning material.	OER are used as part of a whole process of teaching and learning to transform education. The OER encourage and enable this by facilitating collaboration between teachers to provide better materials, by encouraging collaboration between teachers and learners using the materials and by increasing the relevance of the materials to the context where learning is taking place. The process is also likely to require significant capacity-building exercises for teachers and instructors.
Redefinition	Facilitates new forms of learning that were unavailable within the previous teaching and learning configuration; redefines the pedagogical approach – e.g., with learners becoming co-producers and content integrating more authentic situations.	

Defining how OER can help respond to emerging challenges

The previous sections provide perspectives on how OER can help address lasting educational challenges and innovate teaching and learning systems based on current deficits. In the twenty-first century, additional challenges for education emerge from the increasingly digital and global world around us.

Digitalisation creates new challenges for economies, and benefiting from it requires new infrastructure, new organizational structures and new skills. Without concerted and focused action, the digital divide between the Global North and South and between different groups in society will remain a matter of fact, and the risk remains for the time being that the gap will widen (Hess et al., 2016). Reducing or even closing the digital gap requires more engagement and dynamism in terms of technological infrastructure, as well as access to high-quality, up-to-date learning opportunities and long-term engagement, since there are few 'quick fixes'.

At least three challenges will become increasingly significant as digitalisation and globalisation processes continue:

- **Fostering the use of new forms of learning for the twenty-first century:** The twenty-first century will increasingly emphasise the importance of certain skill sets over others. In a digital world, people need to develop media and digital literacy, which enables them to fully harness the benefits of increased access to knowledge, collaboration and networking, while being aware of the disadvantages of the increased distribution of unqualified

and inaccurate information, hate speech and threats to data privacy. Developing skills in these areas is important for success on the job market and in daily life (Center for American Progress, 2012; Fadel, Bialik, & Trilling, 2015; Working Group on Education, 2017, p. 22ff.). Utilising OER in schools and other educational settings offers learners the chance to review, evaluate and modify existing information materials in the protected environment. They can learn what it is to produce and distribute knowledge.

Incorporating this in the policy requires an ambitious vision for transforming education that includes flanking reforms to the teaching and learning environment, which are catalysed and supported by the use of OER (Orr et al., 2015).

- **Fostering teachers' professional development and engagement:** Teachers are increasingly expected to provide more learner-centred forms of instruction using digital technology. However, enabling teachers to provide students with adequate competencies for coping with a fast-changing world has become a major challenge for education systems (Schleicher, 2012). Whilst routine, rule-based, compartmentalised knowledge is easiest to teach, it has become less relevant to the skills and competencies required of citizens in the twenty-first century. OER can support the professional development of teachers and instructors by offering them adaptable educational resources, which they can revise and adjust to provide a better fit with the environment where they are working, and where adaptation can be part of the learning process. This process of revision and adaptation can be achieved through collaboration and networking with other teachers and instructors, increasing the value of their professional network.

  Including this in the policy requires an ambitious vision for transforming education through building capacity and supporting teachers in practice and in training programmes.

- **Harnessing the benefits of an interconnected world:** In an increasingly globalised world, even national education mandates have a global relevance, and many countries are dealing with the same challenges at the same time. Globalisation means that education is one of the key resources for economic success along the global value chain, and countries need to improve their education systems to compete in global markets (Hanushek & Woessmann, 2015). Globalisation also enhances the chances of collaborating and working together (Benkler, 2006). OER are learning resources that naturally encourage both national and international collaboration between subject-experts and policy-makers to provide the best learning materials and to improve educational performance. They allow countries to adopt high-quality resources developed in other countries or in other languages and adapt them to their own setting. In this way, they are a means of benefiting from the interconnected world. This is a main impetus behind UNESCO's promotion of OER and the Ljubljana Action Plan on OER (UNESCO, 2017).

  Including this in the policy requires considering how this process can be harnessed through the international collaboration of teams at the subject level and policy level.

Phase 2: Formulating a vision statement on leveraging OER to achieve SDG 4

In a vision statement, the desired and expected changes in the educational sector (outcomes) are brought into relation with the expectations for the use of OER as an instrument of change. This chapter has formulated three key considerations, which should be expressed in the ***vision statement*** for the OER policy. These are: choosing the operational goals related to achieving SDG 4, deciding on how OER will be integrated into current educational practices, and formulating a vision that has a foundation in the current context and is forward looking as well. The task at the end of this chapter is to formulate a clear and concise vision statement that provides the core for all further planning phases.

You are now encouraged to respond to the questions that follow, which will guide the strategy-development process.

Guiding questions:

1 Which of the following policy challenges will be key to achieving SDG 4 in this policy?

This chapter has described five clear goals and sketched the consequences of each of these goals for an OER policy. Choose no more than three, and explain why these are so important for achieving SDG 4 in your own context – i.e., relate them to specific challenges in your educational system and your society and to the guiding principles formulated in the previous section.

Choose from the list provided earlier in the chapter: reducing costs of access; improving the relevance of learning content to individual needs; reducing barriers to learning opportunities for underserved groups; providing multilingual and localised content; adult literacy and gender sensitivity as cross-cutting issues; skills development responding to the changing world and the future of learning. Add further issues related to your own context and society, but link these to the goals of SDG 4 expressed in this chapter and Chapter 1.

2 How can OER contribute to achieving these goals?

This chapter has shown that OER can be used as additional and augmented learning materials and to transform education. Particularly in the latter case, this requires the OER policy to include reforms to administrative and regulative processes, and capacity-building exercises to ensure that the goals will be met. Describe below how OER will be used to make such changes happen. For instance, is the OER policy broadly focused on providing new learning materials, or does it aim to be a catalyst for wider pedagogical change? Explain this vision in simple statements.

3 How does the policy relate to the current context and respond to the emerging challenges?

As described in this chapter, a policy must be grounded in the present and link to the future. The policy vision should therefore include a passage linking the future vision to current practices, and make initial assertions about the short- and long-term expectations for the policy and any expected barriers that need to be overcome.

Chapter 3

Framing the OER policy

Overview

OER hold great promise. However, as with all other instruments of reform and improvement, the potential of OER can only be effectively leveraged with smart, integrated and focused policies and strategies. While the policy vision should be concise and ambitious, the achievement of the vision will depend on whether the scope, scale and regulatory authority of the policy are well framed. This chapter provides a matrix to guide decisions on scope and scale and discusses policy choices in relation to the possible requirements for regulations and other implementation instruments.

After reading and working through this chapter, you are expected to be able to:

- ***Describe the different scopes and approaches to OER policy***
- ***Choose the suitable scopes for your own context***
- ***Align the OER policy to the broader regulatory environment in your own country***

Taking an integrated approach to policy on OER

OER have been recognized around the world as a key means to enable fairer, more inclusive and equitable access to knowledge and learning. In many parts of the world, people and organizations are producing and reusing OER. Over the last fifteen years, project activities on OER have proven useful, and this has reinforced the call for them to enter the educational system as a mainstream (i.e., common) element of all educational practice.

The Ljubljana Action Plan from the Second World OER Congress states:

> OER are a strategic opportunity to improve knowledge sharing, capacity building and universal access to quality learning and teaching resources. (UNESCO, 2017b)

The Qingdao Declaration states:

> We commit to developing sector-wide strategies and capacity building programmes to fully realize the potential of OERs to expand access to lifelong learning opportunities and achieve quality education. (UNESCO, 2015)

The OER World Map[26] currently has over 3,000 entries on OER-related activities, organizations and champions from across the globe. However, as with all other instruments of reform and improvement, the potential of OER can only be effectively leveraged with smart, integrated and focused policies and strategies. Looking at various innovative projects within the European Union, the Joint Research Centre has judged many to be '[s]mall scale, innovative projects but with little systemic impact, often not continued beyond pilot or funding schemes, without any scientific evaluation on outcomes, effectiveness and efficiency' (Punie, Kampylis, & Vuorikari, 2013).

Overarching and comprehensive policies are necessary to take reforms to scale and to integrate them into the 'normal' system, since any new reform requires existing prioritization, administrative routines and decision-making structures to be reassessed and in many cases realigned to the new reform. That is the purpose of a policy, whether it be at the national or institutional level.

A global survey of OER carried out by COL found that forty-nine per cent of responding countries make reference to OER in a government or state/regional educational strategy/plan or similar document, and sixty per cent say their country is at least contemplating policy development (COL, 2017a). A policy must be accompanied by key components that encourage the use of OER. With reference to Rogers' diffusion of innovation curve (Rogers, 2003), an evaluation of OER policy and practice in the USA carried out by Boston Consulting for The William and Flora Hewlett Foundation stated that an adoption rate of one-fifth in standard instructional practice would be necessary to encourage others to utilize OER in their own practices (Boston Consulting Group & The William and Flora Hewlett Foundation, 2013; Centola, Becker, Brackbill, & Baronchelli, 2018; cf. Rogers, 1995).

To develop a cohesive and comprehensive policy, there must be discussion on several strategic considerations that will constitute the framework of the policy.

To develop a cohesive and comprehensive policy, there must be discussion on several strategic considerations that will constitute the framework of the policy.

The first consideration is the scope and scale around which the policy should be framed. Is it focused largely on the whole education system or specific sectors, and does it start at the institutional or the national level? A second consideration is whether the policy will regulate or persuade those people expected to be the change agents – i.e., will it enforce

26 See https://oerworldmap.org/.

or encourage behaviours? Using these dimensions, the policy-maker will be able to lay down a framework for the policy. This can then be compared to the current policy landscape and practical environment in which this policy should be realized as part of the gap analysis (see Chapter 4).

Setting the scope and scale of the OER policy

A policy must be set within a social and institutional context and must be designed with a clear link to the purpose of OER. This 'entry point' for a policy must be fixed early on and used to determine which educational sectors and institutional levels will be included in the policy framework as well as how the policy-triggered programme will respond to the policy problems defined in the OER policy vision (see Chapter 2).

Table 3 provides a matrix of some of the key options for designing a policy. In terms of scale, they may be small projects, which might pilot a concept that could be later rolled out, or they could be initiatives at the institutional or national level. In terms of scope, they might cover only a specific educational sector, or they might be sector-wide, covering various sectors to achieve wide-scale adoption and use of OER across the whole educational system. Such sector-wide policies may focus on a particular theme, such as supporting curriculum adjustment or development, promoting the innovative use of ICT in education, enhancing teacher education, strengthening literacy education and/or non-formal learning, or promoting lifelong learning for all.

Table 3: Matrix with options for scope and scale of OER policies

Scale / Scope		Projects / Pilots / Experiments	Institutional policy	National policy
Specific sector	General school education (ISCED 0, 1, 24, 34)			
	Technical and vocational education (ISCED 25, 35)			
	Tertiary education (ISCED 5, 6, 7, 8)			
	Non-formal education and training			
Thematic areas	Curriculum adjustment or development			
	ICT in education			
	Teacher professional development			
	Lifelong learning			

Note: ISCED[27] is the International Standard Classification of Education, maintained by UNESCO.

27 http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf

Table 4 provides some statistics from COL's global survey on OER initiatives (COL, 2017a). It highlights the three main types of engagement, the assumptions behind such an approach and what characteristics a policy will typically have in this context. In an additional analysis, the survey found that most OER initiatives in the Middle East and North Africa are from government, while those in North America, Europe, Africa and Asia are mainly bottom-up initiatives driven by institutions or individuals. In the Latin America and the Caribbean region, donor-funded projects are particularly significant. At the same time, as shown by the statistics, nearly all countries that responded to the survey had at least some specific programmes or projects supporting OER.

Table 4: Types of engagement in OER policy development

Type of engagement in national OER policy	Percentage of countries engaged	Assumptions behind the approach	Typical characteristics of policy
Through initiatives by institutions and engaged individuals	50%	This can be termed the grass-roots approach. It is likely to be OER focused and small-scale. A group or community is active in this area.	On this level, the policy activity will be low. It may be indirectly active in allowing certain activities or behaviours.
Through specific projects or thematic programmes (with public, donor or private spending)	96%	This is a medium-scale approach. The programme may be focused on OER or have a greater scope, but it indirectly supports the use of OER.	The condition of funding is the production, use, sharing and/or adaptation of OER (or openly licensed materials) – i.e., the policy rewards certain activities. This may be the first step in taking an OER-related initiative to scale if it proves viable and useful through the programme.
Through government initiatives, including specific measures and incentives	35%	This is a large-scale approach and so is likely to set OER in the larger context of educational issues or digitalization. The OER element may be more or less relevant to reaching the overall policy goals.	Such a large-scale approach will make full use of all three policy instruments (regulation, funding and information); regulation change may be necessary or a result of success in an initial phase.

Data source: statistics adapted from COL (2017b., p.16-18).

Framing the scale of policies

In cases of ***pilot-based policy***, the policy development starts on a smaller scale with piloting and then uses this to understand the inhibiting regulatory and behavioural factors that should, in a second phase, be removed or limited to enable the initiative to go to scale. An example of this can be found currently in Germany. The German system has been experimenting with the value of OER through promoting projects and pilots (Orr, Neumann, & Muuß-Merholz, 2017). It is assumed that success with these pilots could lead to adjustments to the policy framework to provide greater integration of OER into the education system.

Policies at the ***institutional level*** are likely to be more closely related to the overall institutional strategy of the respective institution. The University of South Africa (UNISA) has established an OER strategy as part of a broader Open UNISA strategy (De Hart, Chetty, & Archer, 2015). Similarly, the University of Edinburgh (Scotland), the University of Louvain (Belgium) and the Delft University of Technology (The Netherlands) have overall open policies, which cover open licensing, open education and OER, and open research. The Southern Alberta Institute of Technology (SAIT) in Calgary, Canada has adopted an institutional OER policy with a primary focus on the affordability of materials as part of SAIT's 2017–2020 Applied Education Plan.[28]

28 http://www.sait.ca/Documents/About%20SAIT/Administration/Policies%20and%20Procedures/AC.2.21.1%20Open%20Educational%20Resources.pdf

Box 3.1 suggests tools for developing institutional strategies.

Box 3.1: Institutional tools and guidelines

1. COL's 'Institutional OER Policy Template'[29] provides a ready-to-use template for drafting an institutional OER policy. Spanish and Tamil versions are also available.
2. 'The College and University OER Policy Development Tool', created by Lumen Learning[30], is for college and university governance officials, as well as individuals who have responsibility for developing institutional policy, to promote the utilization of OER and scale efforts to achieve full OER programs. It is also available as a web-based tool.
3. The Feasibility Protocol[31] is an instrument for the executive management of higher education institutions, providing guidance in making informed decisions about institutional adoption of OER (Bossu, Brown, & Bull, 2013).

Policies can be ***inter-institutional and large-scale*** even if they are not national. One example that grew out of an institutional initiative is the OER degree. Tidewater Community College was the first to develop an entire associate degree pathway, called a Z-Degree, that can be achieved by taking courses available as OER materials. One of the outcomes is that students can use their cost savings for a number of things, including taking more courses (Wiley, Williams, Demarte, & Hilton, 2016). OER degrees have subsequently emerged in at least thirty-eight community colleges in thirteen states with the launch of the OER Degree Initiative, by Achieving the Dream, a community college reform network.[32] The OER Degree Initiative seeks to boost college access and completion, particularly for underserved students, by engaging faculty in the redesign of courses and degree programmes through the replacement of proprietary textbooks with OER. The short-term goal is to reduce costs for students and accelerate their progress through college, but an important secondary impact is to change the culture of institutions so that they create systems and structures for better connecting curriculum and pedagogy to updated student learning outcomes.

Another example is the Community College Consortium for Open Educational Resources[33] (CCCOER), with members in twenty-seven US states and two Canadian provinces. It was founded ten years ago to expand the awareness and adoption of open educational policies, practices and resources. CCCOER's mission is to promote the adoption of open education to enhance teaching and learning at community and technical colleges. Its vision is that students should have equal access to high-quality instructional materials to achieve their academic goals. As a community of practice for open education, it provides resources, support and opportunities for collaboration in learning, planning and implementing successful open educational programmes with its member community and technical colleges.

National-level policies are likely to go beyond a simple focus on OER. In India, the National Mission on Education through ICTs[34] (NME-ICT) is a national programme supported by the Ministry of Human Resources Development. It has an open-licence policy[35] for all the projects' supported outputs. As a result, the National Programme on Technology Enhanced Learning[36] (NPTEL), which is a collaborative project offered by the Indian Institutes of Technology and the Indian Institutes of Science, offers many courses in the STEM subject areas (science, technology, engineering and maths) as OER.

In Canada, education is a provincial responsibility, and there is no federal government strategy to support OER. However, the provinces of British Columbia, Alberta and Saskatchewan have developed high-level intersectoral policies for their provinces and a common memorandum for exchange between the provinces.[37] All of these provinces have taken a similar approach to coordination and implementation by giving this work to third-party bodies, such as eCampusOntario or BCcampus. At the institutional level, BCcampus is the most active collaborative Canadian organization in OER and the leader in Canada in promoting their use.

In Fiji, the national policy has to take account of the different mandates central government has in different educational sectors. The national policy for Fiji includes all schools directly under the remit of the national Ministry of Education,

29 http://oasis.col.org/handle/11599/2361
30 http://policy.lumenlearning.com/
31 https://eprints.usq.edu.au/24303/7/Busso_Brown_Bull_rep2013_PV.pdf
32 http://www.achievingthedream.org/press_release/15982/achieving-the-dream-launches-major-national-initiative-to-help-38-community-colleges-in-13-states-develop-new-degree-programs-using-open-educational-resources
33 https://www.cccoer.org/about/about-cccoer/
34 http://mhrd.gov.in/technology-enabled-learning-0
35 http://www.sakshat.ac.in/Document/OER_Policy.pdf
36 https://nptel.ac.in/
37 https://oerknowledgecloud.org/content/memorandum-understanding-open-educational-resources

requires the Higher Education Commission to coordinate the work with tertiary education providers and includes the expectation that all other educational institutions outside the direct mandate of the ministry will follow the public role models (see Box 3.2).

