



United Nations
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COMMONWEALTH *of* LEARNING

Guidelines for Open Educational Resources (OER) in Higher Education



**Guidelines
for
Open
Educational
Resources
(OER)
in
Higher
Education**



The Commonwealth of Learning (COL) is an intergovernmental organisation created by Commonwealth Heads of Government to encourage the development and sharing of open learning and distance education knowledge, resources and technologies.

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Guidelines for Open Educational Resources (OER) in Higher Education

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Glossary of terms

Open Access Publishing: Open access publishing usually refers to the worldwide electronic distribution of peer-reviewed journal literature in order to give free and unrestricted access to it.¹

Open Educational Resources (OER): OER are teaching, learning and research materials in any medium that reside in the public domain and have been released under an open licence that permits access, use, repurposing, reuse and redistribution by others with no or limited restrictions (Atkins, Brown & Hammond, 2007).² The use of open technical standards improves access and reuse potential.

OER can include full courses/programmes, course materials, modules, student guides, teaching notes, textbooks, research articles, videos, assessment tools and instruments, interactive materials such as simulations and role plays, databases, software, apps (including mobile apps) and any other educationally useful materials.

The term 'OER' is not synonymous with online learning, eLearning or mobile learning. Many OER — while shareable in a digital format — are also printable.

Open Licence: An open licence is a standardised way to grant permission and to state restrictions to accessing, using, repurposing, reusing or redistributing creative work (whether sound, text, image, multimedia, etc.).³

For definitions of related terms please refer to *A Basic Guide to Open Educational Resources (OER)* (Butcher, 2011), published by UNESCO and COL.⁴

¹ Budapest Open Access Initiative (<http://www.soros.org/openaccess/read>)

² *A Review of the Open Educational Resources (OER) Movement: Achievements, Challenges, and New Opportunities* (<http://www.hewlett.org/uploads/files/ReviewoftheOERMovement.pdf>)

³ Creative Commons (<http://creativecommons.org/licenses/>) and Open Definition (<http://opendefinition.org/guide/>)

⁴ See *A Basic Guide to Open Educational Resources (OER)* (<http://www.col.org/oerBasicGuide>).

1

Introduction

1.1 Purpose of the Guidelines

Open educational resources (OER) are materials used to support education that may be freely accessed, reused, modified and shared. These Guidelines outline key issues and make suggestions for integrating OER into higher education. Their purpose is to encourage decision makers in governments and institutions to invest in the systematic production, adaptation and use of OER and to bring them into the mainstream of higher education in order to improve the quality of curricula and teaching and to reduce costs.

1.2 Rationale for the Guidelines

1.2.1 The higher education context

In the current knowledge-driven global economy, higher education systems play major roles in social development and national economic competitiveness. However, they face immense challenges in meeting rising enrolment demands worldwide. Forecasts suggest that current global enrolments of 165 million will grow by a further 98 million by 2025. However, this growth is unlikely to be accompanied by equivalent increases in the human and financial resources available to the higher education sector.

Many institutions are incorporating information and communication technologies (ICT) into their management, administration and educational programmes in order to serve their students more cost-effectively and to prepare them for the world into which they will graduate. In many developing countries, however, access to hardware, software and connectivity remain challenges. It is therefore critical to adapt pedagogical approaches and learning materials to this environment while ensuring high quality and relevant educational opportunities.

In parallel, ICT are dramatically increasing the transfer of information through global communication systems, leading to an explosion in the generation

and collective sharing of knowledge. The participation of non-specialists in previously specialised disciplinary areas is extending the boundaries of scholarship, while dynamic knowledge creation and social computing tools and processes are becoming more widespread and accepted. This opens up opportunities to create and share a wider array of educational resources, thereby accommodating a greater diversity of student needs. The digitisation of information, combined with its increasingly widespread dissemination, poses significant challenges to concepts of intellectual property. Copyright regimes and business models for publication are under scrutiny.

Increased online access to OER has further promoted individualised study, which, coupled with social networking and collaborative learning, has created opportunities for pedagogical innovation.

