

Open Educational Resources Open content for higher education 24 October - 2 December 2005

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Forum Report

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Background and objective of the forum

Forum organization

An introduction to Open Educational Resources and open course content: the importance and benefits of OER

Challenges for OER providers

Faculty members and OER

Intellectual property and copyright issues

Challenges for users of OER

Seeking global balance in OER

Promoting the OER movement

Next steps

Background and objective of the forum

Open Educational Resources and open course content - a model for sharing

Higher education institutions worldwide face significant challenges related to providing increased access, while containing or reducing costs. Meeting increasing and increasingly varied demand for quality higher education is an important consideration in the policy debate and institutional development in many countries. And it is particularly important in the case of developing countries, for whom demand often greatly exceeds capacity in the existing higher education system.

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New developments in higher education – from virtual universities and e-learning to open source initiatives – speak to the efforts on the part of the traditional higher education community, as well as new providers, to address this increasing demand. The open source movement can be seen as reflecting the philosophy of academe, which is based upon a collegial sharing of information and new discoveries through the peer-reviewed academic publication process to share knowledge. “Perhaps the cultural disposition for open review and exchange among peers might support the current open-source courseware and knowledgeware movement in higher education and might encourage a greater volume of work in an open-source environment...” (Anne Moore in Educause Review, September/October 2002.)

Open initiatives in higher education have crystallized around three major areas of activity: the creation of open source software and development tools, the creation and provision of open course content, and the development of standards and licensing tools. The outputs of all three may be grouped together under the term Open Educational Resources (OER). This term has been adopted by UNESCO to refer to the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes.

UNESCO - a platform for dialogue

UNESCO provides an international forum for discussion and debate on issues of concern to Member States. It has five main functions – as a laboratory of ideas, a clearinghouse, a standard setter, a capacity builder in Member States and a catalyst for international co-operation. This makes the organization an appropriate host for an international discussion of open course content.

An international forum - exploring the issues

Open course content, whether full course materials or course elements, constitutes an important resource to higher education institutions, teaching staff and learners. However, if there is little or no awareness of availability, open course content cannot be exploited, and even with awareness of availability, there are challenges and barriers to its effective use.

With support from the William and Flora Hewlett Foundation, the UNESCO IIEP is implementing a strategy to increase awareness at the international level, and to support capacity building and informed decision making on the part of current and potential users and providers of openly available course content. The first step was to hold an international forum to discuss OER, to hear from some of the providers and some of the users, and to reflect on provision and use through the exploration of several specific issues.

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Forum organization

Lasting six weeks, from 24 October to 2 December 2005, the forum was organized to present some initial background information about Open Educational Resources and then to examine a number of examples of providers and users of OER, along with several key related issues. Some 480 individuals from 90 countries participated, either by exchanging email or by receiving a daily digest of the messages. A wide range of expert discussants presented institutional examples and issues and leant their experience and intelligence to the discussion. With the “whole world around the table” (as one participant put it), email exchanges averaged 100 each week for a total of more than 700 postings.

The sessions were organized to provide a substantial amount of information and to focus the discussion, always a challenge in Internet forums.

Session 1 - Open Educational Resources and open course content: an introduction

An initial general reflection on Open Educational Resources was facilitated by Sally Johnstone, Executive Director of the Western Cooperative for Educational Telecommunications.

Session 2 - Perspectives of the providers and issues related to provision

The first week of the session gave participants an overview of four institutional initiatives. Each represents a different approach to OER provision, and each was presented by the project director:

Anne Margulies, Executive Director of Massachusetts Institute of Technology
OpenCourseWare
Richard Baraniuk, Director of Connexions at Rice University
Candace Thille, Project Director of Carnegie Mellon's Open Learning Initiative
David Wiley, Director of the Open Sustainable Learning Opportunity Research
Group at Utah State University

In Week Two of the session, participants explored in more depth two key issues associated with provision of OER in an institutional setting:

Reflection on the experience of faculty members or academics was led by Steve Lerman, Director of the MIT Center for Educational Computing Initiatives, Chair of the MIT Faculty when the OpenCourseWare initiative was announced, and today Chair of the OCW Faculty Advisory Committee.

Lawrence Lessig, Founder and Chair of the Board of Directors of Creative Commons and Professor, Stanford Law School, provided expert input to a discussion on copyright and intellectual property issues.

Session 3 - Perspectives of the users and issues related to use

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During Week One of the session, participants heard from representatives from four organizations that are adapting and using OER in new contexts: two in Africa, one in Spanish-speaking countries and one in China:

Mohamed-Nabil Sabry, Director of the University Centre for Research, Development and International Cooperation at the Université Française d’Egypte
Peter Bateman, Manager of Instructional Technology and Design for the African Virtual University

Pedro Aranzadi, Director of Projects for the Hispanic higher education consortium Universia

Derrick Tate, Assistant to the Chairman of China Open Resources for Education

In the second week of the session, the discussion turned to a consideration of the implications of using existing OER. Two discussants commented on two specific concerns:

Learning Object Repositories were presented by Gerry Hanley, Executive Director of MERLOT, as an example of one system to help users find and retrieve OER.

