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Open Educational Resources: new directions for technology-enhanced distance learning in the third millennium

Andreia Inamorato dos Santos, The Open University, Milton Keynes, UK
Patrick McAndrew, The Open University, Milton Keynes, UK
Steve Godwin, The Open University, Milton Keynes, UK

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ABSTRACT. The Open University UK launched OpenLearn, an Open Educational Resources Website, which allows the user to browse through a selection of units of learning material, covering all subject areas. OpenLearn offers tools to enable social learning, such as a videoconference system (Flashmeeting), discussion forums, learning journals, an instant message system (MSG), and a software for the creation of knowledge maps (Compendium). The primary learning content from OpenLearn is placed in the LearningSpace, an open learning environment, built automatically from content described in XML, and running within the Moodle open source learning environment. The initiative is also producing an equally large collection of material that is in a less processed state: this is placed in a LabSpace to emphasise its more experimental nature. LabSpace content is intended as more suitable for educators, but there is no particular barrier to learner use of the content and, in some cases, LabSpace content provides the largest collections of material from a single subject. OER initiatives must have some sort of funding model. Three of the most common ones are highlighted: external funding, institutional funding, and government funding. OpenLearn is currently located in a mixed-mode approach, because it counts on funds from its sponsor (William and Flora Hewlett Foundation), and from the Open University UK itself. Though other models are being analyzed, such a kind of approach is likely to be maintained.

KEYWORDS: *Creation of knowledge, E-learning tools, Learning content, Mixed-mode funding approach, Open source learning environment*

Introduction

Open Educational Resources (OERs) are an innovation giving new opportunities for learning and distance education. OERs are typically provided as courses, but also include smaller units of

learning, and their components of audio, text or image files, made available on the Internet, free of charge; usually, under a Creative Commons License (Creative Commons, 2007). This license takes the approach of 'some rights reserved' for the materials, replacing the 'all rights reserved' attitude of standard copyright (Lessig, 2004). Distance education, based on OERs, removes limits, and offers the possibility of widening participation in education. This can include hard-to-reach groups, which have little or no access to education or, for example, small businesses, and individuals, who feel they could benefit from professional development, and access to current knowledge about a topic of interest. The release of OERs can be a public good for educational inclusion purposes, but they also could mark the first steps towards a revolution on the way people learn. So far, access to knowledge, as taught at university level, has been restricted to academic institutions. These institutions, not only create the knowledge, but also have regulated the ways in which it can be accessed. A pattern is in place of establishing course registration procedures, charging fees, conferring grants, assessing performance, and awarding degrees. These mechanisms form part of a traditional system of education, that can be found all over the world.

With the provision of educational materials for free on the Web, this scenario starts to change. This is not to say that the conventional educational system is going to die or is under threat, rather, it is opening up new ways of creating and distributing knowledge, which go beyond the formality, established within the boundaries of the universities' walls. Open Educational Resources enable other open aspects of working, and enable us to explore the potential of the 'participatory Web', a robust model of creating content online, with the collaborative work of many individuals. Examples are open source software, open research, news, literature, and educational materials, among many possible others. Open Educational Resources, under a share-alike license, can be re-mixed, culturally adapted, translated, and modified in various ways. They represent the beginning of a new way of doing online learning, a model that started with the Web 2.0 technologies (O'Reilly, 2005), and that has the potential to mark the third millennium, in technology-based distance education. This new model includes user-generated content, life portfolios, virtual learning communities, educational Wikis, and a variety of other

ways of producing and sharing knowledge over the Web.

Open Educational Resources have a role to play, in this emerging view of education. The challenge that is faced is to create sustainable systems to forge and support these activities, enabling the citizens from all over the world to engage in this new exciting way to learn, and to create and manage knowledge. With this in mind, the Open University UK launched OpenLearn, an Open Educational Resources Website, which allows the user to browse through a selection of units of learning material, covering all subject areas. OpenLearn offers tools to enable social learning, such as a videoconference system (Flashmeeting), discussion forums, learning journals, an instant message system (MSG), and a software for the creation of knowledge maps (Compendium). OpenLearn is one among a number of other Open Educational Resources initiatives that share knowledge for free. OpenLearn, in this paper, serves as an example to explore the various possibilities and challenges in the provision of Open Educational Resources, in the third millennium, among which sustainability is a central issue. It builds on the work of the OpenCourseWare movement (Vest, 2004) in offering material from established and valued courses, but also gives an indication of future direction, by giving attention to tools for learners and educator, and by valuing community alongside content.