1.2.2 Open licensing and the emergence of OER

Open licences have emerged in an effort to protect authors' rights in environments where content (particularly when digitised) can easily be copied and shared without permission. Open licences seek to ensure that copying and sharing happen within a structured legal framework that is more flexible than the automatic all-rights-reserved status of copyright. They allow permissions to be given accurately, while releasing the restrictions of traditional copyright.

OER are part of this process. They allow for more flexibility in the use, reuse and adaptation of materials for local contexts and learning environments, while allowing authors to have their work acknowledged.

Some advocates of OER say that a key benefit of open content is that it is 'free', but this is simplistic. Open content can be shared with others without asking permission and without paying licence or other access fees. However, some important cost considerations must be taken into account. Taking effective advantage of OER requires institutions to invest systematically in programme/course design and materials development and acquisition. Time must be invested in developing courses and materials, finding appropriate OER, adapting existing OER and negotiating copyright licensing (if material is not openly licensed). There are also associated costs such as the procurement and maintenance of ICT infrastructure (for authoring and content-sharing purposes) and bandwidth.

Educational institutions are making these investments in order to improve the quality of teaching and learning. They enable peers to share materials and enrich the curriculum for students. Institutions using and adapting OER can find this a cost-effective way of investing in materials design and development.

1.2.3 The transformative potential of OER

The growing demand for higher education and the ongoing rollout of ICT infrastructure have created unique challenges for higher education institutions in an era of tight resources. It has become increasingly important for educational institutions to support, in a planned and systematic manner:

- Development and improvement of curricula and learning materials;
- Ongoing programme and course design;
- Organisation of interactive contact sessions with and among students;
- Development of quality teaching and learning materials;
- Design of effective assessment tools for diverse environments; and
- Links with the world of work.

OER can make a significant contribution to these processes. However, OER do not automatically lead to quality, efficiency and cost-effectiveness; much depends on the procedures put in place. The transformative educational potential of OER depends on:

1. Improving the quality of learning materials through peer review processes;
2. Reaping the benefits of contextualisation, personalisation and localisation;
3. Emphasising openness and quality improvement;
4. Building capacity for the creation and use of OER as part of the professional development of academic staff;
5. Serving the needs of particular student populations such as those with special needs;
6. Optimising the deployment of institutional staff and budgets;
7. Serving students in local languages;
8. Involving students in the selection and adaptation of OER in order to engage them more actively in the learning process; and
9. Using locally developed materials with due acknowledgement.

The transformative potential of OER also includes the benefits of sharing and collaborating among institutions and countries, and the creatively disruptive role of OER in opening up new educational models.

1.3 Scope of the Guidelines

Given the potential of OER to improve higher education systems, UNESCO and the Commonwealth of Learning (COL) have developed these Guidelines, after broad consultations with stakeholders in all regions of the world, to support governments, higher education institutions/providers, academic staff, student bodies and quality assurance/accreditation and recognition bodies. A UNESCO-COL companion document, *A Basic Guide to Open Educational Resources (OER)* (Butcher, 2011),⁵ provides more detailed information about all aspects of OER.

⁵ See <http://www.col.org/oyerBasicGuide>.

2

Guidelines for Higher Education Stakeholders

2.1 Guidelines for governments

The roles of governments in higher education and the relationships of governments with institutions in this sector vary widely from country to country. However, governments can usually play an important role in setting policies for higher education systems. They have an interest in ensuring that public investments in higher education make a useful and cost-effective contribution to socio-economic development. Most governments also support some universities financially.

In this context, governments are often in a position to require that educationally useful material developed with public funds be made available under open licences. While there may sometimes be reasons for not requiring open licensing, the sharing of educational materials has significant potential to improve the quality, transparency and accessibility of higher education systems. Likewise, governments can use open licensing regimes to increase the leverage of public investments, by facilitating widespread reuse of those resources with minimal additional investment.