Mamdou Ndoye, Executive Secretary of the Association for the Development of Education in Africa commented on cultural and linguistic concerns associated with the use of OER from other institutions.

Session 4 - Issues for further discussion

During the final week, Susan D’Antoni, head of IIEP’s Virtual Institute and the general moderator of the forum, invited participants to reflect on the previous sessions, and to put forward their perceptions of the most important issues for subsequent discussion.

An introduction to Open Educational Resources and open course content: the importance and benefits of OER

The OER movement is breaking down barriers that have blocked access to academic content. Until recently, most electronic course content was locked up behind passwords within proprietary systems, noted the forum’s initial moderator, Sally Johnstone. (See Sally’s Background Note to the first session.) OER represents a major step toward sharing teaching materials, methods and tools, just as academics have shared their work in scholarly papers for a long time. The result is to augment teaching resources while expanding knowledge opportunities for learners and faculty members.

Throughout the forum, a forthright exchange of views stimulated thought and ideas that can advance the cause of OER. Participants stressed the importance of providing open, accessible and superior higher education content for a global community of teachers and scholars, students and lifelong learners. Whether OERs are categorized as ‘open access’ or

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'free content', they collectively promote autonomy and self-reliance within the learning community. Without the constraints of time or geography, the power of education is released to combat economic, social and cultural obstacles. Through independent, self-determined learning and open academic content, the individual is able to grow intellectually beyond previous personal, institutional or local boundaries. Other benefits range from developing valuable work skills to engaging in life-enriching, lifelong learning.

Distinct – but not incompatible – visions of the function and purpose of OER were apparent early in the forum discussions. These visions ranged along a spectrum from OER as disparate educational materials, to scholarly sharing among academics, to publication of complete courses, to distance education leading to a qualification. OER advocates agreed they were all on the same path but acknowledged they were positioned at various points along a developing continuum.

David Wiley proposed a useful way to reflect on OER: “We must view the vast body of open educational resources as ‘content infrastructure’... [I]nstead of thinking about Open Educational Resources as being the educational opportunity we are trying to share with people (the end of our work), we should think about them as the basic resources necessary for doing our job (a means to the end of our work). A vast collection of Open Educational Resources is, of course, the first milestone in our work, not the end of our work.”

What is required for the future is vision and enterprise by those who both produce and consume Open Educational Resources tied closely to their collective motivation to enlist governments, educational institutions and organizations into supportive, collaborative arrangements.

Challenges for OER providers

A primary purpose of the OER movement, which can be seen as developing out of the open source paradigm, has been to make educational materials widely available to a broad-based population of learners and teachers. A major session of the IIEP forum described, discussed and reflected on the escalating growth of the movement and identified some key issues relevant to the future development and increased use of OER.

OER initiatives were presented by Anne Margulies (MIT OpenCourseWare), Richard Baraniuk (Rice University Connexions), Candace Thille (Carnegie Mellon Open Learning Initiative) and David Wiley (Center for Open and Sustainable Learning, Utah State University).

The institutions illustrated several different approaches to OER development. MIT OpenCourseWare – the publication on the Web of course materials used in MIT classroom teaching – is perhaps the best-publicized and most copied institutional OER model. MIT

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OCW aims to provide a snapshot of how a particular course is taught at a particular time. Although students and independent learners can and do use MIT OCW, a major goal of the project is to make MIT's teaching material available to other educators, so that they can draw on the materials for their own teaching, use them as a curriculum and course planning tool, or as inspiration for their own open content initiatives.

Utah State University is one of the institutions to have adopted the MIT course publication model, although OCW is just one component of the University's OER activities. The Center for Open and Sustainable Learning has developed a social software tool – Open Learning Support – to support learner communities using OCW, and also an OCW development tool – eduCommons.

The other two institutions have developed very different models. Rice University's Connexions project attempts to bring the three strands of content, communities and software together in one intuitive and dynamic teaching and learning environment. Unlike the MIT model, Connexions is not a static institutional publishing initiative; anybody, anywhere in the world, is free to contribute course materials, and the modular content structure is designed to promote re-mixing and re-use in different contexts.

Carnegie Mellon's Open Learning Initiative is different again. Carnegie Mellon set out to develop online learning environments with rich media support. The resulting courses are highly interactive and stand on their own, without need for classroom teaching, practical lab work in the case of science subjects, instructor mediation or external evaluation. The OLI is more explicitly learner oriented than the other models; indeed the project can be seen as a testing ground for exploring how best to use available technologies to improve learning outcomes.

Each of these initiatives was described in a Background Note (including key issues, challenges, and rationales). During the ensuing discussion, forum participants added commentary and described other OER developments of which they were aware.

It was clear through the dialogue that a number of challenges confront those who develop and make available education resources for sharing. There are challenges that are specific:

- finding suitable technologies to convey OER in a feasible, useable, effective and economically viable way;
- devising a compatible infrastructure so that there is ready transferability between the provider and the user;
- collaborating to develop models and new approaches that are educationally relevant and in appropriate context for the user;
- fashioning OER that can be scaled up or down to adequately meet education requirements.