Content within OpenLearn

In this paper, the focus is on how OERs can sit along with other tools to offer new opportunities; however, at the core of OER initiatives, such as OpenLearn, is the content. This does not mean that the content provides the entire learning experience, and indeed the Open University has a model of Supported Open Learning, that considers learning experiences around well-designed learning materials, alongside tutor-based support and assessment. Tutor support is typically in a small group (around 20 learners), working together as a cohort. Assessment is provided as a means to recognise and reward work, but also acts as a motivator in itself. In OpenLearn, the materials aspect is separated from the human support and, in a two-year period, it aims to provide 5.400 hours of learning units, for the most part taken from existing Open University courses.

The materials are changed in various ways:

- they are selected from full courses, as self-contained shorter activities; typically 3-20 hours, in comparison to full courses, that last 100-600 hours of study;
- they are presented entirely online, whereas many courses have a printed course guide to help study;
- tutor support, encouraged through assessment, is replaced by electronic tools for support, that are entirely optional.

Beyond the changes to format and structure, that apply to all material that is placed on OpenLearn, some of the content is also given additional treatment, either to bring out interactive elements, or to rework the material in a more experimental way to try out the opportunities available, in moving to an online platform. Thus, while it is usual to try to keep integrity with the original material, greater variation is being considered as the initiative develops (Lane, 2006).

The primary learning content from OpenLearn is placed in the LearningSpace, an open learning environment, built automatically from content described in XML, and running within the Moodle open source learning environment (from now on, simply referred to as Moodle). The initiative is also producing an equally large collection of material that is in a less processed state. This is placed in a LabSpace to emphasise its more experimental nature. LabSpace content is intended as more suitable for educators, who might take the material, and reuse it, either by making selections within it, or by editing in links to more recent content. However, this is a difference in emphasis only, and there is no particular barrier to learner use of the content and, in some cases, LabSpace content provides the largest collections of material from a single subject.

The impact of content

Providing content from distance learning courses means that even text-based units are seen as engaging by those learners who spend the time to work through the material. This is seen in feedback, that the OpenLearn research team has gathered from enthusiastic users of the site. It is also misleading to consider the OpenLearn material as having only text: 90% of the courses incorporate

self-study directions for reflection and questions, and the site has over 200 video clips, and a further 100 Flash movies and interactions. The site also, though, needs to address an audience of users, who are not yet engaging with the content, those users who are not spending enough time on the site, either to read the material, or take part in activities. Many of these users would come across the site either through keyword searches or by following links and, other than a brief interest, are neither intending to study nor spend the time necessary to work through difficult concepts. It is our belief that for some, though, we need to provide stronger connections into the learning materials. We seek to do this through emphasizing community, and tools that work alongside the content.

Technology-enhanced learning in OpenLearn

OpenLearn offers various tools to enable a participatory pedagogy for learning on the Web. In this paper, we consider three of them, aiming to follow up with a discussion of the affordances of such tools in supporting open learning. They are: open discussion forums; MSG chat and presence map; learning journals.

Open discussion forums

Every unit (course) in OpenLearn by default has an attached discussion forum, and a further forum for reviews of the unit. The OpenLearn learner browses all the units in OpenLearn, and chooses one (or more) of their interest. Access to the content of each unit is unrestricted; however, to use many of the tools, such as the forum, they need to register. OpenLearn registration is free, and just requires a username, and an e-mail address. Once the optional registration is complete, the learner has access to all the tools the Website offers, and is also to enrol in the unit of their choice, and be included in the list of all registered learners, in that unit. Therefore, the learner will be able to find other users studying the same unit, and contact them for some peer learning, if they wish.