In this context, it is suggested that governments:

- (a) Support the use of OER through their policy-making role in higher education.** This could include encouraging and supporting the use of OER in adapting learning experiences to a greater diversity of learners and supporting national social-inclusion agendas. In this way, it would be possible to encourage equitable access to higher education and improve learning outcomes for all learners. Sustainability of this endeavour might be encouraged by setting up a government programme of support for OER creation and reuse.
- (b) Consider adopting open licensing frameworks.** One effective way to accelerate open licensing and the sharing of higher education resources would be to adopt, within policy frameworks, an appropriate national open licensing framework. This might form part of an overarching policy

framework on intellectual property rights (IPR) and copyright in higher education that spans both research and teaching activities. Such a licensing framework could also cover the copyright and IPR status of educational materials produced by government departments and agencies.

- (c) Consider adopting open standards.** Linked to the above could be the adoption of appropriate open standards. The purpose would be to ensure full access to and use/sharing of resources in higher education. This could span both research and educational publications, serving to ensure the perpetuity of editable electronic documents, regardless of changes to software. Such standards could cover educational materials produced by government departments and agencies and by institutions receiving government support for developing educational resources.
- (d) Contribute to raising awareness of key OER issues.** This could include the development and sharing of case studies of good practice and relevant examples of use to support implementation efforts. Governments can assist higher education stakeholders to understand issues surrounding IPR, as well as how IPR are being challenged and reshaped by the rapid digitisation and online sharing of information and resources.
- (e) Promote national ICT/connectivity strategies.** Given the centrality of ICT to accessing and sharing content online, such support could focus on ensuring sustained provision of connectivity and staff/student access to ICT within higher education systems.
- (f) Support the sustainable development and sharing of quality learning materials.** Key to the sustainable development and use of OER will be supporting higher education institutions, individually and collectively, in their efforts to produce and share high quality educational resources. This could include support for national initiatives to develop local content and regional/global efforts to develop OER repositories and directories, as well as fostering mechanisms to promote quality in OER. There is no single strategy that will work for every context, but a coordinated approach would likely yield the best results.

2.2 Guidelines for higher education institutions

Higher education institutions can play a critical role in supporting their teaching staff in the creation of effective teaching and learning environments for students and providing ongoing opportunities for professional development. Identifying and developing learning resources are both integral parts of this process. Institutions should aspire both to create OER and to use OER from elsewhere.

Well-designed learning resources encourage greater individual engagement by students with information, ideas and content than is possible with lectures alone. By making such resources an integral part of the teaching and learning process, limited face-to-face teaching time with students can be more effectively used to foster engagement and to nurture discussion, creativity, practical applications and research activities.

In developing courses and learning resources, teaching staff naturally use what is available. The increasing pool of OER not only widens their choice, but also creates opportunities for new resources to be adapted to fit the local context in terms of culture and learning needs — without necessitating lengthy copyright negotiations or duplicating content development.

Experience shows that, when institutions make good quality courses and materials publicly available online, they can attract new students, expand their institutional reputation and advance their public service role. Such institutions may also further the dissemination of research results and thereby attract research funding. However, institutions have to position OER within their institutional branding and take into account any income that the sales of their educational materials may generate.

In this context, it is suggested that higher education institutions:

(a) *Develop institutional strategies for the integration of OER.* These

Guidelines suggest elements that institutions may wish to consider in developing corporate strategies for the integration of OER into a range of activities.

(b) *Provide incentives to support investment in the development, acquisition and adaptation of high quality learning materials.*

Institutional policies should be reviewed to:

- Encourage judicious selection and adaptation of existing OER, as well as development of new materials where necessary;
- Promote the publication of educational materials as OER within institutional protocols;
- Promote research on using, reusing and repurposing OER;
- Promote students publishing their work (with the guidance of academic staff and within institutional protocols) under an open licence as OER;
- Build OER into mechanisms for institutional and individual monitoring;
- Promote collaboration both within and beyond the institution in developing materials;
- Provide staff with appropriate incentives and rewards for the development, acquisition and adaptation of learning materials; and
- Ensure that staff workload models allow for curriculum, course and materials design and development.