Box 3.2: Example of a multi-sector national OER policy: Fiji

Fiji recognizes the potential for OER to play a major role in expanding equal opportunities to access quality education and to contribute in a significant way towards the development of a smarter Fiji (Ministry of Education, Heritage and Arts [Fiji], 2016). This is due to OER's ability to provide free and adaptable learning and teaching materials. OER allow the adaptation or adoption of existing learning and teaching materials, avoid duplication of efforts and promote the innovative use of resources in different pedagogical contexts.

The Ministry of Education has published a legal document in which the need for relevant policies and effective implementation strategies for OER is stressed and a policy is formulated, aimed at making educational resources freely available for reuse and repurposing through the use of open licences. The Creative Commons licence is the preferred form of open licence. The OER policy recognizes its place within or alongside the ICT in Education Policy of the Ministry of Education to ensure wider acceptance and use of OER as an educational tool.

The implementation of the OER policy within the public and private sector is undertaken in the following ways:

- All educational institutions, from early childhood centres to secondary schools, whether private or public, shall, under the Ministry of Education, develop OER policies, guidelines and procedures as appropriate that are relevant to their organizations and that are consistent with this policy.
- At the tertiary level, the Fiji Higher Education Commission shall facilitate the implementation of OER while working closely with individual institutions.
- All other government-funded or non-government and private institutions or agencies operating in Fiji shall develop their own policies and procedures in OER that are relevant to their organizations and are consistent with this policy.

There are also ***international OER policies***, which are adopted and then linked to national initiatives. These might be collaborative initiatives of institutions and individuals in certain areas with common issues such as lacking access to local language-based digital content – as is the case with the African Storybook initiative, which was initially funded by a UK-based donor.[38] There might also be policies from international organizations that start with a focus on overall societal problems, leaving national authorities to decide what scope their response will have. This is the case of UNESCO and its work on OER to promote the achievement of the Sustainable Development Goals. COL has had an OER policy since 2011.[39]

Delineating the scope of policies

The question of scope relates to which areas of the education system the policy should apply to: only specific educational sectors or sector-wide, covering various sectors to achieve the wide-scale adoption and use of OER across the whole educational system. Such sector-wide policies may focus on a particular theme, such as ICT in education, strengthening non-formal and informal learning, or promoting lifelong learning for all.

The decision to focus a policy on a particular sector or multiple sectors may be determined on the basis of at least two criteria:

- The fact that a particular problem is ***most urgent in a specific sector***. An example could be that changes to the school criteria require new learning materials that address this curricular challenge. This was one of the stimuli for the Polish Digital Book Initiative (Sliwowski & Grodecka, 2013). Many developing countries appear to be embedding OER in their national strategies to improve the quality and relevance of their technical and vocational education and training (TVET) systems (Ehlers, Schuwer, & Janssen, 2018).
- The fact that the implementing authority has ***different mandates for different educational sectors*** and can only enforce a policy in some sectors of the educational system. For instance, in many countries, the school system is directly controlled by government (at least the public part of it), while the tertiary education systems are only regulated by the government, so the latter can only be encouraged to act in certain ways.

38 https://africanstorybook.org/
39 https://www.col.org/programmes/our-strategy/cols-policy-open-educational-resources

Policies with a thematic focus may also crosscut all relevant sectors.

The adoption of OER in the USA – a pioneering region in this field – has been focused on using OER to solve the ***affordability problem*** in the community college sector and universities. In this case, it can be argued that the predominant concentration has been on OER and how they can change educational provision (cf. Griffiths et al., 2017).

The Mongolian system has started out from an ***ICT strategy*** and placed supporting OER within this strategy (Zagdragchaa & Trotter, 2017). The Fiji policy is closely aligned with the ICT strategy (Ministry of Education, Heritage and Arts [Fiji], 2016). This is the same for the ICT in School Education policy of the Indian Government (Ministry of Human Resource Development [India], 2012).

By contrast, Slovenia started with a government policy focused on an '***open by default***' approach to the whole of education provision, which included promoting the use of OER (Inamorato dos Santos, 2017, p. 21ff). Similarly, Chile used its commitments to the Open Government Partnership to link with a special initiative to provide a 'Citizen's Training Plan' (Plan de Formación Ciudadana), which uses OER to help citizens 'assume a responsible life in a free society and give orientation towards the integral improvement of the human person, as the foundation of the democratic system, social justice and progress, with emphasis on the use of digital technologies.'[40]

In the Kingdom of Bahrain, the 2030 Vision of its education sector strategy is to provide equitable and inclusive quality education and lifelong learning for all (Miao et al., 2016, p. 27ff.). This wide-scale policy has various components, including the Ministry of Education Strategic Plan 2015–2018 and The Strategic Plan for ICT. The OER policy is aligned to these two policies and the common goal of providing lifelong learning for all. Initially, the OER policy was focused on the school sector, but it has since been expanded following lessons learned in the initial phases.

Making an initial decision on the enabling regulations of the policy

The scope and scale of a policy lead to different requirements of and possibilities for using regulations to enforce conducive action. While in Chapter 6 we will discuss in depth how to create a policy that enforces, enables and encourages certain behaviour, it is important to make a general decision about what level of regulation is required within the policy framework at an early stage of policy development, since this decision has implications for the type of endorsement needed at the policy level (i.e., high-level regulation requires high-level endorsement), and for the question of how long the policy needs between design and implementation (i.e., it takes longer to design and implement a law than a funding programme).

For a ***national policy***, regulation is the traditional means by which a government imposes change – essentially, it sets a framework in which decisions and behaviours can be made (are legitimate) by actors (individuals and organizations) and imposes legal conditions on actions on the development and use of educational materials with public funds. A national policy can set regulations for the use of open licensing in procured learning materials and for the use of OER as learning materials in schools, and it can include the frequency and depth of use of OER as criteria for staff appraisals. A limit to this means of policy implementation is that it requires adequate authority for such an imposition, which in practice must be accepted by all the involved actors. In many countries, top-down imposition by regulation is only possible in the schooling sector, where it falls under the mandate of the national ministry of education. It is generally more difficult to impose such regulations for educational providers in the private sector, who tend to have more autonomy. In these cases, there are two other means by which policy can be implemented: through providing additional resources, which reward certain behaviours and sanction others (thereby enabling), and through providing information, which encourages certain actions and behaviours through persuasion (Bemelmans-Videc, Rist, & Vedung, 1998; see also Chapter 6). An overarching national policy also provides the much-needed governance structure to implement the policy, especially by defining responsibilities and accountabilities, and by allocating appropriate resources and monitoring and evaluating the corresponding progress and impacts.

For an ***institutional policy*** (e.g., at universities or colleges), there may be ways to regulate the actions of staff through

40 See https://www.opengovpartnership.org/members/chile/commitments/CL0036/.

employment contracts or performance contracts. In both cases, open licensing can be applied to learning materials generated by staff, provided it does not contradict national legislation in this matter. Furthermore, regulations can be implemented that set the use of OER as an expected part of the contract. Quality assurance procedures might also determine that all courses must include the use of learning materials that are OER. This would encourage members of the institution to search for existing OER and to adapt them to their own purposes. In all of these cases, additional encouragement and support can be offered through flanking measures that reward, inform and support teachers in their use of OER. Governance in relation to an institutional policy is more focused to ensure quality assurance of OER and facilitate the systematic adoption of OER.

At the ***project level***, the creation or use of OER can be regulated through the terms of reference. If the project is not focused on OER but has a thematic focus, the creation of OER can be encouraged through regulating open licensing for the project's outputs. This method was used for a national funding programme in the USA entitled Trade Adjustment Assistance Community College and Career Training – see Box 3.3.

Box 3.3: Example of an enabling regulation – the Trade Adjustment Assistance Community College and Career Training[41] (TAACCCT) grant programme in the USA

The TAACCCT programme is meant to increase the ability of US community colleges to address the challenges of today's workforce. Grants are provided to assist workers adversely affected by trade agreements in industry sectors facing problems, as well as a broad range of other adults. Every US state received funding during 2011–2014 through 256 grants totalling USD 1.9 billion. TAACCCT grants, which continue through September 2018, are impacting sixty per cent of the nation's publicly funded community colleges and building industry-aligned programs in manufacturing, health care, information technology, energy, transportation and other industries. To ensure that the federal investment of these funds has as broad an impact as possible, and to encourage innovation in the development of new learning materials as a condition of the receipt of a TAACCCT grant, the grantee is required to license to the public all work created with the support of the grant under a Creative Commons Attribution 4.0 (CC BY) licence. Work that must be licensed under the CC BY includes both new content created with the grant funds and modifications made to pre-existing, grantee-owned content using grant funds.

A by-product of the TAACCT programme has been a free and open online library of workforce training materials.[42] This repository contains free and open learning materials and programme support materials for job-driven workforce development, created by colleges and other educational institutions. In September 2017, the total number of hits was 897,343, of which 630,861 were file downloads.

At the international level, the opportunities for regulation also stretch between enforcement and encouragement through facilitative actions. The UNESCO OER declaration of 2012 and the Ljubljana Action Plan are two initiatives focused on ensuring that OER are visible at the national and international levels as enablers for achieving the SDGs (see Chapter 1). At the time of writing this publication, UNESCO was pursuing the option of a recommendation for OER agreed by the UNESCO General Conference (UNESCO, 2017a). This wouldn't mandate member countries to change their national legislation but would invite them to do so based on the principles and norms expressed in the recommendation. Part of this process is likely to result in standardised international monitoring of OER practices and impacts on a national level.

41 https://doleta.gov/taaccct/
42 https://www.skillscommons.org/

Specifying the policy alignment

The scope and scale of the OER policy may itself be aligned to other existing policies. Besides a standalone OER policy, OER might be a component of an ICT in education policy or more broadly an education policy and/or within a lifelong learning policy. It could also be part of the development of open licensing frameworks for many areas (publications, data, software, etc.) in connection with general challenges in education or as a part of the overall response of a country or an institution to the challenges of living in a digital world (i.e., as part of a digitalisation strategy).

Specifying the alignment will help to set the policy in a greater context. In some cases, it will facilitate an OER-focused policy if it can be put into a more accepted context – e.g., with arguments such as: 'In order to fully adapt to a digital world, we also need to change the learning materials we are using.' Furthermore, similarities between policy agendas may lead to the possibility of synergies in policy implementation.

Phase 3: Defining the framework of the OER policy

This chapter has introduced the concepts of the scope and scale of a policy, which determine the level at which the policy will be set and which parts of the educational system will be encompassed in the policy. Specifying the framework also provides an insight into the role regulations and incentives will be able to play in implementing the policy, based on the authority of the policy implementer to enforce or only encourage practices. The task at the end of this chapter is to make clear decisions about the scope and scale for the ***policy framework*** and formulate the consequences of these decisions for the implementation of the policy.

You are now asked to respond to the questions that follow, which will guide the strategy development process.

Guiding questions:

1 What scope and scale will the policy have?
Check the boxes in the matrix introduced in Table 3 that will be covered by the policy. More or fewer boxes will be checked, depending on the scope and scale. A singular policy focused only on OER in general education may only require one checked box, but a national policy with a thematic focus may cover most of the educational sector.

2 Describe how the various boxes in the policy framework are linked.
Formulate a paragraph for *each of the boxes* to describe how it is linked to any other box in the matrix and how these together will help to achieve the policy vision formulated in Chapter 2.

3 What role can regulations play in ensuring the implementation of the policy?
The role of regulations and other mechanisms for implementation is dependent on the authority that the implementing agency has in each of the matrix boxes and overall. A decision on the general role that regulations can play (e.g., in enforcing licensing arrangements or staff practices) leads to considerations of which expertise should be included in the policy design process, but also which official endorsements will be necessary on launching the policy. Formulate below the regulations that will be adopted or developed and the role of regulations for the policy, the level at which the regulation must occur, and the authorities that must endorse the regulations.

4 How will the OER policy be aligned with other existing policies?
Make a clear statement on how the policy document will be presented with the policy context and/or aligned with other policies. Will the OER policy stand alone or be integrated as an integral component of another policy? Will the OER policy be developed with a specific focus on OER, open licensing frameworks and strategies for digital content, under an ICT in education policy, and/or under an overall education sector development strategy? Specify the policy alignment.

5 Review the policy vision
Link back to the policy vision in Chapter 2 to ensure that the framework, which provides a focus for policy design and implementation, can still achieve the goals formulated in the policy vision.

Chapter 4

Executing the gap analysis

Overview

A policy aims to achieve specific objectives. These specific objectives should be clearly linked to the policy vision (Chapter 2) and focused on specific levels and sectors of the education system (Chapter 3). The next step is to develop an operational theory of change: Where are the gaps and where is policy intervention most necessary? How could policy intervention help most by filling in the gaps and achieving the expected objectives? This chapter introduces four main strategic areas where gaps should be assessed: the current knowledge level of stakeholders, the provision of learning materials, possible technical and regulatory obstacles to using OER, and the type and content of training and support provided to teachers and instructors. At the chapter's close, the policy-maker will have gained insights into key gaps in the landscape that will have to be addressed by programmes to be planned under the policy. This provides a basis for drafting the masterplan (Chapter 5).

After reading and working through this chapter, you are expected to be able to:

- ***Assess the level of awareness of open education and OER of key stakeholders in your country or institution***
- ***Identify the gaps in the provision of high-quality learning materials***
- ***Determine the changes in technical infrastructure, quality assurance and teacher support required to make the policy effective***

A framework for analyzing gaps in accessing, creating and using OER

The purpose of the gap analysis is to understand the actual situation upon which the policy will be built, and to assess the areas and extent of the change to be made to reach the expected situation formulated in the policy vision.

The gap analysis should cover central topics that are key to implementing the OER policy and to ensuring its sustainable impact. Overestimating the current situation risks producing an over-ambitious policy that will experience significant problems at the implementation stage. Underestimating the situation risks designing a conservative policy that will do very little to further develop the current levels of activity and practice in the field.

The ultimate objectives of an OER policy are to ensure: key stakeholders have judicious awareness and knowledge about open licences; governmental agencies or institutions adopt regulations to openly license publicly funded educational materials; institutional content providers and active users form sustainable models or benevolent cycles for the creation, adaptation and sharing of OER; ICT service providers and OER managers ensure inclusive and equitable access to quality OER through improving ICT infrastructure, enhancing the accessibility of OER, and optimizing OER platforms; and training providers develop the capacity of teachers, students and other key education stakeholders in creating, using and sharing OER, and in applying open licences correctly.

In this context, the cyclical process of creating and using learning materials provides a framework to analyse key gaps between the current general situations and the key objectives as envisaged by the OER policy. Table 5 shows a simplified pathway of creating and using learning materials. At each step of the pathway, diverse use cases are listed, the relevance of regulations to orientate learning materials towards OER is given, and the requirements for ICT infrastructure and tech enablers are specified. The final step – *Learning materials are reviewed and proposed for revision* – is to return to the first step, since the OER process always begins with reviewing existing materials.

Table 5: Stages in the creation and use of learning materials

Key steps	Possible use cases	Regulations for OER	ICT infrastructure and technology enablers
1 Authors create learning materials.	Ranging from individual people to groups or a community/ consortium of authors, including ad hoc creation (for a particular setting) or periodical creation (for multiple settings)	Open licences adopted for different types of materials provide legal permission and motivation for users to take existing resources and adapt them to new settings. Therefore, the gap analysis questions are: • Are relevant resources publicly available and searchable? • What share of the publicly funded materials are openly licensed? • What share of the learning resources are provided in a form enabling easy adaptation? • Does this process of adaptation already happening?	ICT infrastructure and tech enablers for OER: • In the form of accessible repositories or referatories to enable the discovery of relevant pre-existing learning materials • In the form of editors to facilitate the adaptation of the learning resources • In the form of communication and collaboration tools to facilitate cooperation between authors (and versioning control)

Key steps	Possible use cases	Regulations for OER	ICT infrastructure and technology enablers
2 Learning materials are authorized to be used in a particular learning setting.	In formal education settings, authorization is compulsory to ensure that it aligns with a national or consortium curriculum; in non-formal education settings, authorization is driven by the need to achieve expected learning outcomes or certification; in informal learning settings, authorization may not be necessary.	OER, especially those adapted or generated by users, can only be used if they are authorized for specific learning settings. Therefore, the gap analysis questions are: • What share of learning materials are supplied with information that makes it clear for which purpose they were primarily designed (meta-information)? • Does the quality assurance system accept learning resources that are updated and adapted by users regularly? • Is a reform of the quality assurance system necessary?	ICT infrastructure and tech enablers for OER: • In the form of accessible repositories or referatories to provide metadata on learning resources
3 Learning materials are made accessible to all learners.	Learning materials are: made available or not available to learners with barriers related to time, place and disabilities; and made accessible in digital format, either dependent on a specific access device (e.g., via an institutional LMS) or irrespective of device (e.g., through an html-based website).	Regulations to ensure learning materials are made in formats that enable accessibility irrespective of time and place or specific device. • How are learning resources generally made accessible to learners in the specific settings corresponding to the scope and scale of the policy? (See Chapter 3.) • Can this access be made anytime, anywhere and with any devices? • Has this access taken into consideration persons with disabilities and other special needs?	ICT infrastructure and tech enablers for OER: • In the form of user-accessible connected digital devices to ensure universal access to learning materials • In the form of easily searchable and accessible databases of learning materials • In the form of LMSs that recommend content relevant to individual needs based on analytics of learning patterns
4 Learning materials are reviewed and proposed for revision.	Comprehensive sets of curricular-associated programmes of study are updated and adapted only periodically and by authoritative institutions, while the materials with small granularity can be reviewed and adapted spontaneously by peers.	Regulations to allow openness and flexibility in curricular management, to adopt competency-based learning outcomes and assessment, and to encourage learners to revise content and create knowledge: • How are learning outcomes defined and related to learning materials used? • What are the current evaluation procedures for sets of content associated with national curricula? • Who is involved in current evaluation procedures? • How are the institutional content designers and providers informed by the results of content evaluation?	ICT infrastructure and tech enablers for OER: • In the form of platforms supporting transparent assessments of the usefulness and relevance of learning materials • In the form of online communities of practice to support peer reviews and open evaluations of learning materials among users of OER

Note: For first column, cf. criteria as enablers for education in the ITU report *Working Group on the Digitalization Scorecard* (2017).