Some of the challenges are more fundamental:

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- exploring how learning takes place within the framework of OER;
- determining how best to use OER so that learning outcomes are improved;
- establishing communities of support to assist self-directed learners and to maximise the effectiveness of OER;
- exploring how much content is needed for an educator at another institution to replicate at least some part of a course published as an OER;
- evaluating the quality of present and future open course offerings;
- sustaining the economic viability of OER in the long term so that they remain freely available in an open marketplace.

One keen observation was that, “There seems to be a tension between the desire to provide rich digital learning materials – which usually demand more complex technologies – and the desire to make learning materials as widely available as possible – which often demands much simpler technologies.”

Resolving or at least moderating this tension is a test for the academics and institutions engaged in developing and disseminating OER. One provider advocated dealing with the challenge this way: “You can’t create educational materials that function effectively in every single context any more than you can write software that runs on every single platform... [W]e should focus on solving specific instruction problems, and make sure that our solution at least works for someone. Then other developers can ‘port’ our materials to their ‘platform’, or in other words, other instructional designers can adapt our materials to solve local instructional problems.”

An alternative view was that OER should be created and tested locally before advancing to the global stage. With this approach, OER would develop in a local or community context first before becoming a global resource. The comparison used was that, “The education resource community is akin to any marketplace – there tends to be a domestic marketplace first and if the product is good then that quickly extends beyond borders.”

While it was clear from the discussions that OER is perceived as having great potential value for individuals, the benefits to institutions and faculty members were less apparent and less understandable. The main challenge to widening access to OER lies in overcoming reticence and uncertainty within the academic community. Although participants reported a growing awareness of OER, many emphasized the need to explain and promote the institutional benefits, and to provide incentives for faculty members to become actively involved.

Benefits and barriers within the institution

A major test for providers is to gain (and sustain) support for the development of OER within their own institutions. All four presenters stressed that for an OER initiative to succeed in the long term it must have support from both the academic staff and the administration. Even more importantly, OER must be perceived to be of value within the institution itself. Although MIT OCW was principally intended for an external audience, a

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high proportion of site traffic comes from within MIT itself. Students, for example, use OCW to preview and review courses, and prepare for exams. At Carnegie Mellon, students go one step further and take OLI courses for credit. The feedback they provide informs the further development of the online environment and even informs classroom instruction; the system tracks how the students learn and highlights areas where instructors should target their efforts.

The forum was reminded that the four provider cases discussed are all exceptional in the support that they have received from their university communities. A number of institutions may have committed to the development of OER, but other participants described situations where institutional support and encouragement have been less forthcoming. Cost-conscious, risk-averse institutions are not eager to make course materials available without reimbursement or controls. The economic reality may be that they cannot afford to invest significant amounts of time and money in giving away their resources for free. In addition, if content is free it risks having an image of low quality, a perception (however erroneous) that does not engender support within institutions or the academic community.

The impact of the growing commercialization of higher education as opposed to the openness of OER generated considerable debate. There appears to be a growing tension between the 'ethical push' to promote open access to knowledge and the need for university managers to "maximize income from their key assets." How can OER fit into this increasingly commercial, financially and intellectually competitive framework for higher education?

Cost reduction was identified as an ongoing challenge for institutions involved in OER development. For the MIT-type course publication model, solving intellectual property and copyright issues has proved to be one of the most costly stages of the process, in terms of both time and resources. Moreover, the per-course cost rises with the development of more cognitively informed and interactive materials. Developing web-based lessons that are as good as or better than the traditional face-to-face variety requires substantial resources. Costs include the time of the team that designs, tests and iteratively improves the courses, as well as development costs for effective simulation and feedback systems. The key to cost-effectiveness might reside in improving the scalability and transferability of the development process. None of these initiatives would have been possible without substantial contributions from external funding sources, such as the William and Flora Hewlett Foundation, but long-term economic sustainability models need to be explored.

User support and experience

There is a paucity of data and research on the user experience with OER. Forum participants emphasized the need to implement systematic data collection mechanisms to track user expectations against experience. It would be helpful to have information on:

which user support systems are in place and what is their level of effectiveness;

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what are the levels of student/teacher and student/student interaction in online courses;

which online tools might best hone the learner's practical skills to enhance future employability.

Participants agreed that user support systems are needed, although the level, source and type of support would depend on the OER model adopted. Participants viewing OER as 'academic publishing' (rather than e-learning) emphasized the importance of the development of self-supporting online user communities. Those created around courses in Utah State University's Open Learning Support are one example of this sort of community. Users may also have the possibility of asking questions or requesting clarification from the course instructor through e-mail or discussion forums, although many large-scale institutional course publishing initiatives, like MIT OCW, do not encourage this (e.g. email addresses for course instructors are not published alongside materials).

Where OER are designed specifically for online teaching and learning, user support systems may be built into the resources themselves. For example, Carnegie Mellon's OLI courses are designed to simulate much of the feedback traditionally provided by an instructor, and when Carnegie Mellon students use the courses as part of their programme of study, their actions are logged and the information fed to the instructor. The rationale is to gain insight into learning methods and identify areas where additional student support might be required.

Several participants indicated plans to undertake further studies on the user experience of OER, and to experiment with new support mechanisms, such as virtual cohorts of learners.

