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OPEN EDUCATIONAL RESOURCES OPEN CONTENT FOR HIGHER EDUCATION

Final report of the discussion on Free and Open Source Software (FOSS) for Open Educational Resources

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INTRODUCTION

During October 2006, the UNESCO International Institute for Educational Planning's (IIEP) two international Communities of Interest, on Free and Open Source Software (FOSS) for education and Open Educational Resources (OER), were brought together to address the topic of FOSS solutions and lessons of the FOSS movement for OER. The joint forum was informed by the conclusions and recommendations of an earlier discussion session in the FOSS Community. A background document – the report of the FOSS Community discussion[1] – was distributed to the joint FOSS-OER group and, over the following two weeks, forum participants contributed to a stimulating discussion on the relationship between FOSS and OER.

The premise of the deliberations was that FOSS and OER share a common conviction that access to resources, whether software code or learning materials, should be free and open for use, modification and sharing. It was also hoped that the more mature FOSS movement would have valuable lessons to pass onto the newly developing field of OER. The participants engaged in a rich exchange of ideas that produced several important conversation threads, which the present document synthesizes under the following headings:

- Comparable demands of development
- Development models
- Learning design standards
- Mechanisms for quality assurance
- Consideration of licensing choices
- OER and certification of competencies
- Levels of expertise and motivation to learn
- The role of new generations of participants
- Learner-centred OER
- Print publication of OER

[1] Available at http://www.unesco.org/iiep/virtualuniversity/forumsfiche.php?queryforumspages_id=30.

COMPARABLE DEMANDS OF DEVELOPMENT

During the earlier FOSS forum it was suggested that OER content management presents fewer technical demands than FOSS development. Responding to this in the joint discussion, some participants disagreed and argued that, although the demands of educational resource development are of a different nature to that of FOSS, they are nevertheless comparable in their degree of complexity. Instructional design issues and production standards, such as adherence to learning design specifications, high levels of granularity,[2] and separation of content from presentation, present challenges that are equally demanding from the development perspective.

In fact, as OER practice is still in its infancy, it is likely that many of the finer points are not yet fully understood by practitioners. In this respect, OER development may be a more difficult undertaking than the now well-established path taken by FOSS developers. However, comparisons between the two movements have little practical use if conceived only in terms of the demands placed on their respective practitioners. It may be more helpful to examine the qualitative differences in the nature of each practice.

> "I'm not sure it's necessary to determine whether things are 'easier' or 'harder' in the FLOSS [Free/Libre Open Source Software] or OER worlds, but as the previous messages illustrate, there are differences, and understanding those differences will be important to applying lessons learned in the FLOSS community to OER. […] In OER more significantly than in FLOSS, the production and distribution aspects of open sharing can be disaggregated. Typically in a FLOSS project production and distribution are tightly intertwined. The open distribution is what supports iterations (and thus production) by a wide community. There are certainly great examples of this happening in OER as well – Connexions comes to mind – but open sharing and open production need not necessarily occur together in OER."

DEVELOPMENT MODELS

> "At the end of this forum, it may be beneficial if the forum summary included an outline of different development models for open-source educational resources and comments (benefits, challenges, situations suitable for the approach, etc.) with each model. This information could be based on the various discussions that have taken place during this forum. Forum participants may want to add to this summary by identifying projects that use a specific approach so that those contemplating a project will have a person or organization they could contact for additional information."

Although the forum did not result in the resource proposed above, mostly due to the short time available and the number of topics discussed, the joint community did identify two major approaches to OER development, termed 'cathedral' and 'bazaar.'

- A 'cathedral' model for OER development involves a highly organized, top-down structure that may require paid teams of experts to lead the development. OER projects such as MIT OpenCourseware (http://ocw.mit.edu/index.html) and Open University OpenLearn (http://openlearn.open.ac.uk/) are some of the examples of this approach.

[2] Granularity refers to the size of educational resource: the more granular a resource, the smaller the chunk of information that it contains. For example, a single learning object, such as a graphic, is more granular than a complete course presented in a format that prevents its being broken down into its composite elements.

- In contrast, in a 'bazaar' model, a basic FOSS architecture and tools are made available to potential OER developers with the expectation that the development will be driven by need and facilitated by support from the emergent community. Rice University's Connexions project (http://cnx.org) is one example of a grassroots approach such as this.

In reality, it seems that most projects fall somewhere in-between these two models, with institutional structures and staff in place to support development efforts, and plenty of room for spontaneous growth as a function of dedicated and innovative content developers.