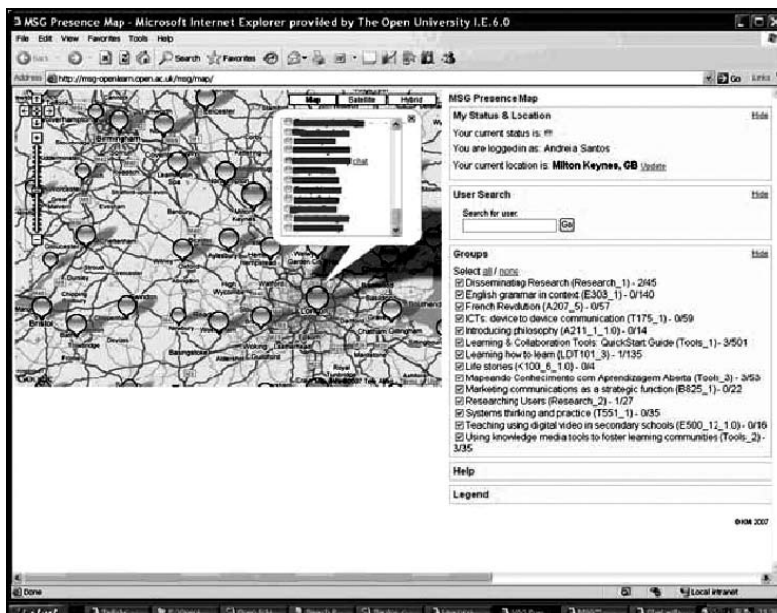
The idea behind the provision of a forum, attached to each unit, is to give the users the opportunity for social learning. They are able to start learning communities, if they wish, with people from all over the world, who share similar interests. Learning communities can also be described as communities of practice (Wenger, 1998).

Communities of practice see learning as a social system. They can be defined as a joint enterprise, continually renegotiated by its members, counting on the mutual engagement that bind members together into a social entity. The product is the shared repertoire of communal resources, that members have developed over time (Wenger, 1998). Wenger claims that “building a community is not just a matter of organizing community events but also of enabling a rich fabric of connectivity among people” (Wenger, 2000). In this scenario, then, OpenLearn acts as a broker of the relationships between the users, people who need to learn, and people who can offer learning opportunities.

MSG chat and presence map

MSG is an instant messaging tool, that works as a ‘personal radar’ for OpenLearn users. It shows the learner who is online, and allows them to send messages directly to relevant individuals (OpenLearn Team, 2007). MSG has been developed by the Open University, and is open source. It differs from other instant messaging products, because it automatically shows all the users registered in a given unit, enabling the learners to ‘get in touch’ with other fellow learners, in one click. It also offers a presence map to show where other users are located, and it is fully integrated to all OpenLearn units, so the user can see who is currently online. Below is screen capture of the MSG presence map.

Figure 1. MSG presence map



There are many advantages of using presence maps and instant chat in open learning systems. First, the chat enables instant communication between learners synchronously online, without the inconvenience of having to wait for an e-mail to be sent. The presence map helps the learner realise that 'they are not alone', while studying as a self-learner. It gives them the chance to initiate some communication, if they feel they will benefit from it.

Learner appropriation of the technology

The use of new technology can be considered as a combination of the affordance of the technology (Conole, Dyke, 2004), that is what it is well suited to, and the acceptance of the technology by the user considered as appropriation (Waycott, 2004). In the start-up phase for OpenLearn, we can see both of these aspects in action for the three examples of technology considered in the paper.

The use of some of the forums on OpenLearn supports the concept of social learning. For example, on the site, it is possible to see exchanges between learners, discussing whether those for whom English is a second language would be able to cope with study, how groups can be formed for self-study, and some of the

detailed exercises from within the units. On the other hand, many of the forums have remained empty, as learners are faced both with how to start relevant discussions, and the need for critical mass, inside each unit, when users of OpenLearn are given the choice of several hundred units, and forums where they can spend their time. These issues will change, as the system moves beyond its start-up phases. In addition, we can address this as a research issue, by considering how to support participation, and increase the affordance for learning, offered by the forums, through framing appropriate questions, providing moderation, or consolidating forums across related units. We can also see some evidence of increased appropriation of the forums by users. Forums themselves are well established as Internet tools, but the unit-specific forums raise extra challenges for the user, as they are unsure of the commitment and level of interest of other users. Particular forums are emerging as busier than others; even though, by other measures, the units involved are equally busy, this suggests that an appropriation of the forums is taking place in some communities, but has yet to reach the point, where it is sustained across the site.

MSG is a new technology, that has some relationship with familiar messaging technologies, but also important differences. Most messaging technologies focus on providing a personal service, whereas MSG is context-dependent on interaction with the OpenLearn site, and the units within it. At launch of the OpenLearn system, in October 2006, MSG had limited features, in particular, no visible mapping, and was considered untested technology. As a result, MSG was given a more tentative launch on the LabSpace site only. In the first few months of the project, the LabSpace has attracted around 10% of the visits of the main LearningSpace, which limited the usefulness of a tool, designed to show presence, as well as support synchronous chat, that depends on enough people being in the same context, at the same time. These issues were addressed through development of the map interface, which makes its presence function more obvious, and by moving MSG into the LearningSpace. These changes are recent, at the time of writing the paper, and have yet to be fully assessed. Feedback from presentation to users emphasises that the maps have changed the image of MSG and, through its embedding in the site, of the site itself. The presence affordance has now been emphasised to the

casual user, but may now mask the synchronous communication elements. We are now seeking to monitor the appropriation both of the mapping and chat by user groups, within OpenLearn.