Standards, quality assurance and accreditation

Should OER be subject to the formal (or even informal) quality assurance and accreditation processes that prevail in traditional higher education settings? If so, how would that be achieved? Would accreditation constrain the development and the use of open content for the delivery of higher education?

Some contended that there would be more confidence in and acceptance of OER if assessments were made for quality assurance, perhaps using internationally established standards applied by a global accrediting body. Another approach could be university consortia (rather than international governance) that set and maintain quality standards. It was argued that it is in the self-interest of content providers to respond to accreditation, certification and quality concerns so as to establish their offerings as standards in the field and as sources of customization for OER users.

Quality assurance is perhaps of greatest concern to the users of 'grassroots' OER initiatives – open collections that welcome content from anyone who wishes to contribute it (e.g. Rice University's Connexions and many Learning Object Repositories). Many such initiatives have adopted peer review and reputation management systems, to give users a guide to the

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quality of the materials on offer. Measuring quality, however, is far from straightforward; 'high quality' materials in one context may not be considered 'high quality' in another. Connexions has addressed this issue by developing 'lenses' through which materials can be viewed. A user – be it an individual, an institution or an organization – sets up their own review process, then selects the modules and courses that meet their quality standards. When Connexions is accessed through that user's lens (or portal), only the materials they deem 'high quality' may be viewed.

It is clear that these issues of standards, quality assurance and accreditation will only grow in significance as the OER movement becomes more established and as the volume of content, and the number and range of users increase.

Faculty members and OER

Two sensitive areas relating to OER in higher education concern:

- the involvement of faculty members in creating and sharing open content, and
- the appropriate use of that material through acceptable credit and recognition, and within the legal parameters of copyright law.

The key component of OER is the educational content, and the essential source is the instructor who provides that content and agrees to make it freely and openly available. Whether OER is driven by 'top-down' institutional systems or 'bottom-up' individualized initiatives, the higher education faculty member is pivotal to creation of the educational substance.

Securing the backing and involvement of faculty members is therefore a major priority for institutions involved in OER development. There was widespread debate about the level of staff participation needed to ensure broad subject area provision, up-to-date material, and a comprehensive curriculum. The quality, relevance and amount of OER content are in large part a function of the time and effort devoted by the faculty member to the course.

The greatest concern is the time that is required from academics to prepare elements of a course that will be available, monitored, maintained, updated and perhaps re-formulated for new settings and different uses. Open content enthusiasts may be prepared to devote time to creating and adapting materials to a form suitable for open distribution. However, in the case of a large-scale institutional initiative that engages the majority of the teaching staff, any substantial time commitment would be a major barrier to participation. Many faculty members at MIT, working at full capacity and wary of taking on a project that could detract from teaching and research commitments, backed the OCW initiative on condition that it not add significantly to their workloads.

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In the case of the MIT model, where open content is comprised of materials that the faculty member uses in classroom instruction, once instructors consent to distribution of the material, their involvement generally is confined to providing updates as needed and responding to the occasional content query that cannot be handled by OCW staff. An advantage to this minimalist approach is that faculty members are more willing to contribute their materials to the expanding worldwide catalogue of OER offerings. Some participants questioned whether this was setting the bar for participation too low; offerings may be rudimentary or have little application beyond a specific classroom setting. In these relatively early stages of the movement, should the drive be to produce exemplary OER, at the risk of excluding potential contributors, or to welcome all contributions and focus on creating a 'critical mass' of OER? Ultimately, where the bar is set depends on the OER philosophy ascribed to – OER as course publication or OER as distance education.

Providers, working with interested institutions and academics already involved with OER, can help to enhance staff awareness of the benefits, practical aspects and potential complications of OER development. Two major approaches were advanced to attract more faculty members onto “this visionary OER bandwagon” and show the way for enhanced quality of the OER offerings in the long-term:

collaboration and joint content development among academics, and
incentives for faculty members to contribute high-quality material to the worldwide body of OER.

Joint content development

While there are examples of collaboration among academics in developing joint content (see, for example, the digital signal processing curriculum in Connexions), the largest proportion of existing OER materials are originated by an individual faculty member. Increasing the pool of available expertise and resources would lead to the production of better teaching and learning materials.

One approach would be to create 'communities of scholars' in each specific discipline, with the members collaborating to develop and share their scholarship. This should lead to higher quality OER since faculty members would be sensitive about meeting the academic norms of their discipline. If OER materials are going to be judged by their peers, the developers are likely to devote more time and effort to producing a quality project. Making institutions and academics aware that a large audience around the world is scrutinizing these products helps to create an internal quality control.

“Authorship, attribution, and authority are the cornerstone of scholarly communities,” noted one participant. “The key to moving to ‘open’ content online is to ensure these norms are respected and preserved.”

Incentives for faculty members

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Very few institutions have implemented incentive programmes for instructors to either produce or use OER, mainly due to institutional reticence and a deeply entrenched academic culture. In part, this may be due to mounting pressures by universities to claim ownership of staff research in order to generate profit and to enhance institutional competitiveness.

Incentives – especially financial incentives – were viewed as particularly important for academics in developing countries. In situations where salaries are very low, the preparation of materials can be a valuable additional source of income. Moreover, the prevalent research climate, which links promotion to publication in international (i.e. from developed countries and generally restricted access) journals, does not give priority to the development of locally published, open-access materials.

