



Open Educational Resources

ACCESS TO HIGH-QUALITY EDUCATION FOR ALL

by Judith Evertse, October 2011

OPEN EDUCATIONAL RESOURCES (OER) ARE LEARNING MATERIALS THAT ARE FREELY AVAILABLE ONLINE FOR USE OR REUSE. SUBJECT TO CERTAIN CONDITIONS, THEY CAN ALSO BE REVISED, REMIXED, OR REDISTRIBUTED. THIS ARTICLE - THE FIRST IN A SERIES ABOUT OPEN EDUCATIONAL RESOURCES - DEALS WITH WHAT THEY ACTUALLY ARE, WHAT THE BENEFITS ARE, AND WHAT POINTS NEED TO BE CONSIDERED.

Summary

Open Educational Resources (OER) can play an important role in the transformation to an education system in which innovation, customisation, high quality, cost-cutting, and efficiency go hand in hand. Open Educational Resources (OER) are resources – separate learning materials or complete courses – that are made available online for use or reuse. Subject to certain conditions, they can also be revised, remixed, or redistributed.

Instructors can take OER materials created by others and reuse them, perhaps also adapting them so that they fit in with their own particular educational context and the individual levels and learning styles of their students. This approach can not only make the educational programme more flexible but also more efficient and less expensive. Some educational resources can also give a boost to the quality of the education provided, for example because their increased visibility means that institutions pay more attention to the content and presentation of their courses and educational resources, and receive more feedback from

users. Making their resources openly available also allows higher education institutions to provide an extensive, detailed picture of their programmes, thus helping recruit undergraduates and PhD students.

OER therefore offer clear benefits for institutions, although there are also various aspects that need to be borne in mind when deciding whether to make use of them. It may still be rather complicated, for example, for potential users to find their way around the wide but fragmented range of OER that are available. The quality of all that material is also unclear; what is missing is an overall system of quality control. OER mean that publishers and institutions will need to reconsider their income models. There is also the question of copyright that is inextricably bound up with OER: producers of these resources will need to decide the conditions for making their material openly available, while users/reusers will need to allow for the materials that they utilise being subject to various different types of conditions for use (laid down in licences).



Shift towards a knowledge-driven economy

The 2007 Treaty of Lisbon defines the aim of making Europe the most competitive knowledge-driven economy in the world. President Obama has set himself the task of making Americans the world's best trained and best equipped workforce by 2020. To make that possible, more people will need to graduate from higher education. "The only way of achieving that is through a transformation that opens up higher education to more people," says Hal Plotkin, senior policy adviser at the US Department of Education (in *Open Boek*, published in 2010 by the Dutch Open University). In the Netherlands, the aims and developments are in line with those for the United States and for Europe, which means that this country too will need see a major increase in the number of graduates. That increase does in fact look set to take place: figures published by Statistics Netherlands (CBS) in 2010 show that the Netherlands will see 25% growth in the universities of applied sciences sector and no less than 40% in the research university sector.

Obviously enough, the funds available for higher education are currently insufficient to cope with that growth. Educational institutions are therefore facing the challenge of serving an ever-larger target group despite limited funds, while also needing to distinguish themselves from fellow institutions both at home and abroad.

Sharing knowledge and education

Making knowledge accessible and sharing it can play a key role in all this. This firstly involves research material, but sharing educational resources also contributes to greater accessibility, innovation, and growth in higher education. This is already taking place in various locations in a number of countries through the provision of open educational resources that are made freely accessible online via websites and other public repositories. These Open Educational Resources (OER) can catalyse the transformation to an education system in which innovation, customisation, high quality, cost-cutting, and efficiency go hand in hand. OER are also in line with the philosophy that educational resources – and any other kind of knowledge – financed with public funds should be publicly available.

Open Educational Resources at MIT

The Massachusetts Institute of Technology (MIT) is an undisputed pioneer in the production and publication of OER. Since 2000, MIT has made Bachelor's and Master's degree courses available for a broad target group via its website. In July 2011, 2074 courses were available there. MIT OpenCourseware (OCW) has about a million visitors each month from all over the world (source: *MIT Open Courseware's Monthly Report*, available at <http://ocw.mit.edu/about/site-statistics/monthly-reports>).