- (c) Recognise the important role of educational resources within internal quality assurance processes.** This should include establishing and maintaining a rigorous internal process for validating the quality of educational materials prior to their publication as OER.
- (d) Consider creating flexible copyright policies.** Such policies could make it simple for staff to invoke some-rights-reserved copyright or other licensing permutations when this is deemed necessary. These policies could be part of a wider institutional process to ensure that robust, enforceable IPR, copyright and privacy policies are in place and accurately reflected in all legal contracts and conditions of employment.
- (e) Undertake institutional advocacy and capacity building.** Ongoing awareness-raising, capacity-building (staff development) and networking/sharing for both women and men can be carried out to develop the full range of competences required to facilitate more effective use of OER.⁶ These activities could aim to encourage a shared vision for open educational practices within the organisation, which would ideally be aligned to the institution's vision and mission and linked to incentives.
- (f) Ensure ICT access for staff and students.** This means striving to ensure that academic staff and students have ubiquitous access to the necessary ICT infrastructure, software and connectivity to access the Internet and develop or adapt educational materials of different kinds. This should include software applications, such as Web content editing tools, content management systems, templates and toolkits that facilitate the creation and use of adaptable, inclusively designed educational resources.⁷ It might also entail developing a repository of the work of academic staff and students that could serve as a powerful teaching and learning resource, while raising awareness of the distinction between appropriate sharing/collaboration and plagiarism. Staff and students should also have access to training/professional development and support to use these systems.
- (g) Develop institutional policies and practices to store and access OER.** This includes the capacity to store, manage and share resources and content, both internally and externally, so that academic endeavours build on a growing base of institutional knowledge. This might be done most cost-effectively as part of a coordinated national strategy or in partnership with emerging global OER networks and repositories based on open standards.
- (h) Review institutional OER practices periodically.** Such reviews will help the institution determine the value of its policies and practices. They could include reviewing the extent of the use of openly licensed educational materials in higher education programmes. They could also include assessing the effects of this use on the quality of educational delivery and

⁶ A complete list of relevant skills and competences for consideration is included in Appendix 1.

⁷ See Appendix 2.

its impact on the cost of developing/procuring high quality teaching and learning materials for undergraduate and postgraduate programmes. Where relevant, this might be extended to showcasing examples of good practice, in both marketing publications and academic research publications.

2.3 Guidelines for academic staff

Academic staff are vital agents in ensuring the quality of teaching and learning delivered to students. They are central to the teaching and learning experience of students. Teachers face a series of challenges, including:

- Time constraints in preparing curriculum and selecting, adapting and/or developing teaching and learning materials and assessment tools;
- Access to high quality, relevant teaching and learning materials;
- The need to address the often diverse needs of their learners and demonstrate gender sensitivity;
- Changing teaching and learning environments (from teacher-centred to learner-centred approaches);
- Increased student access to online materials, collaborative networks and online publishing opportunities;
- Legal requirements to broaden access;
- The need to cover a broad and growing knowledge base;
- The need to update their ICT skills regularly;
- High student expectations; and
- Ever-increasing enrolments in many jurisdictions.

Responsibility for assuring the quality of any content used in teaching and learning environments, including OER, will reside predominantly with the programme/course coordinators and individual academic staff members. Whether prescribing core readings/textbooks, suggesting further readings, choosing a video to screen or using someone else's course plan, they retain final responsibility for choosing which materials — open and/or proprietary, digital or hardcopy — to use. For this reason, much of the quality of OER will depend on which resources academic staff choose to use, how they adapt them for contextual relevance and how they integrate them into various teaching and learning activities. Effective use of OER can address many of the above challenges.