Main areas of the gap analysis

Under the aforementioned framework, the gap analysis should cover the following strategic areas:

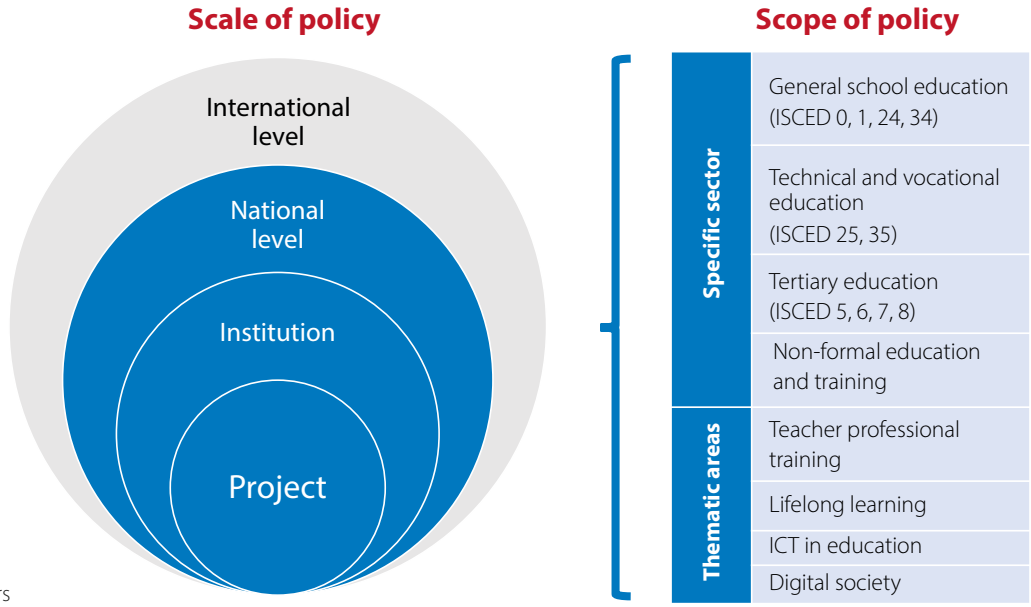
- Awareness and knowledge level of open licensing and OER by key stakeholders
- Availability and accessibility of good-quality content
- A regulatory framework to enable the creation and use of OER
- ICT infrastructure and technology support for finding, reusing and sharing OER
- Users' capacity to develop and use OER in the field

Awareness and knowledge of key stakeholders about open licensing and OER

The gap analysis must start out from an assessment of the knowledge of open licensing and OER held by the central stakeholders. Knowing this will help to decide the focus of the OER policy intervention and to determine the level of new knowledge necessary to make the OER policy work effectively. This aspect of the policy is directly related to the idea of the diffusion of innovation, since every policy intervention could be – at least loosely – characterized as an innovation, requiring people to adapt products and practices that they do not usually use (Eveland, 1986; Tornatzky, Eveland, & Fleischer, 1990).

The stakeholders relevant to OER policy and practice vary according to the scope and scale of the policy as determined in Phase 3 (see Chapter 3). This relationship is shown in Figure 12, and the key stakeholders are further specified in Table 6.

Figure 12: Scope and scale as the framework for the gap analysis



Source: Authors

Figure 12 shows the relationship between the different levels of policy and how they relate to each other in an effective policy design. If the scale of the policy is 'project', the initiative will be particularly helped if the institution also adopts policies that support the project pilot – and this is the case for all subsequent levels. In each case, the gap analysis should also include a review of the situation in the specific educational sectors and thematic areas encompassed by the policy. Table 6 lists the respective stakeholders for each of the levels.

Table 6: Key stakeholders by scale of the policy framework

National	→ Policy-makers, including policy-advisers, policy-unit heads, ministers, etc. → Parliamentarians (with an educational and ICT focus) → Content providers → Central agencies within the educational system (e.g., for funding and quality assurance)
Institutional	→ Institutional leaders → Institutional strategy unit, if it exists → IT support unit and/or library support centre → OER practitioners/champions → Representatives of teachers, students, key partners
Project	→ Project managers → Teachers/instructors → Learners → IT support staff and/or library support staff → Funders

The gap analysis should gather information from the relevant stakeholders (i.e., those at the targeted level and one level above and those in the targeted sector) to answer the following questions:

Q1: What share of the stakeholders have sufficient knowledge about open licensing and OER to be capable of implementing OER practices without an introductory course on the characteristics and uses of OER? *This question should be focused on the level of policy and the level above (as the latter might be responsible for enabling actions), and the sector or theme targeted by the policy.*

> ***Responses might be collected through a survey, through targeted focus groups or indeed through using available studies from the field.***

Responses might be collected through a survey, through targeted focus groups or indeed through using available studies from the field. The specific questions used to provide this aggregate assessment should be related to whether users are familiar with the concept of open licensing and how this relates to copyright in their work situation, whether they can define OER, and whether they have used or even developed OER in practice. The answers can be scored as follows, for example using an adapted traffic-light system for each of the relevant stakeholders in each of the relevant sectors:

✓ None have sufficient knowledge	dark red
✓ Less than 5% have sufficient knowledge	light red
✓ 5% to 15% have sufficient knowledge	amber
✓ 15% to 25% have sufficient knowledge	light green
✓ 25% or over have sufficient knowledge	dark green

These bands are based on the experience of awareness of OER in the higher education sector of the USA. In 2017, after many initiatives and a focus on providing OER-based textbooks for introductory courses in higher education, the awareness of OER lies at thirty per cent of faculty staff saying they are aware or very aware of OER (up from twenty per cent in 2015) and twenty-five per cent saying they are aware or very aware of both OER and the opening licensing of Creative Commons (the common standard for this region) (Allen & Seaman, 2016; Seaman & Seaman, 2017).

The consequences of this information for the policy design are that areas where knowledge is low require a policy focus on informing stakeholders of the basic concepts of OER, as explained in Chapter 1. If knowledge is low in one educational sector but higher in another (or low in one institution but higher in another), peer learning between sectors (institutions) may be a good way to promote knowledge exchange.

Availability and accessibility of high-quality content

One of most important objectives of an OER policy is to provide access to high-quality learning materials for all. So an important question for the gap analysis is:

Q2: Where are the gaps in the provision of high-quality learning materials for all? *This question should be focused on the level and sector or theme targeted by the policy.*

A response to this question requires at least the following sub-questions to have been covered:

- What is the quality of learning materials available to users in the target sectors of the policy? (Evaluate the subject coverage and how up-to-date and didactically sound the information is.)
- What is the overall availability and discoverability of good content – i.e., what is objectively available, and how easy is it for others to discover and use this content?
- Who develops these materials, and what business models are used in developing the main learning materials – private companies, public authorities, teachers/instructors, others?

In principle, learning materials can be developed on the basis of three different business models (Orr, Rimini, & van Damme, 2015):

- Profit-based models, where producers are from the private sector and sell learning materials
- Donation and grant models, where the producer finds funding to cover the full costs of developing and distributing the learning materials
- Community-based models, where community members contribute to the production of learning materials

Suppliers of learning materials on a profit basis are likely to be hardest to encourage to move to supplying OER, since open licensing significantly changes the revenue base for their business model (i.e., they cannot raise revenue through updates to previously existing learning materials). Community-based models may be the most open to applying the principles of open licensing to their materials, but regulation of development and use, and particularly of quality assurance, will have to be reviewed and developed accordingly.

A relevant question for the gap analysis is:

Q3: What share of the overall provision of learning materials is provided through profit-based, donation- or grant-based, and community-based business models? *This question should be focused on the level and sector or theme targeted by the policy.*

Regulation framework to support the creation and use of OER

The two extremes are the production of learning materials by a commercial supplier versus the production of materials by individual instructors. In the latter case, the OER framework would allow the individual instructor to use materials from third parties as the basis of their adaptation and repurposing. However, for this to be effective, materials must be easily discoverable and allow such adaptations.

The gap analysis should therefore find an answer to the following question:

Q4: Do existing content or publication regulation frameworks enable the open licensing of learning materials and provide permission for adapting the content developed by others? *In other words, there are two sub-questions: Does open licensing exist? Are the materials technically open, so they are easily adaptable?*

> ***If learning materials are to be an integrated part of a programme of learning, at least the formal education sector will often require these materials to be officially approved or allowed.***

If learning materials are to be an integrated part of a programme of learning, at least the formal education sector will often require these materials to be officially approved or allowed. So an important enabling factor for this stage is how quality assurance is regulated. If there are such gaps in the regulation structure, these will inhibit the use of OER. This leads to a further question for the gap analysis:

Q5: Does the current system allow OER to be used? Does the use of OER require a review of the quality assurance mechanisms? *This two-part question should be focused on the level and sector or theme targeted by the policy. If the situation is better in other sectors, this should also be included in the analysis.*

Finally, all learning materials used in educational settings should be reviewed and evaluated for their effectiveness. The result of such a review is the redevelopment of the materials in new versions. This virtuous cycle is a specific focus of OER policy (see Figure 7 in Chapter 1).

The review and evaluation of learning materials is facilitated through connecting learning materials to expected learning outcomes and utilizing ICT systems (where possible) to link the actual learning outcomes to engagement with learning materials. This is most directly possible if all learning takes place within one learning ecosystem (with content, learning assessment and discussion forums), such as in the Khan Academy.[43] More indirect forms of evaluation require surveys of learners (combining socio-demographic characteristics and individual learning outcomes) and discussions with them on their satisfaction with the content. Such systems can contribute to improving the acceptability of OER as learning

43 https://www.khanacademy.org/

materials. So the gap analysis should review how materials are currently evaluated and decide whether changes will be necessary for the use of OER-based materials.

Q6: How is the effectiveness of learning materials currently assessed, and should changes be made here for the implementation of OER-based materials? Can ICT solutions support this process? *This three-part question should be focused on the level and sector or theme targeted by the policy. If the situation is better in other sectors, this should also be included in the analysis.*

ICT infrastructure and connected digital devices to support access to and management of OER

ICT infrastructure and connected digital devices can support both discovery (through repositories) and adaptation (through easy editing). For developing countries, an important aspect of this is technical accessibility in regions where access to ICT and the Internet is restricted. Box 4.1 provides two examples of initiatives improving accessibility under such conditions. An OER policy with a focus on providing wide access to higher-quality materials would seek to minimize accessibility gaps. The gap analysis therefore needs to ask:

Q7: Are there gaps in the available technical support and technical infrastructure that inhibit or would inhibit the adaptation of OER for new purposes? *This question should be focused on the level and sector or theme targeted by the policy. If the situation is better in other sectors, this should also be included in the analysis.*

Box 4.1: Bringing the power of online learning to offline environments

In their analysis of the OER Research Hub dataset, de los Arcos and Weller (2018) find that teachers from the Global South are more likely to emphasize technical problems as barriers to the use and adaptation of OER. This is why special low-tech solutions are necessary for such regions.

The Aptus[44] device from COL

Aptus is a low-cost device that allows educators and learners to connect to digital learning platforms and content without the need for grid electricity or Internet access. This mini-server requires only battery power and can be recharged via grid power or solar charger, as needed. It can host up to 128 GB of educational content and facilitate interactive, virtual learning – whether in a remote rural village or on a vast university campus. The result is a 'Classroom Without Walls' that can be set up within minutes and accessed by any learner with a laptop, tablet or mobile device.

Foundation for Learning Equality[45]

Learning Equality, a Google.org-funded non-profit, considers the digital divide a major impediment to OER adoption worldwide. It focuses on making OER available to populations without Internet access by means of open-source software, teacher training, content curation services, and fully supported tools such as its first-generation platform, Khan Academy Lite.

Its present project, Kolibri,[46] enables the bundling of a broad range of OER (including most well-known sources), curated for local curricular standards and suitable for distribution completely offline and on low-cost hardware such as the Raspberry Pi, along with learning pathway planning, differentiated instruction dashboards, and LMS functionalities to help educators make full use of this library. Presently, Kolibri is in use in 109 countries, with upwards of 5,000 installations, and is formally piloting and increasing to scale through its present focal implementations: teacher training in Mexico with the Union of Businesspeople for Technology in Education, rural and urban formal education in India with Motivation for Excellence, and informal education in refugee camps in Kenya and Uganda with UNHCR and the Vodafone Foundation.

44 https://aptus.col.org/
45 https://learningequality.org/
46 https://learningequality.org/kolibri/

Learning materials must be made in formats that are easily accessible to teachers and learners. This is largely a question of whether they are provided online or offline, are physical or virtual, and whether a student must be enrolled in a programme or have access to a content system (such as an LMS) to be able to use them. So this is a question of how access to the materials is enabled. In the case of an LMS, recommendation systems can help teachers and learners find the materials most appropriate to their needs.

Q8: How is access to learning materials regulated and technically supported currently, and do gaps here restrict the access for some potential learners? *This question should be focused on the level and sector or theme targeted by the policy. If the situation is better in other sectors, this should also be included in the analysis.*

Capacity of users to develop and use OER in the field

Designing an appropriate OER policy is dependent on understanding the current state of users' capabilities in relation to using digital media and OER in the field. According to one approach called the 'OER adoption pyramid' (Cox & Trotter, 2017; Trotter & Cox, 2016), there is a hierarchy of factors that affect how OER are actually utilized in learning settings. These include infrastructural access, legal permissions, conceptual awareness, technical capacity, material availability, and prevailing cultural and social context. But the final behaviour is shaped by the pedagogical values of the agent (the educator and/or their institution) and the strength of the culture and incentives encouraging the sharing and reusing of OER. This is a particularly important insight for any OER initiative wishing to reach out beyond small pockets of innovation (i.e., beyond the level of a pilot project as policy focus).

Designing an appropriate OER policy is dependent on understanding the current state of users' capabilities in relation to using digital media and OER in the field.

A gap analysis should therefore start out by reviewing the current content of both initial teacher training and professional in-service training of teachers during their career with the question:

Q9: What training do teachers and instructors receive to support their active use of learning materials, including supporting a culture of exchange and collaboration between teachers at different institutions? *This question should be focused on the level and sector or theme targeted by the policy. If the situation is better in other sectors, this should also be included in the analysis.*

If such training is provided, the OER policy can extend this to encompass the particular opportunities available for collaborating on OER-based learning materials, including an awareness of the need to ensure a high level of quality, user-friendliness and alignment to curricular needs. If such training is only provided in initial training, it will be necessary to extend it to professional in-service training so that all teachers and instructors in the field have the capabilities to select, use, adapt and improve existing materials. COL provides online training on 'Understanding Open Educational Resources'.[47]

In some cases, while formal teacher training does not include such content, bottom-up initiatives in the field will have grown to help those teachers and instructors learn from each other how to use OER. This was indeed the background to a recent OER-focused funding programme in Germany, where the policy supported bottom-up initiatives building capacity by providing funding for these events to take place on a larger scale and by supporting further multiplier initiatives in educational institutions (Orr, Neumann, & Muuß-Merholz, 2017). Therefore, the gap analysis must also ask about informal capacity support:

Q10: Are there already informal support structures within parts of the educational system that can be built on and expanded through a dedicated policy initiative? *This question should be focused on the level and sector or theme targeted by the policy. If the situation is better in other sectors, this should also be included in the analysis.*

In a country – or at least the part of the educational system targeted by the policy – there may be some teachers and instructors who have already developed relatively mature capabilities around OER and who already promote a sharing culture in their teaching. For such situations, an initiative called the 'open educator factory' provides a tool for assessing the share of instructors who have OER readiness (Nascimbeni & Burgos, 2016). The initiative starts out from the assumption that a strong relationship exists between the use of open approaches and the networking and collaboration attitude of educators, and that to overcome the technical and cultural barriers that hinder the widespread use of open approaches, it is important to work on the transition phases (in terms of awareness and capacity building) that educators go through in their journey towards openness. Besides a framework describing these transition points, the team has also developed a survey that can be used by institutions and educators to determine their point in the 'journey' (Nascimbeni & Burgos, 2016).

47 https://learnoer.col.org

Phase 4: Reviewing the results of the gap analysis

This chapter has walked through the various dimensions that a gap analysis as preparation for an OER policy should cover. The results of this analysis will help the policy-maker to determine what the OER masterplan should cover to ensure a successful OER policy, which promotes the use of OER for a positive impact on access to high-quality learning materials and learning experiences.

The task at the end of this chapter is to summarize the main outcomes of the **gap analysis** and to sketch the initial conclusions for the **masterplan** resulting from these insights.

You are now asked to provide the key insights on the gap between policy vision and current status quo for each of the nine questions raised in this chapter.

Guiding questions:

1 **What share of the stakeholders have sufficient knowledge about open licensing and OER to be capable of implementing OER practices without an introductory course on the characteristics and uses of OER?** *This question should be focused on the level of policy and the level above (as this level might be responsible for enabling actions), and the sector or theme targeted by the policy.*

2 **Where are the gaps in the provision of high-quality learning materials for all?** *This question should be focused on the level and sector or theme targeted by the policy. See the four sub-questions on this topic.*

3 **What share of the overall provision of learning materials is provided through profit-based, donation- or grant-based, and community-based business models?** *This question should be focused on the level and sector or theme targeted by the policy.*

4 ***Do existing content or publication regulation frameworks enable the open licensing of learning materials and provide permission for adapting content developed by others?*** *In other words, there are two sub-questions: Does open licensing exist? Are the materials technically open so they are easily adaptable?*

5 **Does the current system allow OER to be used? Does the use of OER require a review of the quality assurance mechanisms?** *This question should be focused on the level and sector or theme targeted by the policy. If the situation is better in other sectors, this should also be included in the analysis.*

6 **How is the effectiveness of learning materials currently assessed, and should changes be made for the implementation of OER-based materials? Can ICT solutions support this process?** *This question should be focused on the level and sector or theme targeted by the policy. If the situation is better in other sectors, this information should also be included in the analysis.*

7 **Are there gaps in the technical support and technical infrastructure available that inhibit or would inhibit the adaptation of OER for new purposes?** *This question should be focused on the level and sector or theme targeted by the policy. If the situation is better in other sectors, this information should also be included in the analysis.*

8 **How is access to learning materials regulated and technically supported currently, and do gaps here restrict access for some potential learners?** *This question should be focused on the level and sector or theme targeted by the policy. If the situation is better in other sectors, this information should also be included in the analysis.*

9 **What training do teachers and instructors receive to support their active use of learning materials, including supporting a culture of exchange and collaboration between teachers at different institutions?** *This question should be focused on the level and sector or theme targeted by the policy. If the situation is better in other sectors, this information should also be included in the analysis.*

10 **Within parts of the educational system, do informal support structures already exist that can be built on and expanded through a dedicated policy initiative?** *This question should be focused on the level and sector or theme targeted by the policy. If the situation is better in other sectors, this information should also be included in the analysis.*

Reassessing previous planning steps

It is important that a policy remain realistic, even when it is visionary (see Chapter 2). Use your assessment of the gaps to consider whether the vision (Chapter 2) and the scope and scale of the policy (Chapter 3) are realistic in view of the current landscape. Make modifications to the previous phases as necessary.