Further tools

The two tools described above are only two examples from the range of tools available in OpenLearn. Tools come from the adoption of Moodle as a platform, from development within the initiative, and through the opportunity to use other tools from the Internet. From Moodle, in addition to forums, a notable tool is the learning journal. This is termed a blog in standard Moodle, but has been renamed in OpenLearn to distinguish it from more usual blogging systems. The learning journal offers the user the chance to capture, and share their reflection on working through the units. Other developed software includes the Flashmeeting (<http://flashmeeting.open.ac.uk>) video conferencing system, that enables very low barrier recorded group discussions, and the Compendium knowledge mapping tools. These were launched in LabSpace alongside MSG, but have now made the transition to the LearningSpace to be available to a larger number of users. In each case, we can see interesting examples of use, but feel they have yet to be appropriated at the scale that is possible, in a site that is expected to have more than 1 million unique users, on an annual basis. OpenLearn has also encouraged reuse outside of the main host site; ways in which this is enabled by the choice of XML as the core content format are discussed in McAndrew and Hirst (McAndrew, Hirst, 2007), and the new approaches of Web 2.0 technology are enabling a range of low effort spin-off sites to be produced. OpenLearn networks have been created with a primary aim to increase awareness of the opportunities available through OpenLearn, in such systems as Ning, MySpace, Netvibes.

Sustainability of Open Educational Resources: OpenLearn scenarios

In order for OpenLearn to continue its activities, it needs to search for an adequate sustainability model. Sustainability in OpenLearn includes more than the idea of longevity: it is seen as the ability of the project to continue its operations, and to meet its targets. OpenLearn received a US \$ 8.9 million grant from the William and Flora Hewlett Foundation to support its operations, during the

first two years of the program (2006-2007). The Open University itself contributed with over US \$ 1 million towards OpenLearn, so far. Sustainability, then, is at the heart of any OER initiative: although the user has free access to the content, there are costs involved in their production. These costs need to be met by someone in the process.

Funding models

OER initiatives must have some sort of funding model. Here we highlight three of the most common ones: external funding, institutional funding, and government funding.

The model of external funding is perhaps the most popular one within the various OpenCourseWare initiatives, so far. But it is a model that demands securing funding in advance, for the purposes of budgeting, and future planning. But this is not always possible. For example, in the case of OpenLearn, the funding was agreed on a two-year basis, starting from the first quarter of 2006. The OpenLearn Team, at the moment of writing this paper, is looking for alternative ways to funding, for the next stage of the initiative. In the case of OpenLearn, it is actually a mixed-mode funding, because the Open University itself has put a considerable amount of money towards the initiative. Some say that external funding is not always the most appropriate option, in an institutional perspective. This is because the staff might feel divided between meeting the targets of the institution, and the ones of the sponsor, when (and if) they happen to be slightly different. Some also say that external funding, therefore, can dislocate the efforts of the staff, and somehow detach the work of the project from the work of the rest of the University. But it is not to deny that, overall, external funding is a good way to kick off an initiative, and to evaluate its feasibility.

The second model is the institutional funding. This is when an institution embraces completely the OER initiative, and its costs. There might be some expectancy of revenue out of this model, though; via students' recruitment, sales of books or other course materials; or even, in an ideal scenario, from tailored tuition or other services (which could include certification, for example). At the Open University, this model is under study. The University considers embedding OpenLearn into its core activities. This would mean that changes in the institutional culture, and perhaps

in the business model, would have to take place. In terms of the institutional culture, the faculties (and faculty members) would have to consider OpenLearn from the conception of a course. For every course, a faculty writes, a considerable section of it (or maybe the whole course, if the sustainability model for OpenLearn considers providing certification, at a given cost) would have to be made available in OpenLearn. At the moment, it is at the faculty discretion what courses to offer in OpenLearn, how much of it, and whether they want to offer it at all. In terms of the business model, the example above, about certification provision, suits well. Suppose the University decides to provide certification, at a cost. A self-learner would then be able to study the course for free in OpenLearn, and would have a range of services to choose from: personal tuition, group tuition, aggregated materials (such as video lectures, for example). And then, they would have to pay to take an exam, and for the costs of a diploma. This model would change the ways in which the University provides its courses, but it would still certainly be in line with the Open University mission: to widening participation to higher education by lowering down the barriers to access.