In this context, it is suggested that academic staff in higher education institutions:

- (a) *Develop skills to evaluate OER.*** A good starting point is to increase knowledge of OER through exploring existing OER in suitable portals/repositories and determining what might be useful in courses and modules. Academic staff may find existing OER to be useful benchmarks for reflecting on and improving their own curriculum and pedagogy as well as those of

others. Such exploration and peer support/review may also develop their confidence to share new and/or adapted resources to address curriculum gaps in the existing pool of OER, which would enable them to contribute to global knowledge.

- (b) Consider publishing OER.** For some academic staff, this might be initiated most comfortably by starting small, working collaboratively with peers (including peer reviews) and publishing materials openly that are already routinely produced as part of teaching and learning, including course outlines, course information booklets or hand-outs, teaching notes and course assessment tools and instruments. Over time, such practices could generate a rich, inter-institutional repository of materials on which to draw. It would also provide students with a richer understanding of the content area.
- (c) Assemble, adapt and contextualise existing OER.** Part of the effective use of OER includes developing skills to adapt and contextualise existing OER to respond to diverse learning needs of students and support a variety of learning approaches for a given learning goal. This can be achieved by making use of, and contributing to, the diverse pool of resources available in OER repositories and sharing information on issues and processes related to adaptation and localisation of resources.
- (d) Develop the habit of working in teams.** Just as modern research is usually a team effort, so the development and repurposing of materials is likely to be more successful and more satisfying for the academic staffs involved, if they adopt a team approach.
- (e) Seek institutional support for OER skills development.** In order to exploit OER effectively academic staff will need to acquire skills and competences, such as materials design, curriculum development and the location, selection and adaptation of OER through a blended strategy of skills development and professional skills support. They should receive institutional support for professional development in these areas, both as individuals and as teams.⁸
- (f) Leverage networks and communities of practice.** Academic staff can benefit tremendously from using existing online networks and communities of practice collaboratively to develop, adapt and share OER, as well as to engage in dialogue about their experiences in teaching and learning. Such communities of practice can also provide an excellent platform for publishing resources in existing repositories.
- (g) Encourage student participation.** Academic staff can be encouraged to use student feedback on OER to improve their own materials and encourage students to publish and contribute to OER. Students can be encouraged and supported in seeking and using OER for the purposes of self-directed study

⁸ A detailed list of relevant skills is contained in Appendix 1.

and, at the more advanced levels, for developing their own curriculum/ courses of study.

- (h) Promote OER through publishing about OER.** This can help to increase the body of knowledge available on a subject, particularly if it is done via open publications, journals and other relevant vehicles. This might include articles sharing experiences on the use, reuse and repurposing of OER and encouraging students to participate in OER.
- (i) Provide feedback about, and data on the use of, existing OER.** Providing feedback and data on the OER that have been created, adapted, used and/or reused, specifically relating to success in meeting learning goals and student needs, is an invaluable contribution to their effective use.
- (j) Update knowledge of IPR, copyright and privacy policies.** This would entail having access to relevant advice and expertise on these matters, as well as a general familiarity with institutional policies and contractual agreements relating to IPR and copyright. It is particularly important to be clear about rights and conditions relating to works created during the course of employment and how these might be shared with and used by others. Academic staff should understand how these policies might affect their rights.

2.4 Guidelines for student bodies

As the role of universities has evolved, so too has the role of the student. Emerging trends include a need for active global citizenship, employability, transferable skills and knowledge, communication skills, creativity and innovation. Key challenges include meeting the rising costs of education (including textbooks) and identifying appropriate educational courses/ programmes that meet learning needs. Effective OER use can contribute to resolving these challenges, both by making the content of educational programmes more transparent and lowering the cost of accessing them.

When adequately supported, students have great potential to support higher education providers in sourcing, adapting and producing OER in partnership with academic staff.

To promote these changing student roles, student bodies have to play a role in shaping the quality of their educational experience. Although creating teaching and learning environments that harness OER in educationally effective ways is primarily the responsibility of academic staff, student bodies — as key stakeholders in higher education — should be aware of the relevant issues and integrate them as appropriate into their interactions with other higher education stakeholders.

In this context, it is suggested that student bodies:

(a) Understand the issues of OER and undertake advocacy of OER.