Chapter 5

Designing the masterplan

Overview

This chapter describes the main building blocks for OER policy, specifying the key activities and who should be involved in these processes. It proceeds from the gap analysis, which has shown where particular policy interventions should be planned to ensure that the policy works to fulfil the vision (see Chapter 4). The role and specifications of each building block are related to the scope and scale chosen for the OER policy (see Chapter 3). At the close of this chapter, the policy-maker will have completed a full draft of the masterplan for OER and will be ready to consider the implementation strategy (Chapter 6).

After reading and working through this chapter, you are expected to be able to:

- *Identify the specific objective of each building block in OER policy*
- *Choose appropriate activities and stakeholders for the different building blocks*
- *Put together the building blocks logically to prepare the OER policy masterplan*

Purpose of the masterplan

The masterplan is the document consisting of specific building blocks for the whole policy. In this chapter, the necessary building blocks for OER policy plans will be discussed. Together, these building block give the policy an operational foundation. The information from the previous chapters – understanding OER (Chapter 1), policy vision (Chapter 2), policy framework (Chapter 3) and especially the gap analysis (Chapter 4) – should be used to guide the design of the masterplan.

In the following sections, eight typical building blocks are presented. It should be noted that the building blocks in this chapter are illustrative rather than exhaustive. These building blocks should be adjusted according to the context and needs of your OER policy, and additional building blocks can be added.

These building blocks are:

1. Adopting an open licensing framework
2. Integrating OER into curriculum
3. Ensuring the development, storage and accessibility of OER
4. Aligning quality assurance procedures
5. Supporting capacity building and awareness raising
6. Encouraging sustainable business models and launching funding strategies
7. Promoting evidence-based research on the impact of OER
8. Having a governance mechanism for the OER policy

The description of a building block in the masterplan should be specific about the following aspects:

- → Objectives: *What is the aim of the building block?*
- → Main activities and target sectors: *What is to be done?*
- → Key partners for implementation: *Who is involved?*
- → Indicators: *How will success be measured?*

The suggested indicators can be divided into two types: *quantitative* and *normative*. Quantitative indicators lead to a numeric value (e.g., a percentage of all teachers). Normative indicators test whether certain norms have been changed through altering regulations or instructions and are normally dichotomic – i.e., either fulfilled or not. Again, the indicators are only illustrative and should be developed to be specifically in line with the actual policy being designed.

In general, the building blocks presented on the next page will be relevant to the policy-maker irrespective of the scope and scale of the policy (Chapter 3), although this difference will have an impact on which specific stakeholders should be involved in implementation.

Basic building blocks for an OER masterplan

Adopting an open licensing framework

The most important building block in any OER policy is the adoption of an open licensing policy, as described in Chapter 1. Table 7 shows the suggested elements for this building block. The main objective is to make it easy for users to adopt an open licensing arrangement for their learning materials.

Table 7: Building blocks of open licensing

Key building blocks	*What is the aim?* **Objectives**	*What is to be done?* **Main activities and target sectors**	*Who is involved?* **Key partners for implementation**	*How will success be monitored?* **Indicators**
Adopting an open licensing framework	To enable and simplify the use of open licensing for learning materials	Review and adapt regulations relating to the use of open licensing for learning materials to establish an open licensing framework. Ensure that all publicly financed teaching and learning resources are released under open licences. Encourage users to use open licensing for self-generated content.	Legal experts for developing an open licensing framework Creators of public tenders to ensure that open licensing is a condition of funding Institutions and individuals who develop learning content	*Normative:* Regulations on the use of learning materials in educational settings make specific reference to OER and open licensing. *Quantitative:* Share of public contracts for learning materials requiring an open licence Share of learning materials covered by an open licence

The Creative Commons framework for open licences has become very popular, but this is only one option (see Chapter 1). One of the catalysts of the world-wide growth of the use of CC licensing is the bottom-up adoption of open licences, as many creators of educational resources have simply decided to add a CC licence to their works.

However, the most important actors in the process of adopting OER are governments – they can enact new regulations, change their contracting requirements to include the use of OER, and launch information campaigns to further encourage users to openly license their works. This building block should cover three activities: establishing a licensing framework, ensuring that learning materials produced for or in the public sector are openly licensed, and encouraging individuals and institutions to use these licences. See Box 5.1 for examples.

Box 5.1: Examples of national schemes supporting OER through a licensing framework

Establishing an open licensing framework

Realizing that significant creative and economic potential may lie dormant in copyright-protected and non-copyright-protected materials when they are locked up in state agencies and not released on terms allowing reuse by others, the New Zealand Government has adopted an overall open-access and licensing framework called NZGOAL,[48] with the aim of realising two-fold potential:

- the potential for individuals, non-profits and commercial organizations to leverage this material for creative, cultural and economic growth, improved environmental sustainability, greater productivity and the wider public benefit; and
- the potential for experts and others to contribute to improved policy development and more efficient financial performance by government through being able to access, manipulate and provide feedback on such material.

OER as default

The Bahrain OER policy states as one of its objectives: '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.' (Miao, Mishra, & McGreal, 2016, p. 39)

Incentivizing the production of OER

An example of a large-scale, fund-based open-education licensing strategy is the US Department of Labor's 2010 Trade Adjustment Assistance Community College and Career Training Grant programme (TAACCCT), which committed USD 1.9 billion in federal grant funding over four years to 'expand and improve their ability to deliver education and career training programs' (p. 1). The intellectual property section of the grant programme description requires that all educational materials created with grant funding be licensed under the CC Attribution licence (CC BY), and the department required its grantees to deposit editable copies of CC BY OER into skillscommons.org – a public open-education repository.[49]

Since licensing is a legal matter, this building block will be reliant on legal experts who can review the implications of enforcing an open licensing framework in each of the sectors targeted by the policy. How open licensing has been adopted differs across countries (COL, 2017): some countries have policies and regulations that cover the whole education system; others have adopted a policy regarding higher, secondary or primary education. Many have no explicit open licensing legislation but encourage publicly funded institutions to pursue open licensing policies.

The implementation of a national open licensing framework depends to a large extent on the willingness and permission of the copyright holder(s). This is determined by governance arrangements (e.g., public authorities can regulate public-sector educational institutions directly but not private-sector providers) and employment contracts. Hence, such a framework might be enforced, incentivized or recommended to users. For instance, many universities and colleges around the world have set open licensing as the default for materials produced by their employees (see Box 5.2).

Indicators for the success of this policy building block are that regulations on the use of learning materials in educational settings specifically reference OER and open licensing. This is a normative requirement and should be fulfilled. The quantitative indicators relate to the share of public contracts for learning materials requiring an open licence as an input indicator and the share of learning materials covered by an open licence as an output indicator.

48 https://www.ict.govt.nz/guidance-and-resources/open-government/new-zealand-government-open-access-and-licensing-nzgoal-framework/new-zealand-government-open-access-and-licensing-framework-version-1/

49 https://doleta.gov/taaccct/

Box 5.2: A focus on institutional policies

Technical University of Delft, The Netherlands[50]

This university **encourages** its lecturers to publish their educational material under an open licence. Openness is at the heart of TU Delft's strategy, and OER is an essential building block. The strategy states:

'We make Open Educational Resources part of TU Delft's education policy by:

- Structurally supporting lecturers and students with the use of such means
- Encouraging lecturers to publish their educational material under an open licence
- Making open education part of the basic teaching qualification programme and the evaluation criteria of courses
- Replacing commercial textbooks by open resources in all BSc programmes as much as possible'

University of Edinburgh, Scotland[51]

As part of its commitment to open education, the University of Edinburgh has adopted an institutional OER policy. This policy **encourages** staff and students to use, create and publish OER to enhance the quality of the student experience. The university retains the copyright and requires the naming of the originator:

'Staff and students are advised to publish OERs using a Creative Commons attribution licence (CC BY).[...] When creating and publishing OERs, the copyright owner(s), author(s), date and Creative Commons licence applied must be visibly attributed. The copyright owner will normally be the University of Edinburgh for OERs created at the University. Author(s) should also be properly acknowledged[...]. An example of good attribution would be: © [Author Name], University of Edinburgh 2016 CC BY.'

University of the South Pacific, Fiji[52]

This university is owned by the governments of twelve Pacific island countries (the Cook Islands, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu and Vanuatu). Its OER policy, which is effective to 2020, **sets** open licensing as the default, but decisions on licensing remain within the authority of the university itself:

'The University retains intellectual property rights in all teaching and learning resources developed by its staff.[...] The University shall adopt the most current Creative Commons licensing system for its open licenses.[...] The University reserves the right not to share resources that may be commercially viable.'

Integrating OER into curriculum

In the context of SDG 4, curriculum adjustment and the development of appropriate curricula is highly important not only at the national level in specific country contexts, but also at the institutional level to provide the skills needed to achieve sustainable development for all. While mostly the issue of curriculum is left to experts to decide the contents and methodology of teaching, learning, and assessment, it is important to provide policy guidelines to the experts for considering OER to address the needs and aspirations of the society they serve. Thus, many national governments are reviewing curricula to prioritize skills development in youths and provide lifelong learning opportunities for adults. National and international perspectives may be required for many curricular dimensions, such as the environment and climate change, global citizenship education, gender, disability, among others. Rapid changes in technology, and their impact on teaching and learning environments, also mean that curricula need ongoing updates and revisions, sometimes leading to radical curricular reform. It is the joint responsibility of governments and educational institutions to respond to social needs, take steps towards appropriate curriculum development and adopt the required reforms. OER can help avoid the duplication of effort, including by contextualizing existing resources from across the world. The

50 See https://www.tudelft.nl/en/about-tu-delft/strategy/tu-delft-strategic-framework-2018-2024/
51 See https://www.ed.ac.uk/files/atoms/files/openeducationalresourcespolicy.pdf.
52 See https://policylib.usp.ac.fj/form.readdoc.php?id=736.

increasing demand for quality education that (1) is relevant to learners' needs, (2) provides employment skills and (3) prepares learners for lifelong learning can be addressed by an OER policy that considers issues related to curriculum development. Table 8 suggests the key building blocks.

Table 8: Building blocks for curriculum development

Key building blocks	*What is the aim?* **Objectives**	*What is to be done?* **Main activities and target sectors**	*Who is involved?* **Key partners for implementation**	*How will success be monitored?* **Indicators**
Ensuring integration of OER at the level of curriculum development	To encourage the use of OER as a guiding principle in curricula To make available a wide range of generic OER that can be adapted by any institution	Guide experts to rethink curriculum in terms of OER use Create national (domain-specific) curricular materials as OER	Agencies involved in national-level curriculum development to be engaged in OER discussions Experts in curriculum development and educationists shaping national-level models of curriculum development	*Normative:* All or most currlcula use existing OER *Quantitative:* Number of curricular resources available as OER

A key approach to integrating OER at the curricular level is to encourage the use of OER as an overall guideline in curriculum development and to suggest relevant methodologies for adopting OER in the curriculum standards for different subject areas and interdisciplinary activities. Thus, there is a need to shift from a proprietary mind-set to a sharing mind-set and adapt existing materials. This is related to the next building block.

Ensuring the development, storage and accessibility of OER

Good-quality learning materials must be discoverable and easily accessible to users. The current status quo in the policy-maker's setting was already investigated in the gap analysis (Chapter 4). This analysis gives insights into what needs to be changed for an effective OER policy in terms of technical infrastructure and accessibility. Table 9 shows the suggested elements for this building block.

Table 9: Building blocks for the development, storage and accessibility of OER

Key building blocks	*What is the aim?* **Objectives**	*What is to be done?* **Main activities and target sectors**	*Who is involved?* **Key partners for implementation**	*How will success be monitored?* **Indicators**
Ensuring development, storage and accessibility of OER	To encourage the development of OER on all levels To make OER easily discoverable, accessible and adaptable through digital storage and editing platforms	Provide resources for teachers and other OER producers to incentivize their development and sharing of OER Create national (domain-specific) repositories / referatories / platforms for OER Build institutional repositories / platforms for OER or make links to national ones Organize or scale up community-driven OER initiatives Adopt metadata standards to facilitate discoverability	Educational institution leaders to set up reward structures for engaged OER experts Database experts for repositories and data links Representatives of users for user-friendly interfaces Content experts for metadata standards	*Normative:* All or most OER are aligned to metadata, which facilitate their discoverability. *Quantitative:* Number / share of OER contained in national platforms, accessible in national language(s)

One of the strongest arguments in favour of OER is that efforts to ensure cost-effective investment in education should incorporate the use and sharing of OER in educational resources design, development and continuous improvement, since OER can reduce unnecessary efforts by building on what is already available and can engage open communities of practice in quality improvement and quality assurance.

Therefore, facilitating the development of educational resources of high quality and making these resources easily accessible to others is key to any OER policy. The policy should include action lines focused on national, institutional and community levels to ***incentivize and reward OER engagement***, such as the following:

- On a national level, an explicit policy of stimulating (incentives, promotion) institutions and educators is likely to be needed to motivate creators to pool and share resources.
- On an institutional level, OER design and development might be integrated into the job descriptions and rewards frameworks of staffing policies.
- On a community level, user-generated OER can be encouraged and made accessible to larger groups, with governmental agencies identifying particularly engaged teachers to develop and share OER in specific subject areas and/or for specific purposes.

An important precondition for the common use, adaptation and creation of OER at national and institutional levels is that OER be stored in an integrated repository or platform, where they are easily discoverable and openly accessible.

An important precondition for the common use, adaptation and creation of OER at national and institutional levels is that OER be stored in an integrated ***repository or platform***, where they are easily discoverable and openly accessible. These storage sites are often termed OER repositories (OERR). These open repositories may contain other digital learning materials as well (in which case they are referred to as 'hybrid') and/or not actually host the materials, but provide central references to them (in which case they are called 'referatories'; Santos-Hermosa, Ferran-Ferrer, & Abadal, 2017).

The repository or platform should allow resources to be downloaded from the Internet without charge and should include any additional information required for licence compliance (such as names or contributors), and (technical) accessibility must be enabled in a format that makes adaptation and modification possible.

Most repositories for OER are institutional repositories, created by educational institutions and in many cases initially funded by multiple budget sources.

Most repositories for OER are institutional repositories, created by educational institutions and in many cases initially funded by multiple budget sources. Most of these institutional repositories are searchable from search engines, along with being searchable within their own homepages. Sometimes, repositories pool content from multiple institutions, like the Georgia Knowledge Repository, in which fourteen higher-education institutions in the US state of Georgia participate.[53]

The second type are national and other broad-scope repositories. Among governments, the most common practice appears to be setting up a repository for OER, either for all educational sectors or for specific educational sectors (e.g., for schooling: Wikiwijs in The Netherlands,[54] Klascement in Belgium,[55] the Norwegian Digital Learning Arena[56] and the NROER collaborative platform in India,[57] and France's SUP Numériques for higher education). OER Commons is an example of a broad repository not linked to governments, which hosts resources for all educational levels, primary to higher education.[58] By creating an account, anyone can submit a new OER to be included in the OER Commons. See Box 5.3 for more details of two of these examples.

53 http://gaknowledge.org/
54 https://www.wikiwijs.nl/
55 https://www.klascement.net/
56 http://om.ndla.no/about-ndla/
57 https://nroer.gov.in/home/repository
58 https://www.oercommons.org/

Box 5.3: Examples of national repositories

OER programme turned into an infrastructural provision for OER: Wikiwijs in The Netherlands[59]

Wikiwijs was started in 2009 as a Dutch national programme aimed at mainstreaming OER in Dutch public education, ranging from primary to higher education. The approach of the Dutch Ministry of Education was to engage teachers and educators in creating and sharing educational resources by providing an infrastructure though which they can (co-) develop, share, rework and use digital learning materials under open licences. When the programme-based funding ended in 2013, Wikiwijs was continued along three strands:

1 Wikiwijs Delen/Edurep Delen: This is a software application allowing teachers to either upload documents (and thereby apply a CC-BY or CC-BY-SA licence) or add links. The resources can be tagged with educational metadata, following the national standard (Netherlands learning object metadata) and are available to the world.

2 Allowing teachers to create new online materials through an online authoring platform called Wikiwijs Maken. Essential characteristics of the application are:

- Online tool, and all the created materials can be visited and used online by students
- Interactive, accessible and device independent
- Diagnostic questions/tests for students to test their understanding of the materials
- Easy to copy and remix existing materials (each lesson has a copy button for those who want to make a copy)
- Exportable in different open standards (Epub, PDF, IMSCP and QTI).
- Students do not have to log in to use the materials. If schools want to use the materials to facilitate learning analytics, dashboards or other features that require a student identity, they are encouraged to use the materials through their electronic learning environments (ELOs). Wikiwijs works with these ELOs to easily integrate the material. There are about twelve to fifteen major players in the Dutch ELO market, and Wikiwijs is integrated into nine of them.