LEARNING DESIGN STANDARDS

The open nature of educational resources that are intended for modification and reuse stands in apparent conflict with the issue of standards for learning design. For this reason the emphasis on pedagogical neutrality and flexibility of standards, such as that advocated by IMS, is noteworthy. IMS Learning Design (http://www.imsglobal.org/learningdesign/) includes a set of specifications for describing the elements (including resources) and structure of any unit of learning. In fact, an awareness of standards is very important for OER developers, since they facilitate the transfer and reuse of educational resources across different systems.

Both the FOSS and OER communities recognized the importance of such efforts and raised the question of implementation of design standards for OER. The Learning Activity Management System (LAMS, http://www.lamsinternational.com/) was singled out as a promising FOSS solution that allows for standardized development of collaborative learning activities. Its functionality and value to OER can further be extended through direct integration with Moodle (http://moodle.org/), a popular FOSS course management system.

> "Pedagogic neutrality – as highlighted in IMS Learning Designs – is very much a necessity especially in the context of the changing perspectives on learning. In a teacher centric mode of schooling – as the model of Education – even if an individual teacher tries to go beyond the given framework he or she is expected to then fall in line with yet another defined line of thinking – a beaten path. […] LAMS seems to be a powerful and exciting tool especially for the teachers and facilitators of learning."

MECHANISMS FOR QUALITY ASSURANCE

Quality assurance in OER is a complex issue, and it is no surprise that it remains outstanding following the FOSS and OER communities' discussion. FOSS developers can rely largely on technical operability as proof of the quality of their product. Educational content, however, can often be used in spite of any faults that it may have, such as inaccurate information or dubious pedagogical value. It is hoped that the dynamics of peer review and collaboration could contribute to assuring the quality of OER content. In this respect, higher levels of participation by all stakeholders, from learners, to educators to administrators, are considered an important mechanism for quality assurance and an important lesson to be taken from the FOSS movement. At the same time, the group cautioned against efforts to regulate the quality of OER too strictly. It was feared that over-regulation and setting the quality bar too high could potentially reduce levels of participation, thereby effectively minimizing one of the mechanisms for quality assurance.

Those who support the self-regulation of OER took a different view on the issue of quality. They argued that quality resources should eventually rise to the surface of the OER pool as a function of the global recognition of their educational value and as a result of their continued use, adaptation and modification. The question of quality assurance in this pragmatic model of OER development is therefore less of a primary concern: high quality resources will be those that withstand the test of time.

It should be noted that both of these approaches assume a central role for the users of OER, who improve the quality of resources through the process of selecting, adapting and contributing them back to the global community:

> "I agree quality is a strategic priority for those of us grappling with the promotion and sustainability of OERs. An interesting thought – I would far prefer access to a poor quality free resource, which I have the freedom to modify and improve for the benefit of my community than for example, a high quality PDF file that's locked down with a NC [Noncommercial] restriction!"

CONSIDERATION OF LICENSING CHOICES

The previous quote illustrates the strong emphasis that the joint FOSS-OER group placed on the critical importance of open content licenses, as well as their practical relevance to other aspects of OER, such as quality assurance. Licensing was also singled out as one of the areas where the newer practice of OER can learn the most from the experience of the FOSS movement.

> "Our students (and faculty) can now find a vast array of information (both high and not-so-high) quality on the web. But they cannot re-use most of these resources without getting permission from the author. Most faculty will not go through the effort to do this. While it doesn't solve all the problems, having an appropriate CC [Creative Commons] license on most content would go a long way towards encouraging the development/improvement of content."

Developers of OER content need to carefully consider licensing options and their implications, including those offered under Creative Commons (http://creativecommons.org/). It is through licensing choices that the future success of open content distribution, sharing and modification is determined. As some advocates have argued, selection of a particular license clearly demonstrates the content distributor's commitment to the fundamental 'open' principles of the FOSS and OER movements. Not all license options equally support the notions of free and open content, such as is the case with the 'No Derivative Works' and 'Noncommercial' restrictions available from Creative Commons.

OER AND CERTIFICATION OF COMPETENCIES

Once content has been developed via FOSS tools, structured according to learning design standards, peer-reviewed to ensure quality, and made open for further improvement with an appropriate license, stakeholders may begin to question whether OER should be used for accreditation of learning. This issue produced a heated debate in the forum, with the outcome being a clear distinction between certification of competencies and certification of content.