Student bodies can actively promote awareness among students of the potential of OER to improve the educational experience, based on the understanding of educational and economic benefits of OER mapped out in these Guidelines and the UNESCO-COL document *A Basic Guide to Open Educational Resources (OER)* (Butcher 2011).⁹ Student bodies could also support and advocate the sharing of publicly funded educational materials under open licences and understand students' own roles as knowledge producers and active participants in the learning process. Student bodies can also collaborate with other countries' student bodies with similar focus on OER.¹⁰

(b) Encourage their members to publish work as OER. Students can make a significant contribution to increasing the use of OER by publishing their work (preferably under the guidance of academic staff and within institutional protocols) under an open licence. A repository of student work could serve as a powerful learning resource, while also raising awareness about the distinction between appropriate sharing/collaboration and plagiarism.

(c) Take an active role in assuring the quality of OER through social networks. Student bodies can encourage students to participate in the social networking environments that have been created around OER repositories, so that they play an active role in assuring the quality of content by adding comments on what content they are finding useful and why.

(d) Recognise that ICT are an increasingly important part of the higher education experience and are often crucial for students with special educational needs. Student bodies should engage in institutional decision-making processes to ensure that the ICT chosen are directly useful to students, are inclusive and conform to existing open standards.

(e) Encourage student participation in activities to support OER development. Student bodies can actively support and promote strategies to allow students to assist in sourcing, adapting and producing OER in partnership with academic staff. Furthermore, student bodies can help to shape the nature and quality of students' educational experiences by encouraging and supporting the use of OER for the purposes of self-directed study and, at the more advanced levels, by having students create their own curriculum/courses of study.

⁹ See <http://www.col.org/oerBasicGuide>.

¹⁰ See, for example, <http://www.studentpirgs.org/textbooks/>.

2.5 Guidelines for quality assurance/ accreditation bodies and academic recognition bodies

Quality assurance and qualifications recognition have become central elements of higher education at all levels because of its increasing diversity and the mobility of students, researchers and other professionals.

Quality assurance is primarily the responsibility of higher education institutions, although external quality assurance bodies play an essential role in fostering a quality culture through the assessment of programmes and reviews of institutional quality assurance mechanisms. When assessing the quality of teaching, quality assurance bodies normally consider the educational resources that are produced, adapted and used by the institutions (including OER). Quality assurance bodies therefore have a role in ensuring that policies are in place to support the use of OER.

Recognition bodies should also have an understanding of the role of OER in higher education to ensure the fair recognition of qualifications. The missions of quality assurance bodies and recognition bodies are closely linked, and recognition bodies often rely on information provided by quality assurance bodies. Therefore, recognition bodies are also likely to consider the educational resources produced, adapted and used by the awarding institution.

In this context, it is suggested that quality assurance bodies and recognition bodies:

- (a) *Develop their understanding of OER and how it impacts quality assurance and recognition.*** This could include ensuring that professionals involved in quality assurance and recognition are aware of the increasing importance of OER in the development and use of educational resources by higher education institutions. Particular attention might be paid to the shifting terrain of IPR and copyright, and to developing an understanding of the range of licensing options available for educational resources.
- (b) *Engage in debates on OER, in particular on copyright.*** Like all other stakeholders in higher education, quality assurance bodies and recognition bodies will need to influence policy developments around OER, focusing on both the opportunities and challenges that OER create.
- (c) *Consider the effects of OER on quality assurance and recognition.*** As OER become more common it is increasingly important to ensure that quality assurance and recognition principles and processes support the effective use of OER. In this regard, it will be important to review the role and use of OER in improving the quality of teaching and learning and develop criteria for assessing the effectiveness of the integration of OER into institutional practice.

(d) Accept OER as good practice in quality assurance and recognition.

If contributing to OER is accepted as good practice by higher education, then external quality assurance processes may redefine their scope and outreach. This would ensure a shift in focus towards embedding the creation and use of OER in the institutional culture while monitoring their integration into internal quality assurance practices.