With little or no institutional or peer recognition or encouragement, there is little incentive for faculty members to take on the extra burden of developing and refining OER content. Further staff involvement in the OER movement could be stimulated through the existing recognition and reward systems of the higher education community. Various incentives were suggested. They included:

- adding OER to portfolios that are presented for academic promotion and tenure;
- awards for outstanding development, production and dissemination of OER materials,
- integration of open content as a standard element in scholarly training and practice;
- incorporating the concept of ‘open content’ and production of OER into scholarly training and practice for both academics and managers;
- adoption of institutional policies that encourage opening educational content and valuing the creation of such materials (including in tenure and promotion processes).

“We should evaluate and value the creation and provision of open materials just as we do textbooks or other work that improves education,” asserted one participant. The creation of OER should be viewed not as an additional burden but rather as an integrated part of the scholarly endeavour that is useful, first and foremost, to a faculty member’s own teaching, scholarship and career.

Intellectual property and copyright issues

The issues surrounding intellectual property and copyright can be some of the thorniest areas for faculty members and institutions taking their first steps in the OER movement. There was a suggestion that the issue of copyright and ownership of material is “the root cause of slow development in this field,” inhibiting some faculty members and institutions from making more educational content available to the online community.

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Many academics incorporate copyrighted third-party content in their teaching materials – a practice that is permissible under educational ‘fair use’ guidelines in normal copyright law. Penalties for contravening these guidelines – by making such content available to the general public on the Internet for instance – can be strict. Faced with this risk, many institutions have preferred to lock away course materials behind firewalls and in password-protected pages, rather than devoting scarce time and resources to creating ‘clean’ versions, free of copyrighted elements.

Institutions may also be reluctant to see the creative and scholarly work of their own staff made available without due compensation for the costs involved. There are those who believe institutions are less willing to share knowledge than the academics that create it, and who wish to work in the ideal of an open scholarly community.

One faculty member within the forum stated the academic staff perspective directly: “We as faculty are not afraid of others using our material in their academic work, but we are profoundly afraid of someone taking our work and claiming it as their own, and perhaps even copyrighting it themselves.”

Another participant argued that rather than focusing on legal copyright infringement, a more helpful approach for individual faculty members offering OER might be to enforce good behaviour through promoting scholarly values and norms. In practice, an academic may not have the means to pursue someone through the law, and if someone is found to be profiting from or appropriating another’s material, the academic community is more likely to react against the breaking of the scholarly norms of attribution and respect for authorship than the infringement of copyright law.

The Intellectual Property Rights of open content creators do need to be protected, however. Default copyright law is too restrictive, and customized open licenses a complex and expensive option. Creative Commons was developed to provide an alternative. A number of different intellectual property licenses are available, with a range of restrictions to use, designed to facilitate the open use of knowledge and creative works. “For the creators, it provides some assurance that their work will be acknowledged by anyone using the open resources they have created. For users, it provides a degree of assurance that they can draw upon open educational resources without fearing subsequent litigation about copyright as long as they adhere to the terms of the license.”

Lawrence Lessig described Creative Commons licenses, which are used worldwide in increasing numbers, as: “Legal tools to further enable the collaborative process in education, and elsewhere, that the technical tools of the Internet now beg us to advance.” One of the key features of the licenses is that their terms come in a ‘human-readable’ version, written in plain, non-legalistic language. This makes it easier for the creator to define the terms on which their content can be used, while making it harder for the user to claim that they broke those terms because they couldn’t understand them.

There was acknowledgement, however, that in general copyright options are not readily

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known or understood. Open licensing, said one participant, “Is one of the most confusing and difficult issues associated with OERs and could make or break the open content movement.”

To address that confusion and difficulty, ‘marketing’ materials are being prepared by Utah State University’s Center for Open and Sustainable Learning for teachers and academics concerning intellectual property issues and the potential benefits and risks of sharing through OER. “The focus of these materials will be to (1) encourage educators to engage in open sharing, (2) help them to understand the terms of the Creative Commons licenses, and (3) help them to understand the risks and benefits of openly sharing educational materials.”

Challenges for users of OER

The spread of Open Educational Resources through digital technology offers a substantial educational opportunity. How best to utilize that opportunity was a focus of the third session of the forum, with an array of examples presented and discussed by Mohammed-Nabil Sabry (Université Française d’Egypte), Peter Bateman (African Virtual University), Pedro Aranzadi (Universia) and Derrick Tate (China Open Resources for Education).

All four initiatives utilized MIT’s OpenCourseWare, allowing for comparison between the different approaches that were adapted to assorted settings, cultures and users – both individuals and organizations. Mohammed-Nabil Sabry described the Université Française d’Egypte’s experience of adapting four OCW courses for use in Egypt, while Peter Bateman highlighted some of the key challenges of introducing OER in Africa. Universia and CORE both came to OER through translating OCW courses; they have subsequently expanded their scope to promote the creation of original OER in their respective regions. (See Background Note to the third session.)