3 Allowing teachers to search through all the materials from 1) and 2) and other OER collections, called Wikiwijs Zoeken.

The target groups are individual teachers, and more and more communities of practitioners and schools are working together to build a more coherent series of lessons rather than individual lessons.

A single portal for OER from multiple institutions: France's SUP Numériques [60]

Since 2004, the French Ministry of Higher Education and Research has supported the development of eight Digital Thematic Universities (Universités Numériques Thématiques – UNTs) and one unique web-TV portal, Canal-U, with the goals of:

- Improving the results of undergraduate students
- Publishing OER created by educators from the partner institutions
- Promoting French higher education in all the domains represented by the eight UNTs

Each UNT is a separate legal entity that brings together between twenty-five and forty partners from higher education, with a total global funding of about €1.2 million annually from the Ministry of Higher Education and Research and contributions from partner universities. Many universities belong to more than one UNT, reflecting their diverse areas of content expertise. The UNTs are not educational institutions; they do not enrol students or award diplomas. They are organizations through which the member institutions cooperate to develop OER.

The OER can be developed by a single institution or through cooperation with other French or international partners, according to the policies of each UNT. Each OER is subject to review by experts within each UNT to ensure pedagogical, scientific and technological quality. Furthermore, UNTs are financed to create an online index of their production and of other French OER in their discipline that can be found on the Internet.

A single national portal, launched in 2015, gives access to all OER from all digital universities. The portal – located at www.sup-numerique.gouv.fr – also provides educational news and highlights, information on using OER and other technology for teaching and learning, as well as a search engine for OER. This search engine has many functionalities to allow detailed searches according to factors such as discipline, type of content (course module, presentation, simulation, book, lecture, guide, case study, self-assessment, image), educational level and target users, media involved, type of CC licence, language(s), summary of contents, links to associated documents, exercises, etc., classification according to the Dewey Decimal System, those responsible for its development, and the Digital Thematic University with which it is associated.

59 https://www.wikiwijs.nl/
60 https://teachonline.ca/pockets-innovation/international/available-all-one-portal-featuring-more-34000-open-educational-resources-developed

The platforms make it easier to begin a search, but metadata on the content (original purpose, where it has been used, etc.) should also be provided, as this will help users find appropriate resources. There have been many global efforts to develop common standards for metadata, but it is more important to have metadata that refer to the specific context of the expected use of the OER being promoted through the OER policy. For instance, many repositories in the USA providing content aimed at filling the gaps in the learning materials for the national curricula for maths and language ('the common core') use this structure to make relevant materials.[61] In the same way, content experts should work together to develop the right metadata for each repository at national and institutional levels to facilitate discoverability.

Indicators of the success of this policy building block are that OER should be aligned to curricula and learning plans through metadata. This is a normative requirement and should be fulfilled. The quantitative indicator measures the number or proportion of all OER contained in national repositories (with national language accessibility), under the assumption that this will significantly improve the discoverability of OER-based learning resources.

Aligning quality assurance procedures to OER

For ease of use and to aid with deciding which OER to select, it is important to align OER with the quality assurance procedures used at the level and in the sector where the policy is focused (Chapter 3). The gap analysis has already investigated whether a modification of the quality assurance procedures would be necessary for OER (Chapter 4). Table 10 shows the suggested elements for this building block.

Table 10: Building blocks of OER quality assurance

Key building blocks	*What is the aim?* **Objectives**	*What is to be done?* **Main activities and target sectors**	*Who is involved?* **Key partners for implementation**	*How will success be monitored?* **Indicators**
Aligning quality assurance procedures	To ensure appropriate quality assurance procedures, which encourage continual improvement of learning materials	Review and adapt regulations relating to assuring the quality of OER. Allow both standard-based and user-assessed quality assurance procedures for OER.	Quality assurance / accreditation agencies Institutions / companies developing learning materials as OER User communities	*Normative:* Quality assurance procedures specifically mention OER and have been adapted to their properties. Repositories allow users to rate OER

In many countries, external quality assurance and accreditation bodies play an essential role in education. They establish the parameters for assessing good practices in education and determine whether institutions adhere to these practices. The array of educational resources available in the form of OER is wide, so standards for selecting OER are needed. Furthermore, OER are expected to be further developed and adapted by users – i.e., they are dynamic resources. It is particularly important that the quality assurance procedures being used don't inhibit this process of continual improvement.

An important contextual factor are the criteria used to generally assess the quality or fitness-for-purpose of learning materials. If the quality assurance is ***based on inputs*** – especially on ensuring that the prescribed learning materials are being used – this model will often view the OER (particularly if it is a full course/programme) as a static input, and any adaptation will require a new evaluation procedure. This type of quality assurance is more common in school-based learning than in tertiary education. In such situations, regulations should specifically mention the use of OER and regulate how adapted OER will be treated within the quality assurance procedure. This approach is taken by the Z-Degrees of Tidewater Community College in the US state of Virginia (see Box 5.4).

61 For instance, the Open Up Resources initiative in the USA: https://openupresources.org/

Box 5.4: Example of a strict quality assurance procedure for a whole programme based on OER

In this case, the quality assurance procedure is set at the institutional level at Tidewater Community College as follows:

'All Z courses will be published after being taught twice. Faculty will not add, amend, or otherwise incorporate content into the Z course. Modifications that change the nature of a Z course by 10% or more are considered substantial and require review and approval. Faculty who teach a Z course must document utilization of data regarding the effectiveness of the OER content in achieving learning outcomes. The Chief Academic Officer or his/her designee will review Z courses on a three-year cycle to ensure curricular standards are being met. [...] Only those courses that contribute to a Z degree program and that are approved by the Chief Academic Officer shall be designated "Z" courses. A faculty member who wants to either have a Z designation placed on an existing course or (b) create a new Z course must present such request to the CAO for consideration. The request will be evaluated based on the quality of the course, impact on student success, compatibility with broader program level OER efforts, and adherence to Z Course standards.'[62]

A quality assurance procedure that treats adaptation in a more flexible manner can, however, lay down requirements for OER to be approved for use in an educational setting, if it fulfils specific criteria. Examples are:

- The TIPS model developed by the Commonwealth Educational Media Centre for Asia (Kawachi, 2015). TIPS includes four dimensions: (T) teaching and learning processes; (I) information and material content; (P) presentation, product and format; and (S) system technical and technology. This model especially emphasizes that good OER should ensure discoverability through metadata, ensure peer assessment through social tagging and be based on open software, where possible. The list of criteria in the TIPS framework can be easily adapted to local contexts.
- The Achieve OER Rubric (Achieve, 2011), includes eight dimensions: degree of alignment to standards (in this case, Common Core State Standards); quality of explanation of the subject matter; utility of materials designed to support teaching; quality of assessment materials; quality of technological interactivity; quality of instructional and practice exercises; opportunities for deeper learning; and assurance of accessibility.

Such evaluation systems can be used periodically by experts for peer- or expert-review processes (see Box 5.5 on the peer-review procedure used by MERLOT) or can be built into repository systems to encourage user-based assessments. For instance, the Achieve OER Rubric is offered to users of the OER Commons repository in the USA for them to evaluate the OER resources they find in the database.

Box 5.5: Quality assurance of OER – the example of the MERLOT community[63]

MERLOT, the Multimedia Educational Resource for Learning and Online Teaching, uses a peer-review-based system of quality assurance. MERLOT began in 1997 as a project of California State University. The objective of the project was to create a repository of OER that were peer reviewed, discoverable and reusable by instructors searching for materials to use for teaching with technology. Since then, MERLOT has developed into an organization and community of staff, volunteers and members who work together to provide users with OER-based teaching and learning materials. MERLOT does not host materials itself but is instead a platform containing metadata linking to materials hosted elsewhere. The materials in the repository are categorized by academic disciplines.

All MERLOT ***materials are peer reviewed*** to ensure they are useful for the MERLOT community. The peer-review process is led by an editor and includes editorial board members and peer reviewers. The editor assigns two peer reviewers to each item. They use their editorial board's review procedures, forms and evaluation standards to independently review the material. The editor evaluates these individual reviews and creates an integrated or composite peer-review report. The composite peer review is sent to the author(s) for feedback and permission to post the review. When permission is obtained, the composite peer review is posted on the MERLOT website.

62 https://www.tcc.edu/
63 http://info.merlot.org/merlothelp/topic.htm#t=MERLOT_Peer_Review_Information.htm

The ***success indicators*** of this policy building block are both normative: quality assurance procedures used within the educational sector(s) targeted by the policy contain specific references to OER, and repositories allow users to rate OER.

Supporting capacity building and raising awareness

Teaching faculty and staff in educational institutions are the key groups in introducing, developing and sustaining OER programmes. Users must be supported through training and other capacity-building mechanisms. The current status quo in the policy-maker's setting was already investigated in the gap analysis (Chapter 4). This analysis gives insights into what needs to be changed for an effective OER policy. Table 11 shows the suggested elements for this building block.

Table 11: Building blocks for capacity building

Key building blocks	*What is the aim?* **Objectives**	*What is to be done?* **Main activities and target sectors**	*Who is involved?* **Key partners for implementation**	*How will success be monitored?* **Indicators**
Supporting capacity building and awareness raising	To enable users to fully harness the qualities of OER for teaching and learning To ensure that all stakeholders are knowledgeable about the qualities of OER and how they can be used	Adapt initial and continual professional training of teachers and instructors to include capacity building on OER. Provide training and support for library staff and other key members of educational institutions on OER. Launch information campaigns on OER, targeting educational leadership. Support and build informal communities of practice.	Professional-development agencies for different sectors of the education system Educational institutions' leaders Librarians IT departments and repository managers Teachers, instructors, users	*Normative:* Initial and continual professional development courses include modules on using OER. These courses are open for teachers, instructors and librarians. *Quantitative:* Share of teachers (in the respective educational sectors) who have received OER training within the last two years

Different stakeholders in the education system require different skills and competencies, based on their roles:

- *Teaching staff*. It is expected that teaching staff will use OER to improve their subject coverage, their lessons, their collaboration and students' learning outcomes. This is especially the case if the focus of the OER policy vision is to contribute to a process of teaching and learning transformation (see Chapter 2); teaching staff will require both an introduction to using OER, through a basic course (e.g., Understanding OER[64]), as well as support and mentorship in practice.
- *Librarians*. They are responsible for learning materials and are increasingly taking on responsibilities related to supporting the discovery and use of OER. They should particularly understand what OER are, where they can be found and how they can be aligned to different learning curricula, and they should be able to pass on this knowledge to teachers and learners. Besides introductory courses, they are likely to benefit from peer learning with their colleagues and discussions of needs with teachers and learners.

64 https://learnoer.col.org

- *IT departments and repository managers*. They will particularly need to understand how technical support through repositories and editing tools can facilitate adaptation, sharing and cross-institutional collaboration by teachers and pupils using OER. Courses and exchange of practices with an emphasis on ensuring technical openness should be prioritized.
- *Educational leadership*. They need to be aware of the benefits of OER but also the requirements for open licensing, technical infrastructure, professional training and quality assurance. This knowledge might be imparted through special courses and through general information campaigns that are also aimed at other stakeholders at the institutional and national levels (including policy-makers and heads of quality assurance agencies).

This building block may make use of the following four methods to implement capacity-building efforts:

- *Initial teacher training*. This is particularly appropriate for teachers in the school and vocational system, who undergo a systematic foundational training into which OER capacity measures can be added (e.g., in new methods of teaching and learning and/or in media training). This has the advantage that it is possible to provide all new teachers with this type of training. However, those areas where systematic teacher training is less common (e.g., university teachers) will not be covered by this type of training.
- *Professional continuous training*. All teachers and instructors, regardless of level, are likely to be required to undergo regular training to keep them up-to-date with developments in the sector. OER capacity-building measures can be integrated into existing programmes or added as special short-term courses offered as modules that also make use of digital learning formats.
- *Network participation events for exchange and peer learning on OER*. This is a voluntary type of support but can be very popular, especially with people who are already interacting with OER and now want to exchange their ideas, questions and challenges with people who may have similar problems and similar experiences. This type of informal support provides an opportunity to foster a sharing culture through the creation of communities of practice and to strengthen individual commitment to OER. The German case suggests that this type of support is very effective – see Box 5.7.

Box 5.6: An individual guidance toolkit for open licensing, from Australia[65]

A useful tool for supporting the adoption and correct use of open licences should start from an understanding of the complex area of regulations. The Open Educational Licensing project, released in 2016, was a joint initiative by the Swinburne University of Technology and the University of Tasmania. It was supported by the Australian Government Office for Learning and Teaching. The resulting toolkit aims to clarify the copyright and licensing issues around MOOCs and other open online resources in the current Australian higher education market and to develop and disseminate practical resources to help Australian universities compete globally.

Box 5.7: The significance of barcamps for supporting local networks of practice and exchange in Germany

In Germany, most OER activities have been primarily driven by enthusiasts (i.e., they are bottom-up). This has led to a need for opportunities to share questions, experiences and materials between players isolated in their own institutions. These players found opportunities for sharing at cross-sector events and within relevant communities. In particular, the barcamp/unconference format has turned out to fit well with the goal of developing a strong German OER community. These are user-generated conferences where participants provide the content. Attendees schedule sessions by writing on a Post-It note and placing this on a grid of sessions (this is often done digitally using collaborative platforms to collate the information and organize the sessions). In 2017, around 750 participants attended four barcamps with around 150 mini-workshops and barcamp sessions on OER (Orr, Neumann, & Muuß-Merholz, 2017).

65 http://www.oel.edu.au/

In all these settings, the learning and professional training undertaken should be formally recognized (e.g., in the form of digital badges or credit points). This will increase the motivation level and provide a more transparent picture of who has undertaken training and when.

The sustainability of these practices will be ensured if the funding and reward structures are appropriate to fostering OER activities.

The first ***success indicator*** in this policy building block is normative: initial and continual professional development courses include modules on using OER, and these courses are open for teachers, instructors and librarians. A quantitative indicator measures the share of teachers (in the respective educational sectors) who have received OER training within the last two years. This assumes that most teachers exposed to OER should have the opportunity to learn more about OER and exchange practices with their peers at least every two years.

Encouraging sustainable business models and launching funding strategies

Promising initiatives must be instigated and supported by the OER policy, but the policy should also ensure that successful initiatives are sustainable in the long term. The review undertaken as part of the gap analysis led to insights into the sources of learning materials and their business models (Chapter 4). This analysis gives insights into what needs to be changed for an effective OER policy. Table 12 shows the suggested elements for this building block.

Promising initiatives must be instigated and supported by the OER policy, but the policy should also ensure that successful initiatives are sustainable in the long term.

Table 12: Building blocks for sustainable OER

Key building blocks	*What is the aim?* **Objectives**	*What is to be done?* **Main activities and target sectors**	*Who is involved?* **Key partners for implementation**	*How will success be monitored?* **Indicators**
Encouraging sustainable business models and launching funding strategies	To ensure that the cycle of OER production and reuse is sustainable over time for those actors involved in their production and reuse	Providing public contracts for learning-material production that requires OER solutions, and encouraging other funding agents to do the same (e.g., NGOs and donors) Encouraging private-sector firms to integrate OER into their business models Ensuring adequate rewards (time, money) for OER designers and redevelopers	Creators of public tenders (government) Private-sector firms, start-ups Civil-society organizations and NGOs Donors offering grants for initiatives	*Normative:* All public contracts require OER-based learning materials. Most NGO- or donor-funded contracts require OER-based learning materials. Many private learning-materials providers are active in the OER field. Procedures exist to reward teachers and instructors for OER-based learning materials through time off or payment for this work.

The question of sustainable business models and funding mechanisms around OER is an important issue at national and institutional levels. At the national level, the issue of sustainable business models must be seen in the broader context of growing participation rates at all levels of education, along with the squeeze of public budgets and private household incomes. This poses major challenges to making the provision of good-quality education affordable. OER can help solve the issue of affordability by addressing the costs of learning materials (see Chapter 2).

The costs of purchasing high-quality learning materials are often spread between governments, learners and their families, with publishers earning revenues to cover their development and maintenance costs. However, there are in fact at least three ways to cover these development and maintenance costs, each of which has an impact on the affordability of the learning materials.

The costs of purchasing high-quality learning materials are often spread between governments, learners and their families, with publishers earning revenues to cover their development and maintenance costs.

Orr et al. (2015) have distinguished three models for cost recovery during the economic lifecycle of OER, each of which can be directly supported through government funding initiatives:

- *Contracts from government or international donors, which mandate that the learning materials provided are openly licensed and therefore OER*. A variation of this is when government provides *seed funding* for a first round of developing OER and expects the content developer to be able to establish a revenue-generating model soon thereafter.
- End-user revenue models selling OER are not possible because the products are openly licensed. However, *producers can provide content for free as OER but offer accompanying revenue-generating services* (the 'freemium model'). This might be supported through government or donor *seed funding*. OpenStax, for instance, generates revenues not from OER but from student-support services such as providing tutorials and handling homework administration (and even these services received some seed funding; cf. Orr et al., 2015; Straumsheim, 2017). A variation of this is that providers offer only some of their learning materials as OER, while the rest are revenue generating. This should not be promoted through a policy, since it is unlikely to prove a sustainable supply of OER in the medium to long term because the incentive of the company remains to generate revenue through content.
- *Community (non-market) production*, where enthusiasts develop OER as a group in their free time. An important aspect of this variation is that community engagement is a scarce resource. In this case, government can support it by recognising and rewarding work undertaken to develop OER through time off from other duties (in the case of civil servants) or by providing a supportive infrastructure and training. An OER repository from Norway, for instance, called the Norwegian Digital Learning Arena, offers secondments to teachers while they are developing contracted content. More generally, the practices of using, creating and sharing OER must be reflected in institutional and sectoral human resources (staffing) policies. Incentive structures should also be designed and implemented that encourage collaborative OER activities, intra-institutionally as well as inter-institutionally.