The last model we develop in this paper is the government funding one. In this model, the University would consider seeking for funding from national funding bodies, such as JISC (Joint Information Systems Committee) or other funding councils. This would make OpenLearn much more of a national venture, rather than a global one. This is because with the investment of local government money, it is expected that the OpenLearn activities would target the British audience. One of the possible ways in which OpenLearn could work, in such a scenario, would be to be a source of curriculum, of content to other UK higher education institutions.

However, OpenLearn is taking a careful approach on the choice of its next funding model, and it might be the case that the best approach is to continue to have a mixed-mode one. OpenLearn is currently located in a mixed-mode approach, because it counts on funds from its sponsor, and from the University.

Action Research in OpenLearn

OpenLearn was designed as an experiment to help the Open University and the world understand the possibilities and impact of OERs. Alongside investment in the technology and content, the initiative supports a research and evaluation team, that is working on understanding the data from the system, carrying out studies, establishing collaborations, and feeding back into the development process. Beyond this team, the whole initiative is envisioned as 'Action Research', as we try things out, and monitor what we do. Action Research is seen as an iterative process, involving researchers and practitioners, reflecting and acting upon research findings (Avison et al., 1999). Our Action Research involves everyone connected to OpenLearn, as they generate new ways to work with the original material, and develop insight into the possibilities for working in new media, and with new tools. Our users also form part of this research process, through their feedback and actions on the site, and in addition they can become involved, within the LabSpace, in more experimental aspects of the work. For example, in OpenLearn, we are offering access to our materials, so that they can be reworked by users, and that we have several technical options for how this can be supported. We need the feedback of our users to find out if we are providing usable and useful routes for this to happen, and so have offered increased access rights, for those who are interested in trying to experiment with our early releases.

Action Research, as a methodology, encourages the use of reflective practice (Somekh, 2006), sees the process as a way to achieve professional development and empowerment, for those involved in the initiative. It is particularly valuable, as a way to bring in the tacit knowledge from those inside the project, and those who are acting on related work in the University. It is hoped that, using this method, along with other analytic approaches to the data we gather, will help the initiative influence institutional and community change. Action Research is applied, along with other approaches, to the analysis of the quantitative and qualitative data that we are gathering from the use of the system, and studies that consider future opportunities, and learn from other work in the area.

Conclusion

In this paper, we emphasized OERs as an innovation, able to bring new opportunities for learning and distance education, in the third millennium. They are public goods, that can be used to promote educational inclusion. The provision of open educational materials for free on the Web, in a form that can be reused and remixed, for various purposes, opens up for a new model of joint construction of knowledge, enabled by participatory Web systems. In this scenario, OpenLearn is an Open Educational Resources initiative, that particularly illustrates the innovation in learning that is taking place, and has the potential to change the way people learn. OpenLearn offers content, alongside other free tools, such as discussion forums, chat and presence maps, videoconference, and knowledge mapping software, aiming to enhance the learning experience.

Social learning is at the heart of OpenLearn. The content and tools available in OpenLearn make the experience of studying at a distance more engaging for a self-learner. The technology provided allows for the independent creation of learning communities. Discussion forums, for example, support this social learning view across the Website, where it is possible to find examples of learning tasks, completed by learners, and examples of discussions, about the relevance of topics, and on how to create groups of interest.

The challenge in the provision of Open Educational Resources is to find a sustainable business model. OpenLearn, at present, has a mixed-mode approach, mostly supported by external funding, but also counting on funds coming from the University itself. Different funding models are under study, and will take place in the near future.

On a research point of view, OpenLearn provides the setting for a rich and enlightening study on how people learn by using open learning systems on the Web; and also opens up for an investigation of various other aspects, such as cross-cultural issues, sustainability, tools, and widening participation in education. OpenLearn is an Action Research initiative, which involves practice, research, and reflection. It is a challenging project, but very exciting for the provider, and for the learner.

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Sintesi

Le OER, Open Educational Resources, rappresentano opportunità innovative per la formazione a distanza. Solitamente erogate in forma di corsi, comprendono anche unità didattiche concentrate, le cui componenti audio-video-testuali vengono messe in rete, ad accesso libero, con licenza Creative Commons. Eliminando i consueti vincoli dell'istruzione tradizionale, l'apprendimento a distanza basato sulle OER offre la possibilità di estendere la partecipazione all'istruzione a gruppi critici, per i quali l'accesso alla formazione risulta difficile o impossibile.

