

GÉANT Association NRENs and Open Education

NREN Community Statement on Open Education

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Executive Summary

This position paper has been prepared by the NRENs (National Research and Education Networks) participating in the GÉANT Association (see www.geant.org) European research and education networking collaboration.

Many of the European NRENs are active in Open Education activities and have made a significant contribution to the deployment and availability of OE digital technology and content. The NRENs would like to offer their knowledge and expertise to progress the objectives of the EC's Open Education policy.

The focus in Open Education Resources continues to be largely on increasing access to digital content in the form of repositories and infrastructures. To encourage the wider take-up and use of Open Education Resources, more consideration needs to be given to how technology can support educational institutions in offering Open Education facilities in a financially sustainable manner, and to developing methods and practices which enable learners, teachers and institutions to best engage with OER.

The NRENs are well-qualified to contribute to these next steps, in collaboration with the EC, educational institutions and other relevant players. Beyond providing and supporting the technology that delivers OER/MOOCs to users, NRENs wish to engage with educators and participate in the production of openly licenced content (course development) especially in the area of ICT and networking, for the benefit of teachers and the next generation of the knowledge economy. In return, educators should encourage students by creating appropriate policies (e.g. participate in flipped classes, use Creative Common licences) to better use the NREN services directly or indirectly offered to them.

Europe's NRENs, within their GÉANT collaboration, propose to develop a pilot European Open Educational Resource portal service, which will prototype a one-stop-shop (broker) for national learning resource organisations. The portal will enable structured searching and re-use of content on a European level. The initiative is complementary to the European Commission's Open Education Europa portal and, once developed to an appropriate level, can be made accessible via that portal.

The NRENs and GÉANT are also pioneers in developing access federations and state-of-the-art authentication and authorisation infrastructures (AAI). AAI has a significant role to play in supporting the development of sustainable Open Education in Europe. The NREN community is keen to engage with the EC in developing its Open Education policy to take greater account of the potential of AAI, and in continuing to work with the education community to deliver the benefits of AAI.

The European NREN community is in a good position to facilitate how Open Education Resources can be findable and accessible, more effective in helping students, serving minority populations, improving the teaching and learning process and potentially lowering the cost of higher and adult education.

The European NRENs support the EC's policy of EU-level cooperation to push reforms towards the adoption of open learning, and is ready to engage in discussion and activity aimed at realising reform.

1. Introduction

This position paper has been prepared in order to demonstrate the transformation taking place in global higher education systems driven by the combined impact of applied Information and Communication Technology (ICT) and Open Education (OE) movements, and to demonstrate how National Research and Education Networking organizations (NRENs) in Europe are engaging with and influencing this change. The constructive role of NRENs and the GÉANT collaboration is illustrated via various national and international use cases and programmes.

The GÉANT network is the pan-European research and education network that interconnects Europe's NRENs. The network and associated services comprise the GN3plus project, a collaboration of 38 European NRENs, DANTE, TERENA¹ and NORDUnet (representing the 5 Nordic countries). GN3plus is co-funded by the European Commission under the EU's 7th Research and Development Framework Programme. Together, the GÉANT and NREN networks deliver data communications infrastructure to 50 million research and education users at 10,000 research and education institutions, in 43 countries across Europe.

2. ICT and Open Education – Opportunities and Challenges

Open Education is motivated by a belief that learners desire to exercise freedom in their studies, to take responsibility for their educational decisions and to have personal choice in the focus of their classroom studies. Open Education movements are dated back to the beginning of the twentieth century and the first Open University was established in 1969 in the United Kingdom, primarily for those wishing to pursue higher education on a part-time and/or distance learning basis.