To implement these models and ensure a broad base for sustainable production and further OER development, the policy masterplan must target engagement activities: with creators of public tenders and donors offering grants for initiatives to adapt contracts to support OER; with private-sector firms and start-ups to adopt innovative business models that allow them to generate a sustainable income while supporting the sharing and adaptation of their own learning materials; with institutions to adapt their staffing and human resource policies to reward engagement with OER; and with civil-society organizations and NGOs to encourage them to support community activities around developing and adapting OER.

The ***indicators*** for this building block are all normative, since the aim of this building block is to change the business models around learning-materials design and development: all (or most) public contracts should require the development of OER-based learning materials, including the encouragement to reuse existing materials first; most NGO- or donor-funded contracts should include the same conditions. Many private learning-materials providers should be active in the OER field, and procedures should exist to reward teachers and instructors for developing OER-based learning materials through time off or special types of recognition/awards.

Promoting evidence-based research on the impact of OER

A significant enabler for an OER policy is research into the real impact of OER initiatives. This is also a contributor to the sustainability of OER initiatives, since research can provide evidence of their impact. Table 13 shows the suggested elements of this building block.

Table 13: Building blocks of OER research

Key building blocks	*What is the aim?* **Objectives**	*What is to be done?* **Main activities and target sectors**	*Who is involved?* **Key partners for implementation**	*How will success be monitored?* **Indicators**
Establishing monitoring and research on the effectiveness of OER use and learning outcomes	To ensure that continual monitoring of the policy's progress is carried out To ensure that adequate levels of research on the impact of OER use exist and can be fed back into OER policy design	Use of indicators as a monitoring scheme Launching of public funding programmes to evaluate the effectiveness of OER usage Institutional-level quality assurance procedures include evaluation of the effectiveness of using various learning materials, including OER. A good-practice database for utilizing OER in teaching and learning is established at institutional, national and international levels.	Creators of public funding programmes (government) Researchers in the independent sector (e.g., in higher education) Repository and learning material database directors International community	*Normative*: A continual monitoring scheme exists. Research studies on the impact of OER are launched in parallel with funding programmes for OER production and reuse. *Quantitative:* Number of research studies investigating the impact of OER on teaching and learning practices Share of learners whose learning has improved through the use of OER (differentiate by focus of study and method) Share of teachers and instructors who integrate OER into the learning materials they use

A policy should evolve over time, with some effects being evident sooner than others. For this reason, it is important to build a framework for maintaining an evidence base around a policy that fulfils the following three goals:

- It informs the governing board and the coordination body as well as other stakeholders about the progress towards achieving the envisaged goals of the policy, through simple monitoring exercises that are regular, transparent and easily accessible.
- It has a research programme for in-depth evaluation of the impact of a policy, including both intended and unintended impacts and an investigation of the assumptions between the plan's vision and implementation.
- It provides a way to discuss changes and modifications to the policy based on the monitoring indicators and the research programme.

The previous building blocks have included indicators that can be used as a basis for monitoring progress. This monitoring scheme should be established on the national level and should report annually to provide progress reports on implementation (see Chapter 6 for more on this).

The monitoring scheme will be largely static, with a focus on measuring change over time. Additionally, it is important to launch a general research programme that ensures the overall changes to teaching and learning are being investigated and the contribution of OER to providing high-quality and affordable learning for all is being measured. Two of the key research questions are:

- What share of learners have experienced better learning using OER?
- What share of teachers and instructors are integrating OER into their learning materials?

Quantitative methods (surveys and data analyses) should be used to show what share of the targeted populations are engaging in OER, and to measure, for instance, improvements in learning outcomes.

A mixed-methods approach should be used here. Quantitative methods (surveys and data analyses) should be used to show what share of the targeted populations are engaging in OER, and to measure, for instance, improvements in learning outcomes. This can be achieved through independent research by actors involved in the policy implementation and through analyses of repository data. Qualitative methods (surveys, interviews, focus groups) should be used to understand how the regulations, activities and behaviours of key actors work together to produce certain impacts – which may support or hinder the achievement of the overall policy goals set in the policy vision. For instance, a survey of Dutch educators showed that academics were reluctant to share and use other people's work (van Acker, Vermeulen, Kreijns, Lutgerink, & van Buuren, 2014). Other researchers (Littlejohn, Falconer, Mcgill, & Beetham, 2014) explained this tendency as arising partly because academics felt reusing others' content might reflect badly on their own expertise and academic identity. The authors concluded that a cultural change to foster the value of sharing would be necessary to encourage sharing behaviour.

Irrespective of the methods, it is useful to ensure that research accompanies OER initiatives. For instance, for quantitative research, it is advisable to administer a pre-test of target learners before the intervention if the goal is to evaluate the impact of OER on learning outcomes (Hilton, 2016). A helpful toolkit for quantitative research has been compiled by the Open Education Group. It provides advice on key questions, research methods and analytical tools for the following topics: the effects of OER adoption on the cost of learning materials to users; the effects of OER adoption on student outcomes; student and faculty use of OER; and student and faculty perceptions of quality (Hilton, Wiley, Fisher, & Nyland, 2016). Box 5.8 provides some additional sources of research.

Box 5.8: Selected sources of OER research materials and data

- *Research on Open Educational Resources for Development (ROER4D)*. A large-scale research programme running from 2015 until 2017, with a focus on OER in the Global South. http://roer4d.org/
- *OER Research Hub*. Ran between 2012 and 2016 as an evidence base for OER, largely but not exclusively focused on the EU and North America. The team continues to work collaboratively on OER-related research and evaluations. http://oerhub.net/what-we-do/current-projects/
- *OER World Map*. A central cartographic source of information on OER activities, institutions and champions across the world. The source is also used to provide OER activity maps for individual countries (e.g., Germany). https://oerworldmap.org/
- *OER Knowledge Cloud*. The OER Knowledge Cloud is updated regularly by professional librarians and by volunteers. It is hosted by Athabasca University, Canada. https://oerknowledgecloud.org/
- *Open Education Group*. The Open Education Group is an interdisciplinary group based at Brigham Young University focused on gathering and executing research related to OER and improving education. https://openedgroup.org/

A combination of the monitoring scheme and the research programme can also be used to assist the global monitoring initiative being established by UNESCO. Box 5.9 highlights the three conceptual domains covered in this initiative. Policy designs that include the indicators for each of the building blocks above and launch a national research programme to provide data on OER engagements would allow comparison and benchmarking for individual countries.

Box 5.9: The OER Global Monitoring Initiative

The OER Global Monitoring Initiative is being developed by UNESCO to make countries' activities in the field of OER transparent and to enable both benchmarking and peer learning between countries, so as to foster increased engagement in OER for the achievement of the SDGs (especially 4 and 5). The monitoring scheme is divided into three conceptual domains.

	Conceptual Domains		
	Government Commitment	***Institutional Adoption***	***Teaching and Learning Impact***
Benchmarks	Governments in Member Countries have deliberate policies, strategies or programmes in place to create the enabling conditions for OER use across their national or provincial education system and in support of formal, informal and non-formal learning.	Institutions in Member Countries have deliberate policies, strategies or programmes in place to create the enabling conditions for OER use across their campuses.	Governments in Member Countries perceive progress with respect to the availability, quality and affordability of education and learning materials, the quality of teaching and learning in institutions where OER has been adopted, and the use and sharing of OER by educators.
Concepts to be measured	• National/provincial OER policies, strategies or programmes in place • Government commitment to enable OER (repository; funding; open licensing; quality assurance mechanisms; OER capacity building/ training)	• Institutional OER policies, strategies or programmes in place • Institutional endorsement and/ or adoption of OER products	• Contribution of OER to solving specific education challenges • Contribution of OER to impacting teaching and learning • Training of educators on OER (proxy for OER use) • Sharing of OER by educators

The ***indicators*** for this building block are normative: there should be a continual monitoring scheme, and research studies on the impact of OER should be launched in parallel with funding programmes for OER production and reuse. The quantitative indicators – the share of learners whose learning has improved using OER, and the share of teachers and instructors who integrate OER into the learning materials they use – should be covered by this combination of monitoring and research plan.

Governance mechanism of the OER policy

This is the most important building block of the OER policy. Implementation of the policy at any level depends on who is responsible and accountable for monitoring progress and ensuring follow-up mechanisms are used. A structure for setting up a high-powered group to oversee and monitor the implementation of OER policy should be included within the policy to give it legitimacy and ensure the opportunity for taking appropriate action. Table 14 shows the basic elements of this building block. The significance of this building block warrants an extensive treatment of governance issues in Chapter 6.

A structure for setting up a high-powered group to oversee and monitor the implementation of OER policy should be included within the policy to give it legitimacy and ensure the opportunity for taking appropriate action.

Table 14: Building blocks of governance

Key building blocks	*What is the aim?* **Objectives**	*What is to be done?* **Main activities and target sectors**	*Who is involved?* **Key partners for implementation**	*How will success be monitored?* **Indicators**
Setting up of a governing body to oversee and monitor the implementation of OER policy	To align the OER policy with existing policies, strategies or relevant regulatory frameworks To coordinate the adoption of new regulatory frameworks To prioritize and allocate budget to various projects for OER To develop standards and quality measures for OER To monitor the progress of OER and make course corrections	To ensure enabling regulatory frameworks and policies are in place Create an overarching role to oversee and monitor policy implementation Develop annual plans and allocate funds Consult experts to develop guidelines and facilitate capacity building Review reporting and decide on policy adjustment	High-level empowered committee reporting to the minister or permanent secretary for national policy High-level committee reporting to the top leader or the managing body in the case of institutional policy	Frequency of meetings Action taken by the governance body to achieve the objectives of the policy

Phase 5: Constructing the masterplan

This chapter has presented the eight main building blocks that an OER policy should cover. In each case, it has made suggestions on the activities to be launched, the stakeholders to be involved and the indicators to be used to measure success. The policy-maker's task at the end of this chapter is to localize these suggestions for their own case.

You are now asked to fill in Table 15 with localized objectives, indicators, activities and actors. Be as specific as possible and include quantitative and normative indicators to measure success.

Table 15: A summary view of the OER masterplan

Key building blocks	*What is the aim?* **Objectives**	*What is to be done?* **Main activities and target sectors**	*Who is involved?* **Key partners for implementation**	*How will success be monitored?* **Indicators**
Adopting an open licensing framework				
Ensuring integration of OER at the level of curriculum development				
Ensuring development, storage and accessibility of OER				

Key building blocks	*What is the aim?* **Objectives**	*What is to be done?* **Main activities and target sectors**	*Who is involved?* **Key partners for implementation**	*How will success be monitored?* **Indicators**
Aligning quality assurance procedures				
Supporting capacity building and awareness raising				
Encouraging sustainable business models and launching funding strategies				
Funding research on the effectiveness of OER use and learning outcomes				
Setting up a governing body to implement OER policy				

Reassessing previous planning steps

Has this more operative planning phase led to any necessary changes to the vision (Chapter 2) or the scope and scale of the policy (Chapter 3)? Was anything missed in the initial gap analysis (Chapter 4) that should be covered to ensure the building blocks are realistic? Make modifications to the previous phases, as necessary.

Chapter 6

Planning for governance and implementation

Overview

The governance and implementation plan is the high-level administrative and operative strategy behind the policy. It is about how the policy set out in the masterplan will be governed and executed to secure the engagement of key stakeholders and to set performance indicators for monitoring progress. The implementation can take a top-down or bottom-up approach, or a mixed approach covering both methods to balance enablement, encouragement and enforcement. The implementation plan needs to be put into action through a governing board and/or a coordinating body that represents all major stakeholders. At the close of this chapter, the policy-maker will have specified an implementation plan consisting of the major components of policy execution.

After reading and working through this chapter, you are expected to be able to:

- ***Identify different approaches to policy implementation***
- ***Choose the specific approaches and investment commitment needed to implement the OER policy***
- ***Take steps to organize consultations with the different stakeholder groups to elicit their comments and incorporate their feedback into the OER policy***
- ***Develop specific targets to monitor the implementation of the OER policy***
- ***Set up an owner-accountable organizational structure for governance and coordination***

Implementation as a collective process

In Chapter 5, the masterplan was defined based on decisions related to each of the eight key building blocks. Together these building blocks make up the policy to be carried out. The objectives, the main activities, as well as the implementing agencies and stakeholders involved have been identified for each of the building blocks. The implementation plan sets out how this programme can be put into action.

This implementation plan must be prepared and executed collectively, since the masterplan involves stakeholders at different levels (national, institutional, individual) and in different sectors of the educational system. Furthermore, policy implementation cannot be organized solely on the basis of existing divisions of responsibility but often requires reflection on organizational structures, and the dynamics of or barriers to their interconnections. In some cases, the government or institution may need to realign the existing organizational structure or, more radically, establish new agencies or units to steer the implementation of the policy and coordinate all implementing agencies and key partners.

The key elements of the implementation plan include:

- Establishing an appropriate implementation method
- Determining budgets and the implementation schedule
- Planning partner engagement
- Setting up an organizational structure for policy governance and coordination
- International collaboration for promoting peer learning and exchange of ideas

These five topics will be covered in this chapter.

Establishing a balanced method of implementation

It is common to consider policy implementation an administrative activity; the decisions have been made (in the masterplan), and now the policy must be executed. However, the process of change envisaged by the policy must be coordinated and controlled so that all elements of the masterplan can work together to the benefit of policy success. So a first consideration is how to ensure the right balance between top-down and bottom-up implementation. Top-down and bottom-up methods have their benefits, but these can be brought together in a mixed approach that aims to find the right balance between the two (cf. Cerna, 2013; Matland, 1995).

- **Top-down approach**: A top-down approach to public policy can consider all the success factors necessary for good practice, so it should provide a systemic approach to implementation. It also has the advantage of being able to use the tools of regulation, enforcement and resource allocation to push certain activities and behaviours. For this reason, it is particularly appropriate in situations where the envisaged practice is considered by many in the field to be contentious or of little value – i.e., where there is little direct self-motivation to build on. The disadvantage of this approach is that it works on the assumption of a generalist theory of change, which may neglect important contextual factors for success. This might be particularly harmful to an OER policy that has at its core the objective of improving teaching and learning through new applications of OER and new developments around OER. The top-down approach can only support this if such exploratory initiatives are explicitly encouraged. Additionally, a top-down approach may be blind to OER practices already occurring in the field, so it cannot harness them or learn from them.
- **Bottom-up approach**: The starting point of this approach is to support practitioners in the field, often through one-off funding or regular budget allocation. The clear advantage of this approach is that it can benefit from the self-directed motivation of the initiators and their networks and is very focused on specific contexts in the field. This approach must then adopt activities to spread practices from a small group of active enthusiasts to the mainstream. An important additional point, which may be overlooked from the perspective of this approach, is that practices involving OER

may be inhibited or even restricted through regulations and accepted codes of practice that can only be adapted at the national level of the education system. Furthermore, bottom-up approaches have the disadvantage that they tend to lack a systematic view of the whole policy implementation process, being focused on their own context of practical implementation in the field (e.g., in their own institution or community).

- A **mixed approach** will take account of the advantages and disadvantages of the two other approaches. OER is an instrument of reform, so while the goals for the policy might be clearly set in the vision statement (Chapter 2) and transformed into building blocks of the masterplan (Chapter 5), some of the indirect effects of the OER policy may be unknown. Therefore, it is necessary to ensure two things in the final approach:

    a) That the key stakeholders feel ownership for the policy implementation and are motivated and engaged to act, partly through changing their own behaviours
    b) That the process of change is coordinated and controlled, so that all elements of the masterplan can work together to achieve policy success

The actual mix of the two main approaches is determined by the context: where many changes are necessary to start any major OER activities (i.e., the gap revealed in the gap analysis is high – see Chapter 4), the top-down approach will play a more important role in the first phase of implementation than the bottom-up approach, which starts out from practice in the field. When there is not yet enough information available to build a comprehensive and large-scale higher-level policy, the policy usually starts with a smaller-scale OER piloting programme (see Chapter 3). But when policy-makers mainstream the bottom-up innovations to the national level, changes to national policy and the regulatory framework will be necessary.

When policy-makers mainstream the bottom-up innovations to the national level, changes to national policy and the regulatory framework will be necessary.

The case of Brazil provides the example of a policy focused on the top-down approach at the start while neglecting the potential for bottom-up support of existing initiatives (see Box 6.1). The case of the Open Textbook Project, in Canada, shows how important bottom-up initiatives are (see Box 6.2).

Box 6.1: Establishing a law is just the beginning of the process, as shown in Brazil[66]

Brazil is a country with strong champions for OER. However, early on, most effort was directed at top-down activities in the form of policy-making. As a result, many law proposals were drafted at the federal, state and municipal levels (as in the case of the adoption of an open licence by the Education Department of the City of São Paulo), but practical implementation was of limited success. Implementation, according to those involved, has been hindered by limited funding and the resulting inability to plan for long-term projects and systemic activities.

A change in approach, focusing on bottom-up advocacy, led to significant breakthroughs. The small group of advocates began working with middle-level managers and public servants who were aware of and motivated to push the OER agenda forward. In 2017, the Open University of Brazil (a system comprised of 120+ public higher education institutions) adopted an open-licence policy for all its resources. And in May 2018, the Basic Education Secretary passed an ordinance that any educational resources commissioned and paid for by the ministry and to be used for basic education (K-12) should be OER that grant permission for anyone to 'access, use, adapt and distribute at no cost'. The champions argue that this recognition of OER's potential for impact should now continue to be met with policy support that takes a more pragmatic approach than with earlier project funding and builds instead on the advocacy and engagement for OER at institutional and individual levels (i.e., from the bottom up).

66 http://aberta.org.br/continuingstory/

Box 6.2: Eight patterns of adoption, based on the British Columbia Open Textbook Project (since 2012)

An analysis of the self-reporting of open textbook adoption by all initiatives within the Open Textbook Project provides a typology of adoption patterns, as described below (Barker et al., 2018):

1. Stealth adoption: the open textbook is used by students but not discussed or made public to third parties (e.g., it is used as a supplementary material).
2. Course developer adoption: a course developer is the advocate for using open textbooks and influences their adoption for new or revised course provision.
3. Inter-institutional carrier infection: an OER champion changes institution and brings his /her support for OER, thus influencing members of the new institution.
4. Creation and adoption: adoption of OER comes through the motivation to fill a gap in the available learning materials.
5. Lone adoption: one person continues to use OER but is not able to infect or cross-pollinate other parts of her/his own organization or others'.
6. Infection: one educator (a 'champion') adopts an open textbook, and others follow this example.
7. Committee adoption: a collaborative effort is undertaken to develop a new standardized open textbook, and many people are involved in this process.
8. Sanctioned exceptional adoption: an open textbook is accepted alongside the standard (pre-existing commercial) textbook.