But just why did MIT decide to make its courses openly available to such a broad public? In the first place, there is a favourable climate at MIT for implementing such an initiative and making it a success: both faculty and academic leaders subscribe to the belief "that openly publishing the teaching materials used at the Institute will bring people of all backgrounds together and promote mutual understanding" (source: *UNESCO report on Open Educational Resources: Conversations in Cyberspace*, 2009). It also quickly became apparent that MIT has in fact done well out of publishing Open Courses, gaining a lot of positive attention and publicity by making educational resources publicly available. This was made clear by a study which showed that 31% of new MIT students said they were aware of the Institute's OCW project, with no fewer than 35% saying that the project had significantly contributed to their decision to study there.

OER avant la lettre

The general phenomenon of Open Educational Resources in fact began long before the project at MIT, namely with the pioneering Gutenberg project. This was set up in the early 1970s by a student who came up with the idea of storing textbooks from the university library on a computer so that they could then be distributed.

Nowadays, we consider the materials available within the Gutenberg project to be Open Educational Resources, although they were not actually referred to as such at the time. It was only with the advent of open source software that it became necessary to think up a name for openly available material that was not actually software. In 1998, David Wiley – one of the pioneers of OER – introduced the term "Open Content". Four years later, at a UNESCO meeting, the term "Open Educational Resources" was proposed, which relates specifically to openly available educational materials.

Digital openness family

Open Educational Resources and Open Content are therefore members of a "digital openness family". When cultural and scientific materials are publicly available under a free licence, one refers to "Open Access" and "Open Content". The difference between them is that in the case of Open Access copying the material concerned is permitted but not adaptation. In the case of Open Content, it is specifically the intention that the material be adapted and perhaps distributed further. Open Educational Resources form part of Open Content, with the "content" specifically involving openly available educational materials. There are various definitions of "Open Educational Resources", depending on the extent to which the material can be adapted without the consent of the original author.



Another difference is that the material can be utilised commercially, which actually depends on the type of licence under which it was published. The most broadly accepted definition worldwide in 2011 – taking account of the differences where licences are concerned – is the following:

Open Educational Resources (OER) are digitized educational resources that are freely available for use by educators and learners, without an accompanying need to pay royalties or licence fees. The digitized resources may be shared via the Internet or using media such as disk-drives. OER are usually, but not exclusively, licensed using Creative Commons licences. Both the original owners of the material and the subsequent users need to clearly understand the terms of these contracts to appreciate the ways in which materials may be remixed and shared.

(source: *Background and action paper on OER*, Paul West and Lorraine Victor, 2011)

A briefer definition is:

Open Educational Resources (OER) are learning materials that are freely available online for use or reuse. OER often have a Creative Commons license that states specifically how the materials may be reused, revised, remixed, or redistributed.

Different types of accessibility

These definitions make clear that “open” means more than simply “free of charge”, and should not in fact be confused with this. The focus is in fact on the online accessibility of the material concerned. This involves primarily materials that are made available to the public in general, and not just within a closed learning environment. This implies various different types of accessibility, depending on the functions or activities for which the materials can be utilised. Those functions can be summarised under David Wiley’s “Four Rs”:

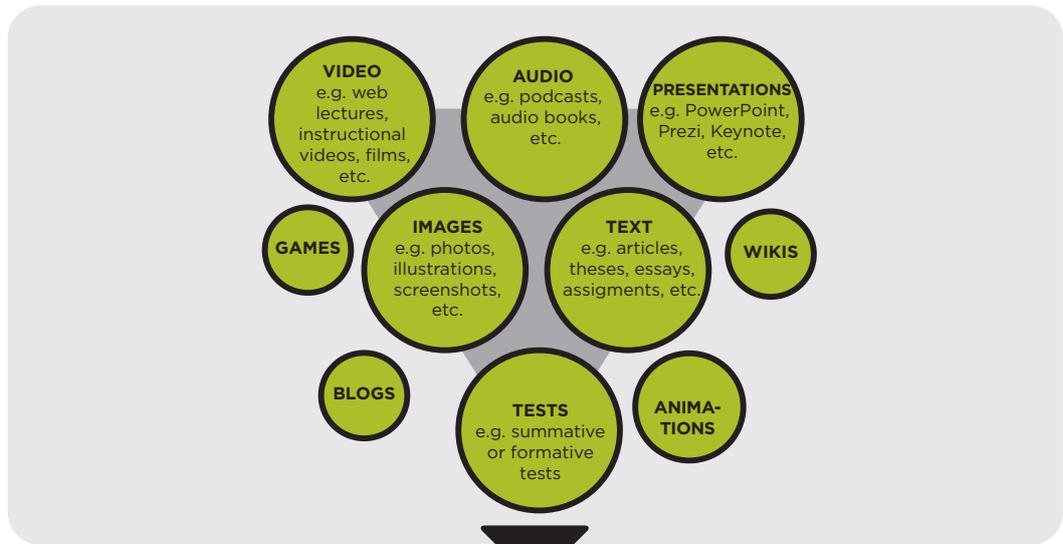
- **Reuse:** The right to reuse the content in its unaltered, literal form (e.g., make a backup copy of the content).
- **Revise:** The right to adapt, adjust, modify, or alter the content itself (e.g., translate the content into another language).
- **Remix:** The right to combine the original or revised content with other content so as to create something new (e.g., incorporate the content into a mashup).
- **Redistribute:** The right to share copies of the original content, the revisions, or the remixes with other people (e.g., give a copy of the content to a friend).

The materials in the context of OER

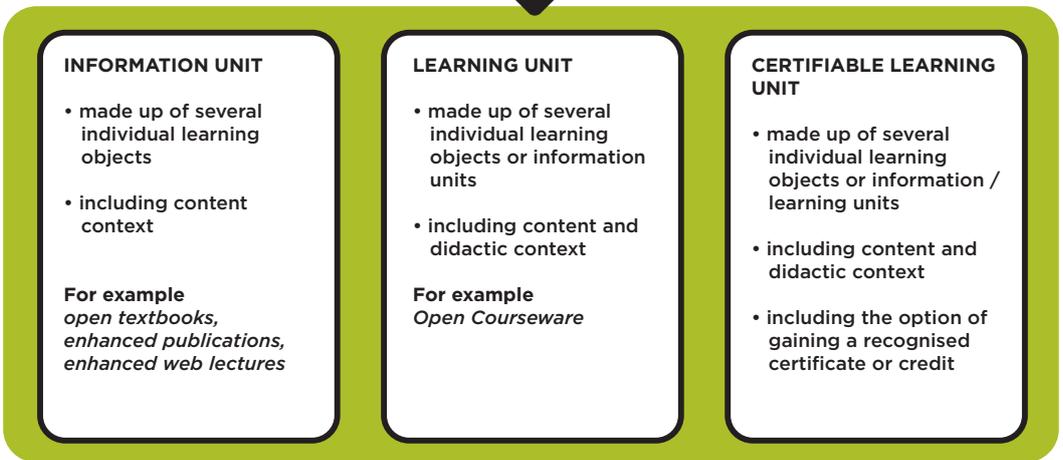
There are no restrictions on the type of educational resources concerned. Open Educational Resources can consist of individual materials – for example articles, presentations, podcasts, or web lectures – but also combined educational materials such as courses provided online. One then speaks of “Open Courseware” (OCW). Some open courses even involve the provision of assistance by instructors or collaboration with other students via interactive elements that are built into the course.



INDIVIDUAL OPEN LEARNING OBJECTS:
THE BUILDING BLOCKS



ASSEMBLED OPEN EDUCATIONAL
RESOURCES



Who are OER intended for?

The broad accessibility offered by the Internet allows a large but very heterogeneous group to become familiar with various different OER.

The consumers concerned are specifically instructors and students. Instructors can use/reuse the materials in their own teaching, while students can utilise them to prepare for exams, to catch up with lectures they have missed, or to brush up on a particular subject. The students may be formally registered with an educational institution and make use of that institution's OER or those of third parties for study purposes. There is also a large group of self-learners who are not formally registered with an educational institute but who are interested in OER, and use OER to promote their own knowledge and development.