It was contended that OER could be improved most effectively by shifting from a ‘provider-user’ model to one that employs collaborative development. There was a consensus that OER could be more useable and more relevant if the entire education community – not just providers – were engaged in developing modules and adapting them to localized situations. Volunteers were perceived as valuable in this regard to help transform content into relevant educational resources and to be trainers and online facilitators.

Creating such an environment of collaboration and volunteerism are just two of the challenges that face OER users. Others include language differences, cultural barriers, local relevance of materials, access concerns, and the availability of adequate technical resources (infrastructure).

Access issues and infrastructure

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Open Educational Resources need to be accessible to those who need or want them. An inadequate Information and Communication Technology infrastructure, especially in less developed countries, is an obstacle to the dissemination and use of all OER, and especially those that offer more than just basic textual content. There is a need to collaborate to make virtual environments more accessible to underserved groups.

As one provider put it: “There is a trade-off between using the latest technologies that provide rich virtual environments, simulations, and robust feedback that will deliver a more effective learning environment but that require high bandwidth and limiting the environment to low bandwidth forms of delivery (text).”

The challenge is to work with areas where bandwidth and technology are limited to build effective OER. One perspective was that a low technological threshold encouraged materials from all cultures that lead to new OER that is richer and more diverse. In the longer term, however, advocates of OER must address the political, economic, and technical problems that hamper the distribution of sufficient bandwidth and not be content with downgrading educational offerings to their most basic levels.

Some technical difficulties are being overcome in developing countries. More teachers, students, professionals and others are able to access OER and adapt them effectively for their local circumstances. For example, the African Virtual University (AVU) established pilot OCW ‘mirror sites’, (i.e. local server storage) at institutions in Kenya and Ethiopia to widen access in areas where low bandwidth would make it difficult to fully utilize the MIT website. These mirror sites can be updated remotely. In some developing parts of the world, the challenge has shifted from obtaining the essential technology to managing the array of available educational resources so that they are of maximum benefit to young scholars.

It was pointed out that African academics are using and producing educational materials, but in many cases they remain inaccessible to new users, partly because of poor infrastructure, but also because of a lack of familiarity or confidence with technology. Training and support for new users was felt to be vital to the success of OER in developing countries. Participants were reminded that the success of this forum has been incumbent on their own computer skills; skills that many faculty members in developing countries may not have, or may not feel comfortable using. As a consequence, the development of support structures for potential users (and providers) is a central feature of the AVU’s OER strategy.

Learning Object Repositories

Beyond technological hurdles, users must be able to locate and work with the increasing amount of open content information that is available. As noted by Susan D’Antoni: “Open resources are not much use if they cannot be found.” Using a regular search engine generates too many references, most of which are likely to be irrelevant. For this reason, OER must be ‘tagged’ – metadata must be attached to them that allows more directive

UNESCO. VIRTUAL UNIVERSITY AND E-LEARNING

searches (e.g. searching by academic subject, level of education, type of resource etc.) and helps users understand the educational context for which the materials were originally created. Participants agreed that identifying, tagging and organizing resources for easy retrieval and re-use should be a priority of the OER community.

Learning Object Repositories are one way of organizing educational resources. (David Wiley has defined a Learning Object as: "Any digital resource that can be reused to support learning.") The example presented was MERLOT (Multimedia Educational Resource for Learning and Online Teaching), which has almost 13,000 online teaching and learning materials identified in its repository. This free and open resource is designed primarily for faculty members and students in higher education, with links to online learning materials and annotations that include peer reviews and assignments.

Peer review is an important element that serves to assure users concerning the quality of the content of online OER. MERLOT, for example, established editorial boards within each discipline to assess OER content quality, its ease of use, and its potential effectiveness for teaching and learning.

The MERLOT model also attempts to engage the user community in shaping the open content to apply to varied educational objectives. "Within MERLOT, one person can author the content, someone else can find it and contribute it in MERLOT, other people can write different assignments for using the materials in courses, different people can write comments, and another set of different people can create 'personal collections' that get shared," noted Gerry Hanley of MERLOT. "Everyone does a little bit, and, collectively, you can create a rich teaching/learning resource." Such an unfettered community-building technique is not without its difficulties, however, since content variations may abound. Once again, repositories look to original contributors, peer reviewers and the user community to keep online catalogues updated, fresh and vibrant.

Forum participants contrasted the Learning Object Repository approach with the structured course-based approach that has been traditional in higher education. While there are advantages and disadvantages to each, the course publication method tends to be more static than the adaptable learning repository approach.

Language and cultural barriers

OER are cultural as much as educational, in that they give users "an insight into culture-specific methods and approaches to teaching and learning" – a practical exposure to the way that courses are 'done' in another country or by another instructor. Language is clearly intertwined with culture in this dynamic. The vast majority of Open Educational Resources are in English, which is spoken by perhaps 10 per cent of the world's 6.3 billion people. Not only does the English language dominate OER provision, but English-language content tends to be based on Western learning theory. This limits the relevance and accessibility of OER materials in non-English, non-Western settings. There is a risk that language barriers and cultural differences could consign less developed countries to the role of OER

UNESCO. VIRTUAL UNIVERSITY AND E-LEARNING

consumers rather than contributors to the expansion of knowledge.