The key requirement of the mixed approach is that each activity in a building block of the masterplan should now include the answer to these three questions regarding the implementation strategy:

- What is going to be ***enforced*** in this building block (e.g., through a legal regulation)?

  This is a top-down question that aims to ensure certain activities or behaviours really happen – for instance, that initial teacher training includes a course on using OER.

- What is going to be ***enabled*** in this building block (e.g., through improving the infrastructure or offering new support structures)?

  This is a top-down question because it will require central investment – for instance, providing better ICT infrastructures in schools. But it is also a bottom-up question because it doesn't enforce an activity but aims for the right framework conditions to allow it to happen – for instance, providing additional continuing education courses on the use of OER that are accessible to anyone who is interested.

- What is going to be ***encouraged*** in this building block (e.g., through rewarding certain actions or making them more visible)?

  This is a bottom-up question because it starts from the assumption that teachers and learners would like to use and create OER but need more encouragement. It is particularly about spreading the base of users beyond the first innovators.

This mixed approach therefore requires making links between the various elements in the masterplan – e.g., enforcement through a regulation to make all publicly funded learning materials open licence does not do anything to ensure these new OER will be used in practice, unless efforts are made to provide infrastructure support. Moreover, other elements in the masterplan may act as enablers (e.g., by providing training on how to use OER), and still others may act as encouragers (e.g., by rewarding educators for creating and using good OER).

Allocating resources and setting KPIs for implementation

An implementation plan should be very specific about the budget provided for implementing each of the building blocks, should set milestones for when the objectives in each of the building blocks should be complete, and should use time- and goal-based KPIs (key performance indicators) to enable the monitoring of progress.

These three steps should be carried out sequentially:

1 The first step is to review the budget available in connection to the estimated costs of implementation. Estimating costs in the masterplan is vital for three interconnected reasons:

- *Keeping the masterplan realistic.* If the estimated costs appear too high, it may be necessary to review the activities in the masterplan, mobilize more funds and reduce the scale of the activities, or postpone their implementation in the first round of policy implementation.
- *Prioritizing.* Aligning a cost to each activity facilitates prioritization, since the overall budget given to policy implementation is likely to be limited. It leads to questions about which activities are vital for achieving the overall policy goals – now or in the future.
- *Future planning.* The estimated costs will provide a basis for discussing whether any activities are considered too expensive for the present policy or where future investment might be tied to first results from the initial implementation phase of the policy.

2 The second step is to set an implementation deadline for each of the activities in each of the building blocks. The deadlines should fulfil the following conditions:

- Dates should be aligned to budget or annual financial reviews, so that budgetary plans can be set against them.
- Short-term (e.g., in two years), medium-term (e.g., in five years) and long-term (e.g., in ten to fifteen years) goals for each of the objectives in each of the building blocks should be set.
- Explicit milestones for achievement should be set.

3 The third step, which is interconnected with the others, is to set KPIs. These should fulfil the following criteria:

- KPIs should be based on the indicators noted for each of the building blocks.
- KPIs should assume a specified level of growth (for quantitative indicators) or the fulfilment of a specific condition (for normative indicators) within a specific period of time. For instance, the awareness rate of teachers in secondary schools is on average twenty-five per cent within two years of policy implementation; or alternatively, the awareness has grown fifty per cent in comparison with one year before policy implementation.
- KPIs should be aligned with consequences for further policy implementation – i.e., non-achievement requires a review of the policy implementation and perhaps contracting further research to understand how the policy is received in practice.
- A monitoring report with results for the KPIs should be submitted to the governing board for review and published annually.

These three steps will lay the basis for an annual monitoring plan that reviews implementation annually and can be used to review and change the implementation plan.

Planning a partner engagement strategy

Policies fail for three main reasons: unrealistic objectives, lack of ownership and misunderstanding of the policy aims. A strategy for wider consultation and stakeholder engagement is critical to gain their buy-in.

Policies fail for three main reasons: unrealistic objectives, lack of ownership and misunderstanding of the policy aims. A strategy for wider consultation and stakeholder engagement is critical to gain their buy-in. A consultation process helps achieve the following objectives:

- To gain early insight into areas where the policy is too ambitious or requires more support and investment to ensure success.

  A policy is always a 'theory of change', which starts out from an aim and designs the steps towards achieving this. This 'theory' is never going to be perfect and will need adaptation along the way.

- To ensure that the stakeholders have been equipped with the right competencies and are not inhibited in their actions by framework conditions.

  For instance, asking teachers to use a new central repository to search for OER or to adapt OER developed by others without ensuring that they receive training, support and encouragement to do this is unlikely to change their actions much.

- To ensure that the stakeholders involved in the implementation of the policy are well informed about the policy, its aims and the whole masterplan.

  For instance, if the quality assurance agency is adapting

the quality assurance procedure to allow OER to be used in classrooms, it is important that the agency understand the full rationale for this adaptation. It is not simply to allow a new type of learning material but to include new methods of assuring quality that are appropriate to learning materials that will be changed regularly. Additionally, to be fully effective in changing teaching and learning practices in all school classes, a policy for capacity building should integrate OER into initial teacher training and further professional development courses.

In the masterplan (Chapter 5), the key stakeholders are already identified. The following are five stakeholder groups for consultation. The roles of these stakeholder groups in policy implementation are two-fold: they will be involved with particular topics for the purposes of consultation and advice, and they will be responsible for implementing certain tasks detailed in the masterplan.

- **Representatives of organizations with regulative authority and/or the instruments to set funding incentives.** These can be organizations that regulate, directly or indirectly, the educational system, such as ministries responsible for education, quality assurance agencies, and sectoral organizations responsible for professional development. Additionally, this group should consider organizations (public, private, donor) that create contract tenders for learning materials or support the further education of teachers and instructors. This group should consist of experts on education but also on the legal framework in education so they can assist with developing an open licensing framework at the national level.

  Their role for implementation is to endorse OER-based learning materials and to enable the use of OER in practice. They can also provide funding to support the creation of OER and capacity-building measures for teachers and learners.

- **Representatives of user groups.** These can be educational institutions and their leadership; private companies that produce OER-based learning materials; teachers and instructors as the direct users in a study-course setting; and librarians, who often support teachers, instructors and students with finding OER and offering courses that introduce people to the practices around OER use.

  Their first role in implementation is to provide insights into teaching and learning practices, specifically into how OER are used, what kind of metadata would be helpful for discovery, and the appropriate user interfaces for repositories. In many cases, there will already be some active users of OER in the environment for which the policy has been developed, and their insights can help to ensure that OER reach the mainstream. In the active implementation phase, they will be the ones discovering, creating and using OER. They will also be involved in capacity-building efforts.

- **Representatives of technical supporting structures.** This group should include the (current or future) repository managers and their staff, who are involved in providing the digital backbone for OER discovery, storage and use. The group can include IT managers from different educational institutions. The people involved should represent both national and institutional levels.

  Their role for implementation is to ensure that a digital infrastructure is available for the discovery, storage and development of OER, including providing metadata and enabling peer assessment of the quality of resources.

- **Representatives of research and evaluation initiatives.** This group should include persons who have developed the monitoring mechanisms for the OER policy; it might include some people from the research community who are familiar with the challenges associated with OER policy and practice.

  Their role is to prepare a monitoring system that develops specific indicators based on the requirements from the masterplan and to use first insights from the monitoring and other research to improve the implementation methods used by the policy.

- **Representatives of the international community.** This group should include individual experts or representatives of organizations such as UNESCO and COL who have already acquired expertise in OER policy design and practical implementation. Furthermore, in the spirit of peer learning, this group might include other policy-makers who are working or have worked on OER policy design and practical implementation.

  Their role is to provide an opportunity for exchange and collective learning on how to design and implement an OER policy effectively.

The methods for securing the engagement of these groups can be various and should be chosen based on these objectives: to use key informants to determine what is realistic for policy implementation, to ensure that the planned activities will provide the key stakeholders with capabilities and rights, and to ensure that the stakeholders are informed about the goals of the policy. Suggested methods are:

- A wide public consultation (online surveys, opinion seeking)
- Focus groups for more in-depth discussions on specific issues
- Interviews with key stakeholders
- Continuous knowledge sharing through newsletters, workshops or seminars
- Membership of the coordinating body

The process can be organized by the steering body set up in the masterplan or be managed independently, e.g., by a research institution.

Setting up an organizational structure for policy governance and coordination

The masterplan details the activities for each of the building blocks. Implementation will use a balance of top-down and bottom-up methods, which involve the key partners and stakeholders to achieve specific objectives measured through KPIs. These processes all require an organizational mechanism for governing the policy and coordinating various activities.

As mentioned above, governance and coordination must be organized centrally and should be closely linked to the formal organizational structure of the educational system (e.g., directly aligned with the education ministry). The organizational structure should consist of multiple interlinked parts:

- A central governing board charged with commanding, supporting and overseeing the policy implementation
- A coordination body delegated to manage partners and collaboration
- A task team of people charged with implementing the policy

The governing board must include the necessary competencies to ensure realistic and successful implementation. It will lead and monitor the policy implementation by establishing strategic directions, ensuring the policy's compliance with overarching laws, standards and procedures, leading execution and managing risks.

Most importantly, a comprehensive set of integrated principles on policy governance should be developed and consistently applied to allow the governing board to assume ownership and accountability. The principles should start by recognising the fundamental reasons that the board was created and the nature of its authority. The policy should also specify a number of principles to enable accountable leadership by the board.

The governing board should fulfil the following criteria:

- It should receive a clear endorsement from the highest level in the hierarchy (e.g., cabinet, minister, president or head of the educational institution), granting it ownership of the policy and making it fully and directly accountable for the processes and products of governance.
- It should have a clear mandate, approved by formal authorities, to command, oversee and support the implementation of the policy.
- The governing board should include representatives from formal authorities (ministries, quality assurance agencies, heads of educational institutions) that are able to make changes to the regulations at the institutional and/or national level (i.e., to impose parts of the policy framework from the top down).
- The governing board should be made up of permanent members for a period that covers policy design and at least one year of implementation. After this period, membership can be reviewed and changed if necessary. The board should not be too big (e.g., not more than six persons) and should be supported through sub-structures for specific tasks, if necessary.
- The coordination body, often associated with the governing board, should include representatives from key stakeholders who represent users of OER (teachers, librarians, learners) and enablers (e.g., repository managers), and who understand the context and can help form a realistic implementation programme (i.e., encourage bottom-up effects). It can include experts and advocates across all levels of the educational system (e.g., in the sense of a task force). The governing board will delegate it (1) to support and coordinate policy implementation through targeted interventions appropriate to the objectives, and (2) to facilitate collaboration between stakeholders and OER users. It should meet regularly with the persons responsible for operational implementation to discuss execution, review the results of impact monitoring, and make necessary changes to the policy objectives, budget provisions and/or timing of implementation.

The task team given the responsibility of implementing the policy should be endorsed by the highest formal authorities for this task. They will work intensively on initiating the necessary processes for each of the building blocks, specifically for ensuring that enforcing, enabling and encouraging processes are initiated, as per the planned implementation.

Making use of international collaboration

As described in Chapter 1, many countries and international organizations are currently implementing OER-related policies and strategies. This provides a huge resource for the policy-maker. This should be harnessed to exchange plans for and experiences of policy implementation. The situation provides the opportunity for policy-makers in different countries to collaborate more directly with each other either bilaterally or multilaterally.

Peer networks can share experiences and good practices with each other, ensuring that each new policy implementation and each new phase of development can benefit from

previous ones. Moreover, similarities between policies might provide an opportunity to share resources for the implementation of technical infrastructures, such as repositories, or for common capacity-building programmes.

International organizations such as UNESCO and COL welcome and support such initiatives. A central community-developed resource for finding policies and initiatives around the world is the OER World Map, with over 2,500 entries on OER-related activities, organizations and champions across the globe.[67]

Phase 6: Determining the implementation plan

This chapter has presented the five components of the policy implementation plan. This plan has the operational task of using specific methods, allocating resources, involving stakeholders and coordinating the execution of the masterplan. It aims to make full use of top-down steering while encouraging and amplifying bottom-up activities. It also facilitates coordination and consultation between the layers of central policy planning and implementation in the field, which by working together will secure successful implementation. The policy-maker's task at the end of this chapter is to localize each of these components for their own case.

Aligning the implementation strategy with the building blocks in the masterplan

Table 16 is like the tables in Chapter 5. It includes all of the building blocks but now has new columns on the implementation method, resources, timing and KPIs. You are asked to fill in the table with localized entries related directly to your policy. Be as specific as possible, and include quantitative and normative indicators to measure success.

Table 16: Summary view of the implementation plan for the OER policy

Key building blocks and their objectives	**Objectives**	**Implementation method used to achieve each of the objectives** *(enforce, enable, encourage)*	**Budget per activity**	**Budget source**	**Milestones** *(dates and steps)*	**KPI** *(specify indicator and type of change expected)*
Adopting an open licensing framework						
Ensuring integration of OER at the level of curriculum development						

67 See https://oerworldmap.org.

Key building blocks and their objectives	**Objectives**	**Implementation method used to achieve each of the objectives** *(enforce, enable, encourage)*	**Budget per activity**	**Budget source**	**Milestones** *(dates and steps)*	**KPI** *(specify indicator and type of change expected)*
Ensuring the development, storage and accessibility of OER						
Aligning quality assurance procedures						
Supporting capacity building and awareness raising						
Encouraging sustainable business models and launching funding strategies						
Funding research on the effectiveness of OER use and its learning outcomes						
Setting up a governing body to implement the OER policy						

Methods of implementation and partner engagement

For each of the three methods of implementation, explain the methods and instruments for implementation that will be used, and provide details on how partner engagement will be secured.

Guiding questions:

1 ***Enforcing mechanisms*: Which methods and instruments will be used, and how will partners be involved in the implementation process?**

This question should be answered for each of the building blocks, and any links between building blocks and between mechanisms should be noted.

2 ***Enabling mechanisms*: Which methods and instruments will be used, and how will partners be involved in the implementation process?**

This question should be answered for each of the building blocks, and any links between building blocks and between mechanisms should be noted.

3 ***Encouraging mechanisms*: Which methods and instruments will be used, and how will partners be involved in the implementation process?**

This question should be answered for each of the building blocks, and any links between building blocks and between mechanisms should be noted.

Membership and responsibilities of the governing board and the coordinating body

It is important to formulate a clear mandate for the governing board and/or coordinating body that is made publicly available. This mandate should contain answers the following seven questions:

1 Who will appoint and endorse the governing board/ coordinating body?

2 Which representatives of the relevant formal authorities will be members?

3 Which key stakeholders representing users of OER (teachers, librarians, learners) and enablers (e.g., repository managers) will be members?

4 How long will the first mandate last? When will the mandate be reviewed?

5 How many members will it have?

6 How regularly will the body meet?

7 How regularly will it provide feedback based on monitoring and research to the implementation team and the user community?

Reassessing previous planning steps

The task of the implementation plan is to describe an operative strategy for launching and executing the policy as it was set out in the masterplan. This process may have led to reconsiderations for the masterplan or previous phases. If this is the case, return to these previous phases and make the necessary adjustments.

Chapter 7

Launching the OER policy

Overview

After completing the planning phases, the policy will go through an endorsement and launching process. Launching a policy is an event or a process supported through a communication strategy to ensure that stakeholders and the public are sufficiently informed about the goals of the policy and the planned activities within the masterplan. It is also a learning process that is open to change and modifications to streamline implementation and improve policy impact. This work will be implemented through the coordinating body (Chapter 6) and informed through consultation processes and feedback loops, which are embedded into the launch of the policy. A review of implementation and its impacts should lead to a discussion of what shape the next-generation policy should take and how the scope and scale of this policy can be extended.

After reading and working through this chapter, you are expected to be able to:

- ***Develop a communication strategy to promote awareness of the OER policy***
- ***Take steps to facilitate launch events***
- ***Make arrangements for streamlining policy implementation***
- ***Develop a strategy to build an evidence base that can feed into the monitoring and evaluation of the OER policy implementation***

Endorsing and launching policy as a learning process

The policy needs to be endorsed at the highest level in the country/institution to give the scope for its implementation. It should also be ensured that the launch is not the end of the policy process but just one phase in a longer-term implementation and learning process. To achieve this, the following components must be integrated into the launching phase:

- A final review of the masterplan and implementation should be carried out, and the full policy document should be used to gain high-level policy endorsement (e.g., from the cabinet, minister, president or institutional leader[s]).
- A communication strategy must be designed to ensure that those playing key roles in the policy implementation (in planning for and actually creating and using OER) are sufficiently informed about the expectations of the policy.
- During implementation, the impacts on OER production and use and on OER-related practices should be observed and these insights used to further streamline and improve the policy.
- Finally, the experience with implementation of the policy should provide the necessary insights for a discussion on how to mainstream OER in the longer term.

These four components will be presented and discussed in this chapter.

Finalizing the policy document and securing endorsements

In the previous chapters, policy-makers were expected to complete tasks as steps towards a completed overall policy document. At the end of each of chapter, each planning phase included reviewing what had been decided in the previous phase and making appropriate modifications. At the end of this finalizing process, a full policy should have been developed and must be laid out as a document.