The producers of Open Educational Resources are primarily instructors who put together various types of materials – for example readers, articles, and presentations – for various educational purposes. Instructors can develop courses or individual materials from scratch, but the availability of OER also means that they can reuse large quantities of materi-

als produced by others, perhaps adapting, combining, and distributing those materials in such a way that they fit in with their own educational context. This process is sometimes referred to as “arranging”. It is often forgotten that students also produce OER, for example by uploading their reports, dissertations, summaries, or presentations and making them accessible under an open licence.

Educational institutions, but also the authorities, also play a special role as regards OER – involving coordination and facilitation – by developing a vision and policy on OER and making the right infrastructures available for creating OER and providing access.

Advantages and points to consider regarding Open Educational Resources

Making study materials openly available can be highly beneficial to the relevant target groups and the educational institutions with which they are associated, but there are also various points that need to be considered when planning to utilise OER in an educational context. We will give a brief explanation of the various advantages and points that need to be considered.



Benefits

More efficient teaching/learning

The advent of the Internet has made it quicker and easier to share educational resources than ever before, bringing about an enormous potential increase in their audience. The Internet makes sharing possible in the widest sense of the word: institutions can make their own materials available but they can also utilise materials produced by other institutions in both the Netherlands and elsewhere. Adapting that existing material to the institution's own education context generally takes less time than would be needed to develop a course or module consisting solely of self-produced material. This can prevent reduplication of effort, i.e. instructors and institutions going to a great deal of trouble to construct a course from scratch even though a course of similar or even better quality has already been created by a different institution (source: *Background and action paper on OER*, Paul West and Lorraine Victor, 2011). One side-effect of the time saved is that the instructor is able to concentrate more on the teaching and guidance process itself rather than on the materials intended to support that process.

There is also a quantifiable physical cost saving due to lower development costs: after all, no expensive materials or methods need to be purchased, making institutions less dependent on commercial publishers.

Boosting quality by sharing

The higher profile created by sharing material makes developing high-quality learning materials more important for both the institution and instructors. The fact that those materials can be seen by anybody will start to make instructors, students, and other producers of OER extra critical as regards the content and presentation of the courses and learning materials that they make available.

The accessibility of the material also leads to feedback from a far larger group than in the past, thus offering valuable opportunities for further improving it and adapting it to the intended target groups. The basic principle is "what you give away comes back improved". Reusing high-quality materials produced by other institutions can further improve the quality of the education offered.

OER as a driving force for innovation

OER can stimulate educational innovation. Making use of educational materials produced by other institutions can reduce the cost, time, and effort involved in producing such materials, creating greater scope for developing educational innovations. Those innovations can then quickly gain momentum together with the OER because open sharing of knowledge and experience promotes the further development and dissemination of innovations.

Raising the profile

The fact that OER reach a wide public gives instructors an excellent opportunity for raising their profile, both nationally and internationally. Moreover, making materials available publicly allows the higher education institutions as such to generate positive publicity, raising the level of appreciation for the education they provide. In the past, it was mainly the publication of research results that counted towards the reputation and profile of an institution; now, however, the institution's educational resources can be showcased, enabling it to show more people than ever what it can achieve. In this way, the institution can recruit talented undergraduates and PhD students and enter into partnerships with other institutions throughout the world. Publication of OER also can be beneficial for prospective students because it gives them a far more detailed and realistic idea of the various programmes available than does the information traditionally provided about degree programmes. It can greatly benefit an institution's reputation because "when you give away material, you are seen as an authority on the subject" (Paul Rullmann, member of the executive board at Delft University of Technology in *Open Boek*).

Lifelong flexible learning

Worldwide, OER enable large numbers of people to participate in higher education and engage in lifelong learning who would otherwise be unable to enter a traditional programme. OER gives students and self-learners access anytime and anywhere to high-quality learning materials which they can use to acquire knowledge and skills for their studies, hobbies, or work. Access to a wide range of available OER means that the programme can be tailored to the individual's learning style, aims, and level, thus providing a flexible education.