Certification of competencies is an area of growing interest, particularly in the domain of information technology. There are efforts to provide FOSS-based programmes in response to some of the leading commercial initiatives, such as the European Computer Driving License (http://www.ecdl.com/). Such programmes provide certification of basic computer skills and software application specialization, and are seen as a promising alternative for poorly resourced areas. OER can be used to provide the content for training and testing and may therefore be considered an integral part of the certification of competencies based on FOSS.

In contrast, on the issue of certification of content, the consensus was that such efforts would be not only difficult to accomplish, but highly ambiguous in principle. Participants argued that fluidity is a fundamental property of OER content, subject as it is to continuing adaptation and modification. This fluidity makes certification of content impossible in practice. Furthermore, certification was criticised

as a bureaucratic practice that demonstrates no more than temporary familiarity with the specific requirements of the test taken, rather than any lasting knowledge or competencies. Taken further, it was argued that OER content should not be designed specifically for measuring business-centred competencies based on a limited set of skills.

However, some participants presented examples of circumstances that do bring the issue of content certification to the forefront:

> "In our OER project we are developing courseware and assessments specifically designed for the New Zealand curriculum. There is a quality assurance process to ensure suitability so in that sense it is certified content. […] The original material is 'certified' which addresses return on Investment issues with the funding body and our business need."
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> "In some contexts the issue of accreditation of OERs will arise. For example, several African universities will be making use of resources that have been either co-developed (among themselves) or adapted from existing OER collections for use in their formal academic programs. In cases like these, the university accreditation bodies will need to accredit the programs (as they do any other)."

In conclusion, the importance of the accreditation of programmes, rather than the resources themselves, was considered key to the resolution of the discussion on certification. It was also recognized that accreditation procedures are the domain of institutions. This suggests a possible issue for future discussion: the determination of institutional policies on the certification of OER-based education programmes.

LEVELS OF EXPERTISE AND MOTIVATION TO LEARN

Development of educational resources in the form of digital learning materials requires a certain degree of technical skill and familiarity with the various FOSS tools available. Often, an underlying assumption in the recommendations made for OER practitioners by FOSS advocates is the existence of adequate levels of technical expertise. However, for many potential content producers this may not be the case:

> "Sometimes, working in the e-learning field, we can forget that many people have no knowledge of these tools and what use they might be for researchers and project development. We also forget that installing software – even modern, easy to use, web software, lies outside the experience of many users."

FOSS producers focus on software as the end goal of their work, while in OER content development software is a tool only. Clearly, the levels of technical demand in these two cases are very different.

One of the conclusions of the debate in the FOSS Community was the complementary nature of the relationship between the two movements. Some participants in the joint debate, however, expressed concern over their capacity to contribute to and benefit from such a relationship. It was suggested that potential OER developers should place themselves on an 'expertise continuum' and then seek the appropriate levels of technical training and support. There were, however, others that argued that technical familiarity could and would be acquired as part of the process of OER production, rather than through formal professional development. From this perspective, the issue is less about acquiring skills and more about motivation for continuous professional development and learning. Here the group stressed the need to uncover the motivational factors that contribute to the progress and success of long-running FOSS projects and initiatives.

THE ROLE OF NEW GENERATIONS OF PARTICIPANTS

Related to this issue of motivational dynamics was the observation that younger people, with their enthusiasm and capacity for innovation, are often the driving force behind many FOSS projects. The communities and groups that form around FOSS initiatives often appear to be largely composed of young people. In contrast to traditionally more experienced commercial software (or educational content) developers, these developer/user groups contribute collectively to the progress of the project through testing, feedback and code modifications. Clearly, such communities change the nature of project development in FOSS by shifting from individual professional expertise to a community's pooled knowledge and contributions.

The joint FOSS-OER group questioned whether and how the same generation of participants could be attracted and recruited for OER participation:

> "How welcome do we make most young learners (formal and informal) to participate in our current OER processes, especially as improvers/creators of learning material?"

These learners, aptly referred to as 'digital natives', show tremendous skill in both using and creating with technology. If their abilities are not utilized as part of the OER community's efforts to take advantage of digital resources for education, new generations of learners could be further alienated from formal education. Greater involvement of young learners in the production of OER could have an additional benefit: it was suggested that the FOSS and OER approach to content and software licensing could reduce levels of piracy and help to legitimize peer-to-peer sharing and distribution.