To illustrate, several discussants indicated that faculty members at their institutions expressed reservations about content produced by a foreign institution. According to Peter Bateman, “While most [African academics] were clearly appreciative of being able to access such a wealth of resources so easily now, some...expressed a resentment of these ‘imported’ materials, asking ‘Why can't we produce these materials here?’” There was some concern that institutions in developing countries would become dependent on externally generated content, rather than the content serving as a catalyst for the production of new, local OER. Some of this tension may be resolved through progress in moving towards collaborative development models.

The conditions under which OER are created, the languages used, and the teaching methodologies employed result in products that are grounded in and specific to the culture and educational norms of their developers. This may be remote from the understandings of other cultures and lead to (1) dysfunctional education, and (2) a reduced potential for developing countries to contribute research, training, experiences and understanding that invigorates the value and scope of OER. Language translation offers at least a partial solution to this two-pronged problem. Partial, for as one authority on these matters observed, “If the full benefits of these (OER) resources are to be realized, it is necessary to have a real capacity for the adaptation of language – rather than mere translation – to the needs and modes of understanding of local contexts.”

Both Universia, a consortium that maintains higher education portals for Spanish- and Portuguese-speaking countries, and China Open Resources for Education (CORE), began their involvement with OER by translating MIT's OCW courses, with the aim of making high-quality content available in their respective regions. Both organizations have also addressed issues of cultural ‘sensitization’ and local content generation. Universia has shifted its focus away from translation to helping member universities to publish their own OER. CORE, while continuing to support the translation of materials, also works to promote the OER movement in China and bring Chinese content to the rest of the world.

Some participants championed translating OER content into the native language of the learners for understanding and utilization and for “collective ownership, which is the bedrock of the OER success.” There was recognition of the importance – and difficulties – of the translator's job. Localizing OER material is not only a question of language but also one of culture. It is important to be aware of cultural and pedagogical differences between the original context of use and the intended new use of the material. Even translators who are native speakers and are living in the country may find it difficult to provide context for an unknown audience, leading to quality control problems. In addition, translators are not necessarily instructors, and may not have the pedagogical background needed to contribute new content effectively. It was suggested that a database of academics who could also function as translators be created for the OER community to assist non-academic translators. Another solution would be to develop partnerships with local academics and institutions, or to embed volunteer translators within OER service

UNESCO. VIRTUAL UNIVERSITY AND E-LEARNING

communities. Further refinement of presently inadequate translation software could lessen this need for a multitude of human translators, although it is doubtful whether automatic translators could ever be sophisticated enough to produce a truly meaningful translation. The creation of a multilingual platform that supports knowledge sharing between different parts of the world was also identified as a necessary step if OER is to be a democratic and inclusive movement.

Multilingual platforms and dynamic collaborative environments, in which multiple users can come together to create and edit material, are undoubtedly desirable. However, they pose particular problems for translators: if material is constantly changing and a stable version is not available, how can a translator firstly keep track of the changes, and secondly decide at what point a new translation becomes necessary? While acknowledging this difficulty, it was suggested that the provider-user communities, aided by volunteer translators, could track changes or respond to user requests.

It was suggested that content development using a modular approach could facilitate local adaptability and reusability, although several participants noted that this might be too 'unstructured' for some users. The translation of materials was generally reported to take place at the individual modular level, as this enables the ongoing modification of material to be incorporated as the translation is being prepared.

Several participants appealed for a shift away from the 'top-down' approach to OER content creation. Rather than attempting to create OER that can function in every context, the emphasis should be on developing material that solves "specific instructional problems, and makes sure that a given solution at least works for someone." The idea is to enable other institutions to adapt these materials to meet their specific institutional and local needs. In addition, user institutions could take responsibility for adapting courses for local relevance of content and to meet market demands.

It was suggested that the translation of OER into 'mother tongues' could, as a by-product, prevent the loss of languages now threatened with extinction. A cautionary note in this discussion of language and culture, however, was that students most likely need new languages to thrive in a global society. "In a more global world, adopting a localized approach to knowledge and learning will ultimately reduce opportunities for those who do not access language other than the mother tongue," argued one participant. "This will definitely widen the gap between 'haves' and 'have nots'."

Some advocated a balanced approach as more productive in the long run. They called for the translation of OER as needed but matching that with new-language training and improved teaching skills and teaching materials. The teacher is the key here — making use of information in a foreign language; adapting it to native tongues, cultures, and contexts; and then conveying it to others. On a practical level, it was suggested that few people will learn a new language if it is only needed to acquire more knowledge, whereas they may do so if it offers the chance to improve their livelihood or quality of life.

Seeking global balance in OER

For open educational content to realize its full potential, it must be available and relevant to the developing countries of the world. That cannot be a one-way street with developed countries responsible for producing OER and the less developed countries confined to consumption. In short, global balance is required.

A troublesome imbalance now exists between the provision of OER on one hand and its utilization on the other. Participants were quick to identify this imbalance and exchange views throughout the forum on how best to remedy the “poverty of educational opportunity” that exists across the world. David Wiley commented that, “When educational materials can be electronically copied and transferred around the world at almost no cost, we have a greater ethical obligation than ever before to increase the reach of opportunity.”