A tal proposito, la Open University UK ha lanciato OpenLearn, un sito Web basato sulle OER, che consente all'utente di navigare attraverso una selezione di unità di materiale didattico, progettato in modo da coprire tutte le aree disciplinari. I contenuti, pur restando al centro delle iniziative OER, non esauriscono l'intera esperienza d'apprendimento. Le OER forniscono infatti anche strumenti supplementari: il modello di Supported Open Learning della Open University UK contempla anche assessment del tutor, tenendo però separati i due aspetti del materiale e del supporto umano.

OpenLearn permette il cosiddetto social learning, un apprendimento di tipo sociale, con l'interazione dei discenti, mediante Flashmeeting, forum di discussione, learning journals, un instant message system (MSG) e il Compendium, un software per realizzare una mappatura di sintesi della conoscenza, tutti strumenti tecnologici che consentono una pedagogia partecipativa per lo studio nel Web. Per analizzarne la rispettiva affordance nel supportare l'open learning, si discute in particolare dei forum di discussione open, delle MSG chat/MSG presence map e dei learning journals.

Il sito Web OpenLearn è costituito da due ambienti distinti: LearningSpace e LabSpace. In particolare, LearningSpace è un ambiente d'apprendimento di tipo

open, costruito automaticamente, con contenuti descritti in XML, che girano all'interno di Moodle, piattaforma didattica open source. Ampio materiale, caratterizzato da uno stato di elaborazione minore, è invece collocato in LabSpace, proprio per enfatizzarne la natura maggiormente sperimentale. In teoria, LabSpace è pensato per gli educatori, che possono riutilizzarne il materiale, sia operando delle selezioni al suo interno, sia modificandolo, tramite la funzione di editing, e poi linkandolo a contenuti più recenti; di fatto, però, questi materiali meno elaborati e più sperimentali possono essere consultati e aggiornati anche dagli stessi discenti. Nel 90% dei casi, i corsi di formazione a distanza affiancano al consueto self-study di testi elementi di supporto critico, incorporati da OpenLearn per vivacizzare lo studio autodidatta: suggerimenti, inviti alla riflessione, domande, oltre 200 videoclip, un centinaio di interazioni di altro tipo e filmati supplementari in Flash. Nel corso di un biennio, il sito intende erogare 5.400 ore di unità didattiche, per la maggior parte recuperate da corsi pre-esistenti della Open University UK. Questi materiali vengono modificati seguendo tre alternative: selezionandoli da corsi completi, come attività indipendenti più brevi, di 3-20 ore (rispetto a corsi di 100-600 ore); presentandoli interamente online (senza l'ausilio della consueta guida a stampa); sostituendo l'apporto e l'assessment del tutor, con strumenti di supporto e di verifica elettronici a scelta.

Oltre alle modifiche al formato e alla struttura, alcuni contenuti di OpenLearn ricevono anche un trattamento supplementare, teso a evidenziare elementi interattivi oppure a rielaborare il materiale in funzione sperimentale, testando così le varie opportunità disponibili nel passaggio dal cartaceo a una piattaforma online.

La gratuità dei contenuti pone, tuttavia, dei problemi di sostenibilità economica. Le iniziative legate alle OER in generale e OpenLearn in particolare necessitano di modelli di finanziamento adeguati per proseguire le attività. Mentre soluzioni sono in fase di studio, in mancanza di un finanziamento statale, OpenLearn utilizza attualmente un approccio misto, basato sul finanziamento esterno e su quello istituzionale. Per il 2006-2007, a sostegno dei primi due anni del programma, il sito ha potuto contare sia sul proprio sponsor, la Fondazione William & Flora Hewlett, sia sulla Open University UK stessa. Nato come esperimento volto a comprendere meglio, sia a livello locale che globale, le potenzialità e l'impatto delle OER, accanto all'investimento nella tecnologia e nei contenuti, l'iniziativa OpenLearn supporta un'équipe di ricerca e valutazione, che lavora alla comprensione dei dati del sistema, portando avanti studi, stabilendo collaborazioni e ricevendo feedback dai discenti nel processo di sviluppo. Tale approccio si inserisce in un più ampio modello di ricerca, l'Action Research, che incoraggia appunto l'utilizzo della pratica riflessiva, allo scopo di raggiungere un alto grado di empowerment per un massimo livello di sviluppo professionale.