While the group acknowledged the potential that young participants can bring to new directions in technology-supported education, it also stressed the importance of lifelong learning and warned against discriminating against older generations.

> "I would like to add that age should not be a hindering factor in the concept of learning communities and it has not been the experience. Just a month ago, the Indian State of Kerala (my home state) completed a project of introducing computers to the elderly women from the rural – agricultural farming – areas. These new learners – mostly above 60 years – were not even literate in English. All of them were positive and were of the view that the training inputs will be useful to them."

LEARNER-CENTERED OER

In line with current pedagogical thinking, OER developers need to place the learner at the centre of the educational process. It was argued that old didactic teaching practices do not work in the new digital age, with its increasing variety of media available to stimulate creativity and engagement. Instead, constructivist approaches to learning better reflect a reality of knowledge construction through the engagement between novices and more experienced users in communities of practice.

In terms of OER development, this approach means that learners themselves need to be given opportunities to contribute to learning resources. While the teacher was recognised as an important facilitator of this process who, by virtue of their professional experience, can provide scaffolding and guidance, the students should play a key role in shaping classroom materials and learning resources. It was expected that the value of OER would increase through genuine student use and modification. The FOSS movement may contribute to this process of real-world OER validation by providing tools for student expression.

"Yes there is always a role for lectures and seminars and teachers have an important role in supporting learning. But the focus should be on tools for learners – not just platforms for teaching – to express themselves in whatever media they feel comfortable in – including blogs and wikis, podcasts and videos – and to collaborate and share their stories."

PRINT PUBLICATION OF OER

The educational publishing industry is another domain in which the OER and FOSS movements can facilitate a change in established practices. Strong arguments were made in favour of developing and using Creative Commons-licensed learning materials as an alternative to commercial textbooks, which are becoming less and less affordable even to learners in developed countries. In addition to the financial advantages to the learner, so-called 'open' textbooks allow teachers the freedom to customize the materials to better fit their own course designs and teaching situations. This is another aspect that resonates with the constructivist pedagogy mentioned in the previous section. In contrast to the course coverage being determined by, and following, fixed and segmented subject matter in a commercial textbook, the open textbook can be continuously modified to accommodate changing classroom and learner dynamics.

At the same time, it was recognized that such a change would face great political opposition from the publishing industry. Strong advocates will be needed. However, it is hoped that educational publishers realise the necessity for change as traditional textbooks lose their formerly privileged position as the keys to factual information. Web-based projects, such as Rice University's on-demand academic publishing initiative, delivered through Connexions,[3] may be in their early days but are gaining much publicity.

"FLOSS and open content movement are slightly shaking the boat of the educational publisher. There is a real fear that the role of the publisher in the value chain will change. It looks that what is left for the publishers is the editorial work and marketing, as the actual content creation and distribution will be done online."

GENERAL CONCLUSIONS

The joint FOSS and OER group addressed a number of issues by drawing upon the experiences of the FOSS movement and examining their relevance and value for emerging OER practice. From these deliberations, some general conclusions can be made in the form of lessons learned from FOSS and best practice for OER development:

- Development structure is characterised by both top-down and grassroots approaches, each with unique roles: the former contributing institutional support and infrastructure, the latter providing the impetus for creative growth and progress through innovation.
- Communities are hubs for project sustainability and collaboration, driven by enthusiasm from novices and the knowledge and maturity of more experienced members.
- Project development is meticulously documented and quality is ensured through modular peer-review, facilitated by the granularity of content.
- Standards exist not to proscribe development, but to ensure interoperability and exchange.

[3] See http://www.media.rice.edu/media/NewsBot.asp?MODE=VIEW&ID=8672&SnID=90828 for more information and http://cnx.org/content/col10376/latest for the first book delivered through the service.

- Innovation is a response to a need, a personal “itch” that transforms into a collective undertaking.
- Licensing choices ensure commitment to the principles of openness and freedom of knowledge and resources.

While the OER movement will certainly face unique challenges in the future, the knowledge and experience shared by FOSS practitioners is of undisputable value. The joint FOSS-OER group discussion, organized by IIEP, produced a number of important conclusions as outlined above, covering most aspects of OER practice, from content development and learning standards, to the questions of quality and expertise through community participation. It is hoped that the FOSS and OER movements will closely collaborate to make education more accessible worldwide, through utilizing the potential of existing and developing technologies. By bringing together hundreds of professionals from around the world to deliberate on issues of importance to both movements, this Internet discussion forum was a strong affirmation of this conviction.