While the format of the policy document may take the standard template/format used in a country/institution, the document should contain the following sections:

- Policy vision – explaining how the policy will achieve improvement in the challenges associated with SDG 4 (education) and any other SDGs, and what role OER will play in reaching this goal (Chapter 2)
- Policy framework – detailing the scope and scale of the policy, i.e., which levels and sectors in the educational system will be directly included in the policy and whether there will be themes linking them (e.g., lifelong learning or ICT in education; Chapter 3)
- Gap analysis – assessing the current gaps on which the policy must focus to achieve the policy goals (including awareness about open licensing, deficits in access to high-quality learning materials, gaps, and structures enabling OER use; Chapter 4)
- Masterplan – aligning the objectives of the building blocks in the policy with activities, stakeholders and progress indicators (Chapter 5)
- Implementation plan – presenting the methods, resources and schedule for executing the policy and how stakeholders will be involved in the achievement of the policy goals (Chapter 6)
- Launching strategy – this chapter (see below)

It should be written in clear, simple language to ensure that as many people as possible read and take note of it.

The document will need to be endorsed by the highest authority relevant to the scope and scale of the policy. For an inter-sectoral policy (i.e., covering different educational sectors or levels), it might be appropriate to include endorsements from high-level people from each of these sectors. The endorsements should be clearly shown in the document. The persons endorsing the policy can also be asked to support the communication strategy.

Integrating launching events as a key component in a communication strategy

The implementation of the policy has been planned in the previous steps. The challenge is now to transform the plan into action. The first step is to ensure that sufficient information is disseminated about the policy, its goals and the plan of action, since the policy will only have an impact if people know about it – i.e., if they comprehend the policy (Vedung, 1997). It will also be important to secure an adequate level of official endorsement for the policy, which will emphasize its significance within the policy setting.

Raising public awareness of the relevance and potential benefits of OER adoption is essential to gain support for the launch of the finalized OER policy. Ideally, this awareness raising should go beyond the direct stakeholders or key champions involved in the previous stages of policy development (i.e., in the coordinating body and involved in the masterplan). This is because when many people work together for the OER policy, it will really be capable of affecting the mainstream.

Effective strategies to raise awareness consist of providing information on the OER policy in different formats, each of which focuses on the interests and responsibilities of different people in the educational space. It also makes quite a difference whether the stakeholder group is some form of collective decision-making organization (e.g., an educational institution or a ministry) or a collection of individuals. In both cases, it is important to provide a message relevant to the group. However, in the former case, it is very important to target the message to key decision-makers in the organization (e.g., institutional leaders), while in the latter case, it is important to spread the message as widely as possible.

Using diverse media forms is recommended to inform these (and other) groups on the policy. For instance:

- Launch events for key stakeholders
- Poster campaigns in educational institutions, focusing on key benefits of the OER policy
- Social media campaigns with short videos highlighting OER use by champions in a national setting
- Webinars and network events

The launch event provides the chance for the general public to be officially informed of the new policy but is likely to be focused on the interests of institutional leadership. The event should be opened by one of the key endorsers of the policy to underline the government's commitment to the policy and to underscore the overall impact expected from the initiative. Table 17 presents some recommendations for the communication strategy.

Table 17: Suggested focus issues for different stakeholder groups

Aggregate level	Main activities related to OER	Main themes for the information strategy on OER	Information events
National National policy-makers and leaders of central institutions responsible for the education system	OER policy development and implementation within the context of national education policy and regulations	Open licensing regulation Next for capacity-building across the system/institution Quality assurance framework Impact of OER on teaching and learning	Launch event with key endorser and institutional leaders Information focused on the national-level context
Institutional Leaders of educational institutions	OER practice in relation to teaching and learning provision and coordination at the institutional level	Capacity building OER creation and sharing incentives OER repositories	Launching event with key endorsers and institutional leaders Information focused on institutional settings and existing use cases High-level webinar to provide support and initiate peer learning
Individual Representatives of individual teachers and learners	Use, creation and reuse of OER in the context of their own teaching and learning practices	Content development, sharing and collaboration between professional instructors Using OER as didactic instrument	Poster campaign in educational institutions, focusing on key benefits of the OER policy Social media campaign with short videos highlighting use cases from OER champions in a national setting Webinar, workshop and network formats to provide support and initiate peer learning

In the German case, the policy-maker took the view that the implementation would be best supported through individuals and institutional leaders, so it established a central information point for the dissemination and exchange of knowledge related to OER – see Box 7.1.

Box 7.1: The German OER Information Point 'OERinfo'[68]

A major outcome of the OER funding programme in Germany has been the establishment of a central information point that provides high-quality information on OER (Orr, Neumann, & Muuß-Merholz, 2017). The 'Information point OER' (Informationsstelle OER – OERinfo) is maintained by a multi-institutional team led by the German Institute for International Educational Research. A core editorial team is provided by the Jöran & Konsorten agency, which contributes blogposts, podcasts, video interviews and other current status information on the state of OER in Germany and worldwide.The German Institute for International Educational Research provides project management, additional editorial support as well as technical implementation and hosting.

The connection to the established educational sectors is guaranteed by four transfer partners, who are established educational players in different educational sectors: the FWU-Institute for the school sector, the Learning Lab of the University Duisburg Essen for the higher education sector, the Federal Institute for Vocational Education and Training for the TVET sector, and the German Institute for Adult Education for the adult learning, further education and training sectors. Acting bi-directionally, the transfer partners use their established networks to disseminate information from OERinfo into their respective educational sectors and collect information relevant to OERinfo within their sectors.

Additionally, the OER World Map project, driven by the North Rhine Westphalian Library Service Centre, provides data and information on OER actors and activities with a special focus on Germany.

Streamlining implementation during and after the launching process

Policy implementation should be a learning process, so two conditions should be fulfilled:

- The policy development process must be open to review and modification.
- Monitoring and research must be communicated strategically and must reach the decision-makers.

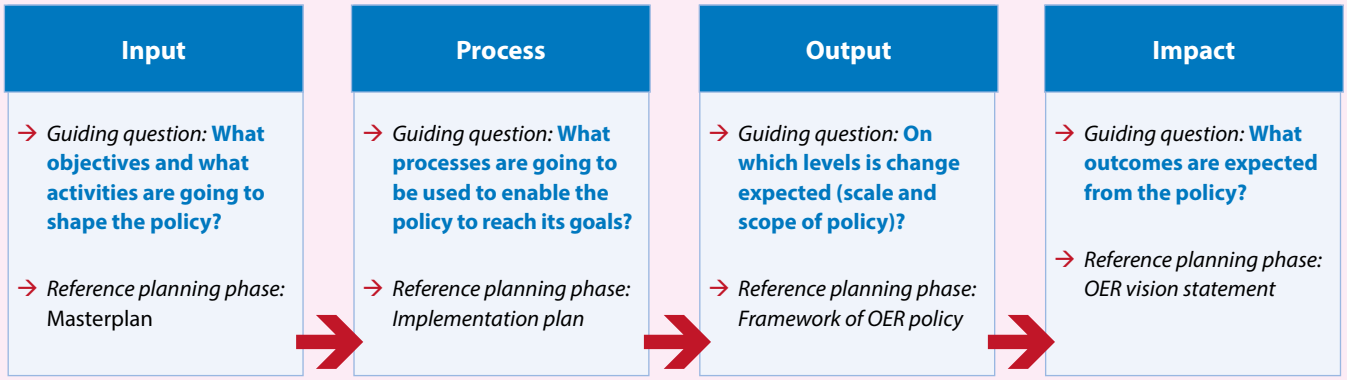
This is a process issue. The policy should be designed to be open, and feedback loops (i.e., monitoring, research and their reception) should be integrated within the masterplan (see the building block 'Establishing monitoring and research on the effectiveness of OER use and its learning outcomes' in Chapter 5). This work will be overseen by the central coordination body (see Chapter 6).

The policy should be designed to be open, and feedback loops (i.e., monitoring, research and their reception) should be integrated within the masterplan.

Used well, this will lead to streamlining of the whole policy, with its connection of inputs, processes and expected outputs. This involves linking various components of the whole policy to investigate how well they are producing the expected results. Figure 13 presents a scheme for use in analyses of streamlining, based on a 'theory of change' (Rogers, 2014) and with reference to the planning phases in these guidelines.

68 https://open-educational-resources.de/

Figure 13: Scheme for use in streamlining the OER policy



Source: Authors

As discussed in Chapters 5 and 6, monitoring indicators from the annual reports can be used here but might need to be supplemented through independent research. This can be research from within the national setting, but international collaboration can also be helpful. The initiative ROER4D (Research on OER for Development) took the collaborative nature of OER as an inspiration to establish a collaborative network of researchers from the Global South to provide empirical evidence of OER adoption and impact in developing countries. They recognized the challenge of linking research to policy and developed a specific strategy focused on visibility, knowledge generation and networking to ensure the research programme remained dynamic and the research message was being discussed at many levels (see Box 7.2). Such strategies are necessary to ensure that the feedback loop reaches both policy-makers and practitioners and can therefore improve the OER impacts.

The initiative ROER4D (Research on OER for Development) took the collaborative nature of OER as an inspiration to establish a collaborative network of researchers from the Global South to provide empirical evidence of OER adoption and impact in developing countries.

Box 7.2: ROER4D communication strategy for research

The research programme established a communications officer, who followed an explicit strategy for research concerned with ensuring the visibility of what was being done, generating knowledge, and disseminating and discussing results in a community of researchers.

Project purpose	Associated objectives
Visibility	1. To establish ROER4D as a significant OER research project using the website, social media (mainly Twitter and Facebook), SlideShare and external press among **global OER networks, organizations and programmes** to the extent that the project receives invitations for dialogue and participation from external OER network members.
	2. To establish credibility and receptivity (as research develops and findings can be communicated) through physical and online participation at key conferences in 2014–2016 [...] with **OER researchers and policy-makers** to the extent that positive feedback is received and the project receives invitations for further dialogue and participation at other events.
	3. To engage those in the educational field, including **publishers, MOOC providers and related research projects globally** though the newsletter and website, social media and face-to-face events, in order to expand the reach of the project beyond the immediate partner networks.
Knowledge generation	4. To share our research process openly with **both internal researchers in the ROER4D network and external OER researchers**, and to contribute to the field of 'open research' using the project website, SlideShare, publications, social media and webinars to the extent that other networks acknowledge and draw on the practices.
	5. To share and communicate research findings that relate to the use, adoption and impact of OER in the Global South with **both internal researchers in the ROER4D network and external OER researchers**, using the project website, OpenUCT/open repositories, SlideShare, publications, social media, webinars, blog posts and external press to discuss findings to the extent that ROER4D becomes a 'reference point' in the OER field (increase in number of papers and SlideShare downloads, increase in citations, increase in conference engagements and Twitter traffic).
Networking (internal)	6. To build links **among researchers within the ROER4D network** by sharing information via email announcements, the project website and newsletter, and social media (especially when organizing face-to-face events and online interactions) to the extent that researchers report feeling part of the ROER4D network (in end-of-event evaluation forms and social network analysis).
Research capacity development	7. To share resources with **ROER4D researchers** using email announcements, the project website and newsletter, and the OpenUCT repository to the extent that the website, newsletter and repository downloads show increased and sustained reach, requests for more information are received, and researchers share relevant new resources and web links.
	8. To support and build the research skills of **researchers in the ROER4D network** using live webinars, recorded webinars, presentations available via the project website, and workshop sessions, to the extent that self-reporting of capacity building via surveys and interviews confirms the extent of skills gained and articles published in peer-reviewed journals.

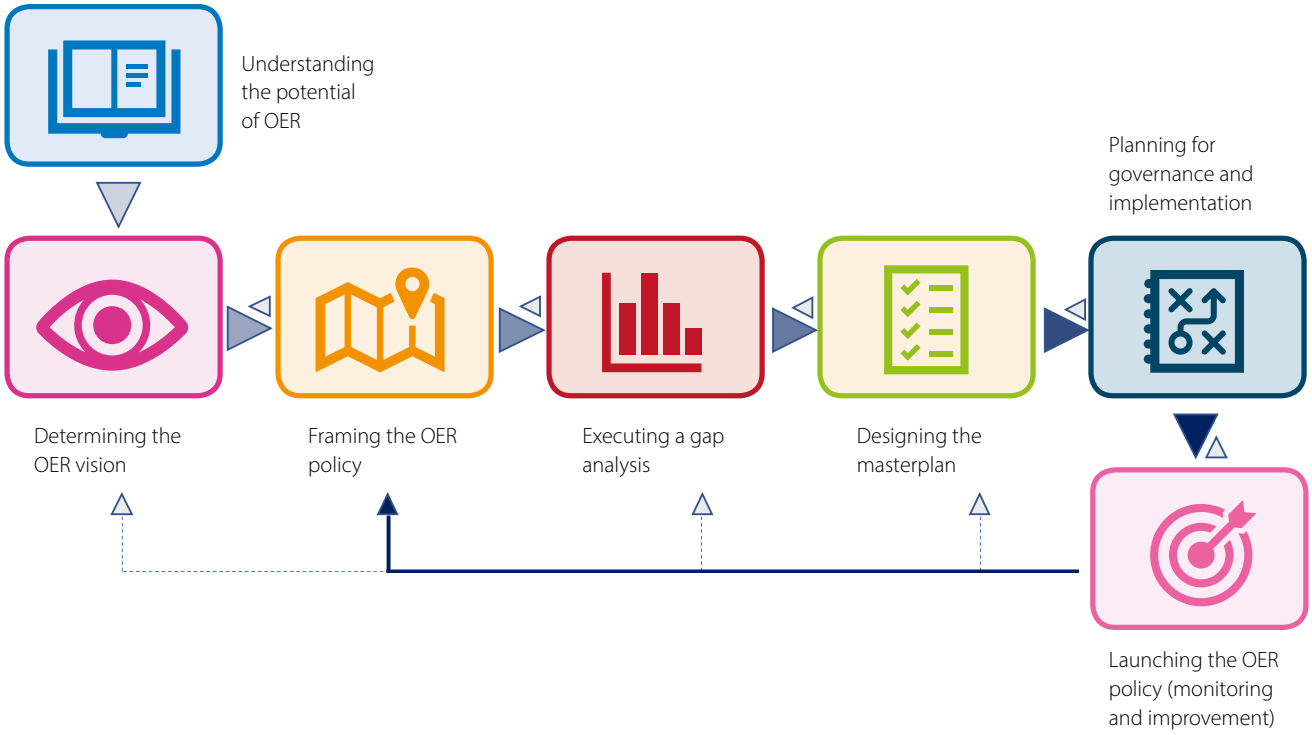
Source: Walji (2018), ROER4D project activity toolkit: Communications, p.9. Available in CC BY 4.0 at https://doi.org/10.5281/zenodo.1221329

Planning the next generation of your OER policy

The final aim of the OER policy is to enable all learners to benefit from high-quality teaching and learning. For this reason, the underlying objective for the policy-maker should be to achieve the maximum levels of scope and scale in the policy framework (see Chapter 3) – i.e., to fully mainstream the policy and its impacts.

For this reason, in the launching and practical implementation phase of the policy, discussions with users and stakeholders, regular monitoring exercises and more in-depth studies must be in place to assess the effectiveness of the policy, with a view to adjusting or replacing activities and implementation methods, including stakeholder groups, etc. to improve the reach of the OER policy. This accounts for the feedback loop going between the launching phase and the policy framework in the design of these guidelines (see Figure 14). Box 7.3 gives the example of Bahrain as having an evolving policy that expanded and changed over time.

Figure 14: Visualization of the feedback loop



Source: Authors

Box 7.3: The example of Bahrain's evolutionary approach to scope and scale

In this context, it is interesting to see the evolution of Bahrain's digital strategy, which started with a 'Schools of the Future' project in 2004 and developed into the policy for 'Digital Empowerment in Education', introduced in December 2014 and including OER as one policy element (Miao, Mishra, & McGreal, 2016). This policy of digital empowerment is part of a larger policy called the 'Kingdom of Bahrain 2030 Vision', which envisages Bahrain as a knowledge-based economy harnessing digital technologies to provide innovative and sustainable solutions for all citizens.

Phase 7: Launching the policy as event and process

This chapter has argued that launching of the policy entails the organization of central events supported through high-level endorsement, targeting different stakeholder and user groups with the purpose of clarifying and communicating the policy's goals and implementation plan. Furthermore, the policy should be launched as an open process that foresees adaptation and development throughout the policy lifecycle, based on systematically monitoring and securing an evidence base. The policy-maker's task at the end of this chapter is to provide more detail for each of these components in their own case.

You are now asked to provide details of your plan, with a short description, deadlines and notes on who will be involved in each component.

Guiding questions:

1 **What will the communication strategy look like?**
Please provide details (see the draft table in this chapter) on target group, activities, main themes, types of events and how you will reach your target audience.

2 **What are the arrangements for reviewing and streamlining the policy?**
Taking inspiration from the section above, please provide details on who will be involved in the review of the practical implementation and who will organize an analysis. Include details on how regularly this process will take place and what will be needed to ensure that the results are endorsed and implemented. Also note how independent researchers might be involved in this process.

3 **What are the arrangements for a full review with a view to expanding the scope and scale of the policy?**
Taking inspiration from the section above, please provide details on who will be involved in the review of the policy impact and who will organize an analysis. Include details on when this evaluation will take place and what will be needed to ensure that the results are endorsed and implemented. Also note how independent researchers might be involved in this process.

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Guidelines on the development of open educational resources policies

Open educational resources (OER) – and to a greater extent, OER policies – can increase the quality and accessibility of teaching and learning as well as foster knowledge creation within a country.

This publication provides detailed guidelines on how to develop systematic and effective policies on OER. Such policies are important to coordinate, strengthen and drive initiatives in a country; they involve government and institution actors on various levels working together to leverage OER toward achieving common goals under a national educational framework. OER policy provisions can be a part of a dedicated national masterplan, be under the framework of an overall education programme, or be elements incorporated into various strategies across multiple sectors.

These guidelines lay out steps to review, analyse, develop, implement and monitor a context-relevant OER policy. They guide, but do not determine, what involved actors should do in a specific set of circumstances, providing a comprehensive framework for governments and institutions to set out vision and the scope of their policy.

Each chapter introduces the purpose of the phase, provides background information and references practical examples for illustration. At the end of each chapter, specific tasks are set for the policy designer, which will help with the formulation of the final OER policy.

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