Points requiring attention

Traceability

The range of freely available OER is increasing rapidly worldwide, offering users an enormous wealth of material and knowledge. But how do you find the right courses in that wide-ranging but often unorganised material? Karl Dittrich, chairman of the Dutch-Flemish Accreditation Organisation (NVAO), has this to say in *Open Boek*: "It's not everybody who is capable of browsing round independently in a mountain of information. Students still need structure." Besides the actual development of OER, producers also need to devote attention to making their materials traceable, for example by offering effective search functions, combining various sources of OER, and if possible making them available at a central location (source: *Background and Action Paper*, 2011).



Reuse of OER

Another important point is the reuse of OER. If the licence that the authors have assigned to the material permits adaptation or remixing, then the material should be offered in a form that makes that possible, preferably in accordance with open standards. At present, that is by no means always the case.

Quality and reliability of OER

The large range of OER available makes it problematical for users to determine not just their relevance but also their quality. As yet, there is no overall system of quality control for OER similar to that applying to the publication of research articles. Without such an instrument of quality control, users may be unsure as regards the quality of OER, which can act as a barrier to utilising them. Potential systems for quality control include quality assessment by users, quantitative assessment on the basis of the number of downloads and visits to the relevant website, or the creation of panels to assign seals of approval.

Copyright

OER need to be made formally “open” if they are to be genuinely “freely accessible”, but the rights of the original author must not be lost sight of. OER are often made subject to a Creative Commons licence. Such works can be used/reused or adapted – depending on the particular licence – without the author or creator needing to be notified. Before institutions, instructors, or students begin developing and sharing OER, they therefore need to be aware that they can decide for themselves on the conditions applying to the release of their material. Users/reusers will need to realise that the materials they utilise may be subject to various different licences – not necessarily Creative Commons licences – and that they will first need to determine whether material released under a number of different licences can automatically be combined or adapted, for example to create a course. For many in the education sector, lack of familiarity with this issue can be a barrier to producing, sharing, and/or utilising OER. It is therefore necessary to clearly inform the potential target group – instructors, students, and others involved within educational institutions – about copyright and OER, and about the various licences that may apply.

Income models

When considering the topic of OER, one cannot ignore the issue of funding. The advent of OER means that both educational institutions and the traditional suppliers of educational materials – the commercial publishers – will need to reconsider their income models. Developing OER and making them available can cost an institution a great deal of time and money and if it is to continue to do so, it will ultimately want to see some kind of return. The example of MIT shows

that the investment involved in making courses openly available has in fact generated extra income in the form of an increase in student admissions. However, there are potentially other ways to help institutions finance the development of OER, for example grants from government or other large organisations, sponsoring or donations, or collaboration on OER with other educational institutions.

Publishers generate income by collecting and structuring knowledge and combining it into a book or journal. According to René Montenerie, secretary to the Educational Publishers Group (GEU) in *Open Boek*, it is precisely the advent of OER and the associated wide range of available information that has made that particular function of publishers more valuable than in the past. Publishers can become “dealers in information”, so to speak.

Interaction

Various experts agree that merely making educational resources available is not enough; guidance and context are also indispensable within a high-quality education system, in the form of interaction between students and instructors. As Wim Liebrand explains in *Open Boek*: “I believe that effective interaction is necessary if you want to improve the way people learn. In the really good examples of OER, a particular component has been added, namely the idea of community. Take the Open High School of Utah: it doesn’t just make material available online, it also makes it possible to study or adapt that material with the aid of a tutor if necessary.”

Dutch examples of OER

The phenomenon of OER is becoming increasingly familiar in the Netherlands, and Dutch institutions of higher education have now started sharing and reusing OER, with the pioneers being the Dutch Open University and Delft University of Technology. The Ministry of Education, Culture and Science also appreciates the benefits that OER can have for the Dutch education system. It is therefore subsidising and facilitating the “Wikiwijs” project, which involves providing access to digital learning materials for all educational sectors from a single site.



This article is one in a series about Open Educational Resources published in the framework of the OER programme that commenced within SURF in April 2011. The aims of the OER programme are to increase awareness of OER within the Dutch higher education sector; to help higher education institutions develop a strategy for OER; and to encourage the development and use/reuse of OER in higher education.
>> www.surffoundation.nl/openeducationalresources

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