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Appendix 1

Useful knowledge, competences and skills for effective use of OER in higher education

Below is a 'shopping list' of the knowledge, competences and skills that higher education institutions may wish to develop in order to use OER effectively. This list highlights areas where openness adds value and/or where particular attention is needed. These areas are:

1. Expertise in advocacy and promotion of OER as a vehicle for improving the quality of learning and teaching in education (having a good grasp of both conceptual and practical issues, policy implications, etc). This requires:
 - (a) Commitment to the concept of openness, without which any attempts at advocacy are unlikely to succeed;
 - (b) Understanding of the pros and cons of different open licensing arrangements, combined with insight into how most current policy environments constrain the use of OER and open licensing of intellectual capital (with a particular focus on the challenges of persuading educational decision makers in environments where intellectual property policies make no provision for open licensing);
 - (c) Clarity about the difficult issues associated with using proprietary content in diverse online environments, new media and technology and therefore awareness of the benefits of OER as open resources that are usable, reusable and adaptable with no restrictions;
 - (d) Clarity about the economic benefits of OER, in terms of marketing institutions and programmes, the cost-effectiveness of materials production, and policies, contracts and grants;
 - (e) Sound knowledge of practical examples of the use of OER to illustrate key points; and
 - (f) Up-to-date knowledge of the arguments for and against use of OER.
2. Legal expertise to be able to:
 - (a) Understand and advise people on how copyright works generally, the nature of copyright licensing and different approaches to the licensing of materials;

- (b) Review copyright policies, contracts and grant conditions currently in place at the institution, including policies establishing who owns copyrightable content developed by administrators, academic staff and others;
 - (c) Develop and adapt privacy, copyright and IPR policies that facilitate and achieve goals related to publishing OER;
 - (d) Determine requirements for copyright clearance and privacy to release materials under open licences; and
 - (e) Reflect copyright and disclaimer statements accurately in materials of different kinds and multiple media.
3. Expertise in developing and explaining business models that justify and illustrate the use and benefits of open licensing to institutions, academic staff, and other creators of educational content (including publishers).
4. Programme, course and materials design and development expertise, with a particular focus on helping academic staff harness the full potential of resource-based learning and student-centred pedagogies in their programmes and courses. An understanding of educational approaches is important (e.g., being able to differentiate among open, distance, electronic and blended learning, and their respective merits), as is an understanding of the context of education in the specific sector in which work is taking place. In addition, it requires skills in:
- (a) Conducting educational needs assessments;
 - (b) Managing curriculum development processes;
 - (c) Effectively identifying target audiences;
 - (d) Defining effective and relevant learning outcomes;
 - (e) Identifying relevant content areas for programmes, courses and modules;
 - (f) Selecting appropriate combinations of teaching and learning strategies to achieve identified learning outcomes;
 - (g) Carrying out financial planning to ensure affordability and long-term sustainability of teaching and learning strategies selected;
 - (h) Developing effective and engaging teaching and learning materials;
 - (i) Integrating meaningful student support into materials during design;
 - (j) Designing appropriate effective assessment strategies;
 - (k) Applying the most appropriate media and technologies to support learning outcomes;
 - (l) Using media and technologies to support educational delivery, interaction and student support;
 - (m) Sourcing OER, based on a knowledge of the strengths and features of the main repositories, specialised repositories and OER search engines;
 - (n) Adapting and integrating OER coherently into contextualised programme and course curricula;