Significant obstacles must be overcome before lower-income countries are able to fully participate in the development and use of OER. As noted earlier, those barriers include poor connectivity, inadequate infrastructure, funding constraints, local resource shortages, technical inadequacies, lack of training and support, and linguistic and cultural differences.

The technical and programmatic dominance of developed countries undermines the potential for developing countries to build on their own knowledge and research. “The development of OERs against this background is necessarily compromised,” it was argued. “Where is the body of locally relevant knowledge that can be drawn upon to build educational resources? Where are the readings and data sets that lecturers and students can draw upon? Where are the case studies and records of local experience that can inform the development of assignments?”

There was an acknowledgement, however, that “something is better than nothing and that the OER resources that are being developed are an extremely valuable resource.” Indeed, others argued that there is a wealth of multicultural and multilingual educational resources in Africa just waiting for the structures and resources to transform them into OER. That does not negate the need to develop new and original OER in and on behalf of Africa, South America and Asia. Significant efforts are underway in all of those areas to create OER that is culturally sensitive, educationally and locally relevant, technically feasible and accessible.

A major challenge is to build instructional design capacity in the developing world. Lacking this, a handful of international ‘brands’ will dominate. The support of instructional designers would allow authors to become more active in OER production and to adapt content to meet their specific individual and institutional needs. On a related note,

UNESCO. VIRTUAL UNIVERSITY AND E-LEARNING

partnerships between countries could promote capacity building and training of local staff in OER production and use.

The forum was advised of one such collaboration: an initiative to foster OER development among 22 small states of the Commonwealth ('small states' being defined as those with less than 4 million inhabitants). The Virtual University for Small States of the Commonwealth (VUSSC) is designed to build a network that will allow states with limited resources and technology to develop a capacity for online and distance learning. OER will be developed in areas of shared need, including life skills, business and management, and professional development in education.

As the forum was underway, announcements were made at the World Summit on the Information Society (November, 2005) concerning a new Internet initiative to connect the world's citizens to high-quality educational materials on a free basis. The Development Gateway Foundation's Open Educational Resources portal aims to equalize access to education and "help people in developing countries improve their chances for a better life." The William and Flora Hewlett Foundation, which supported this IIEP open content forum, also announced at the Summit that it is providing new funding to train teachers in sub-Saharan Africa with open content resources in literacy, numeracy, science, and in life and health skills. The project will be led by the AVU and the UK Open University.

Promoting the OER movement

The objective of the IIEP forum was to increase awareness of current developments and the future potential of Open Educational Resources. By the conclusion of the forum it also had acted as a catalyst for stimulating collaboration among individuals, institutions and organizations interested in refining and intensifying the OER movement. A desire to assemble communities of common interest and purpose was a clear outcome from the six weeks of intense and productive email dialogue. To this end, there were various suggestions advanced:

- creation of a broad-based international community on the expanded development and use of OER;
- communities of interest to invigorate OER in less developed parts of the world;
- interest groups focused on increasing OER within specific academic disciplines;
- groups to analyze the uses and the effectiveness of OER, to identify gaps in the knowledge base, to raise research questions, to refine methodologies, and to propose guidelines for further OER development;
- new studies of user experiences with OER and experimenting with new user support mechanisms;
- the identification of best practices and collaborative successes that result in effective OER offerings;
- an association of university and college teaching staff who produce or may be

UNESCO. VIRTUAL UNIVERSITY AND E-LEARNING

interested in producing online teaching.

In stressing increased collaboration among and between providers and users, the forum endorsed the concept of shifting the philosophical underpinning of OER from “knowledge for all” to “construction of knowledge by all.” “If we can get away from the provider-user paradigm and move toward a collaborative model for OER creation, organization, dissemination, and utilization, we will have achieved much,” noted one participant.

Proposing a role for UNESCO

In reaction to the varied ideas put forth for developing, promoting and using OER, a number of participants urged UNESCO and its International Institute for Educational Planning to supply an overarching “canopy for the different groups without caging their potential or particular approaches.”

Specific suggestions espoused for IIEP and UNESCO included:

- sponsoring future discussions that focus on OER effects in developing countries and how these nations might participate in and contribute to the open source movement more fully;

- assisting (upon request) in constructing some of the various communities of interest that were proposed during the forum’s discussions;

- moderating and managing repositories of OER information on the Internet;

- spearheading a flexible but reliable mechanism for international accreditation of OER offerings;

- co-ordinating a database of translators for OER materials and establishing standards for this multi-lingual resource.

Return to report

Next steps

The immediate next step is to form an international Community of Interest to support ongoing information sharing and an exploration of the most important issues related to the provision and use of open course content, as identified during and at the conclusion of the forum.

A second forum will be held in late 2006 to share and discuss the draft report of an OECD Centre for Educational Research and Innovation (CERI) study of OER in tertiary education. The purpose of the study is to map the scale and scope of current OER initiatives, and to address four questions concerning:

- the development of OER initiatives;

- the development of sustainable cost/benefit models;

UNESCO. VIRTUAL UNIVERSITY AND E-LEARNING

Intellectual Property Rights, and
improving access to, and the usefulness of, OER.

Following that forum, it is anticipated that an international Community of Practice will be formed to link practitioners from around the world to work together, and to continue sharing information and experience.