- (o) Negotiating with external individuals and/or organisations to issue or re-issue resources under open licences;
 - (p) Re-versioning existing resources using optical character recognition where they do not exist in digital form;
 - (q) Understanding:
 - whether it is permissible to modify the content when customising material and, if so, to what extent it can be done and how it should be handled; and
 - if work has been adapted for a specific purpose, how this should be indicated in the customised content;
 - (r) Reinforcing the need to credit the original author/source of the content that is being accessed for use through open licensing; and
 - (s) Implementing the necessary processes for producing print-on-demand texts.
5. Technical expertise. This set of skills is tightly connected to the skills of materials design and development. Increasingly, resource-based learning and student-centred strategies are harnessing a wide range of media and are deployed in e-learning environments, facilitated by the ready availability of digitised, openly licensed educational content. This requires skills in:
 - (a) Advising institutions on the pros and cons of establishing their own repositories, as well as providing advice on other possible ways of sharing their OER;
 - (b) Creating stable, operational virtual learning environments (VLE) and content repositories;
 - (c) Supporting academic staff in developing courses within already operational or newly deployed VLE; and
 - (d) Developing computer-based multimedia materials (including video and audio materials).
 6. Expertise in managing networks/consortia of people and institutions to work cooperatively on various teaching and learning improvement projects including an ability to adapt to challenging environments (for example, power outages, physical discomfort, difficult personalities, institutional politics) and remain focused on the task at hand.
 7. Monitoring and evaluation expertise to design and conduct formative evaluation processes, as well as longer-term summative evaluation and/or impact assessment activities that determine the extent to which the use of open licensing has led to improvements in the quality of teaching and learning, greater productivity, enhanced cost-effectiveness, and so on.
 8. Expertise in curating and sharing OER effectively. This includes:
 - (a) Technical skills to develop and maintain Web platforms to host OER online, as well as to share the content and metadata with other Web platforms;

- (b) Ability to generate relevant and meaningful metadata for OER;
 - (c) Knowledge of, and skills to deploy, standardised global taxonomies for describing resources in different disciplines and domains; and
 - (d) Website design and management skills to create online environments in which content can be easily discovered and downloaded.
9. Communication and research skills to be able to share information about OER, in the form of Web updates, newsletters, brochures, case studies, research reports and so on. This includes the full spectrum of skills required for such communication activities, from researching and documenting best practices and core concepts to graphic design and layout.

Appendix 2

Promoting more effective and inclusive education by designing OER for the diverse needs of students

Students learn differently. Learning experiences that match a student's individual learning needs result in the best learning outcomes. OER should be open and accessible to students with a diversity of learning needs. Learning needs are affected by:

- Sensory, motor, cognitive, emotional and social constraints;
- Learning styles or approaches;
- Linguistic and cultural backgrounds; and
- Technical, financial and environmental constraints.

Accessible learning is achieved by matching the individual learning needs of each student with a learning experience that addresses those needs. This can be accomplished through the resource delivery system by reconfiguring the resource, where possible, augmenting the resource or replacing the resource or parts of it with another resource that addresses the same learning goals.

To support this, learning materials or educational resources should:

1. Include labelling to indicate what learning needs the resource addresses;
2. Allow the creation of variations and enhancements through open licences;
3. Support flexible styling (e.g., enlarging the font, enhancing the colour contrast and adjusting the layout for students with vision impairments or mobile devices);
4. Support keyboard control of functions and navigation (for students who cannot use or do not have access to a mouse or pointing device);
5. Provide audio or text descriptions of non-text information presented in videos, graphics or images (for students who have visual constraints or who have limited displays);
6. Provide text captions of information presented in audio format (for students who have hearing constraints or lack audio interfaces);
7. Cleanly separate text that can be read in the interface from underlying code or scripting (to enable translation);

8. Use open formats wherever possible to make it easier for alternative access systems and devices to display and control the resource; and
9. Adhere to international standards of interoperability so that OER can be used on a wide variety of devices and applications.

The resource delivery system should also enable each student, or her/his support team, to identify the student's functional learning needs.¹¹

¹¹ For more information on these issues, visit the Floe project (<http://floeproject.org/>).

Open educational resources (OER) are materials used to support education that may be freely accessed, reused, modified, and shared. These Guidelines outline key issues and make suggestions for integrating OER into higher education. Their purpose is to encourage decision makers in governments and institutions to invest in the systematic production, adaptation and use of OER and to bring them into the mainstream of higher education in order to improve the quality of curricula and teaching and to reduce costs.