The ability to share resources on the web at little cost compared to the distribution of hard copies facilitated the re-birth of the traditional Open Education movements. One of the first examples of this is the OpenCourseWare program, which was established in 2002 by Massachusetts Institute of Technology (MIT) and is followed by more than 200 Universities and organizations. “Giving away knowledge for free” (OECD 2007) seemed like a revolutionary idea: it fascinates educators, interests learners, scares publishing houses and challenges educational organisations who view selling produced knowledge as their core-business. Open Educational Resources (OER) as a term was first used by UNESCO in 2002, since when the concept has spread widely. Today, OER are a widespread reality, they are produced, shared, used and re-used by educators and learners and often accessible through large databases [1].

The sustainability of a nation in the new ICT-driven era of knowledge economy depends on an effective educational system. The proper integration of ICT with the teaching/learning environment increases education, the quality of education and eventually economic productivity. Many institutions are

¹ TERENA and DANTE have restructured, forming the GÉANT Association on 7 October 2014.

incorporating ICT into their management, administration and educational programmes in order to serve their students both with higher quality and more cost-effectively and to prepare them for the world into which they will graduate. In many developing countries, however, access to hardware, software and connectivity remain challenges. It is therefore critical to adapt pedagogical approaches and learning materials to this environment while ensuring high quality and relevant educational opportunities [2].

The OER movement has been successful in promoting the idea that knowledge is a public good, creating incentive for organisations and individuals to publish OER. However, the potential of OER to transform educational practice has not yet been fully realised. The current focus in OER is still mainly on increasing access to digital content in the form of repositories and infrastructures whereas there is little consideration of whether the technology will support educational practices, open education, or promote quality and innovation in teaching and learning. The methods and practices that enable learners, teachers and institutions to best engage with OER are not yet established and may well be more important in enabling change in education systems than the availability of the resources themselves. There is clearly a need for innovative forms of support for the creation and evaluation of OER [3]. This paper demonstrates that NRENs are in good position to facilitate this.

MOOC is a more recent form of online course development getting more attention since the autumn of 2011 which was followed by a number of non-certificate-granting programs, including edX, Coursera and Udacity mostly in the United States. The early European MOOC activities are mainly concentrated in Western Europe, serve a limited number of language communities, and have mainly been driven by individual ambitious players from the higher education sector. Although European higher education institutions (HEIs) are aware that MOOCs are an important global movement and an instrument for educational policy, many have been hesitant to adopt or engage with MOOCs. Pedagogical issues, strategic and cost questions are among the concerns that have prevented or delayed many European HEIs from entering into this movement, and the consequence is a hindrance to timely European development in this area [4].

Our belief is that the well-established NREN collaboration in Europe is the gateway to bridge the open education digital divide concerning the penetration of European OER and MOOCs as well as to get over the technical, cultural and language barriers – especially the dominance of the English language – by demonstrating efficient knowledge sharing and multilingual diversity.

The following three chapters illustrate what should happen next and how NRENs can engage and actively contribute to help the OE industry develop in the right direction in Europe.

- Instead of competing with the commercial or large community based software development market, NRENs can better focus on application development and service integration for the benefit of the research and education sector that they know very well. Connecting the yet scattered landscape of the European institutional and national multimedia content repositories using standard metadata schemas and harvesting protocols is one of the interest areas of the GÉANT NRENs.

- NRENs are in the forefront of the development and deployment of federated Authentication and Authorization Infrastructures (AAI) around the globe. State-of-the-art AAI is key to realising the full development of Open Education.
- The digital divide concerning the European education sector cannot be efficiently bridged without the engagement of the best technical experts – many of whom work for the NRENs – in teaching and learning processes. NRENs are well positioned to contribute to traditional and online (such as MOOCs) course development especially in the area of ICT and networking.

3. From Toys to Tools – Technology and Services

The European NRENs first gathered under the TERENA Task Force on Media Management and Distribution (aka. TF-Media) [5] in 2009 in order to coordinate their actions and to share ideas, knowledge, and experiences about the technical and legal aspects of federated, multimedia production, management and distribution systems and services. Representatives from 10 NRENs and more than 30 universities and other institutions held 15 meetings and gave almost 100 presentations during the four-year mandate of TF-Media.

By the end of 2011, it became clear that the participating NRENs are in a good position to survey and analyse – in some cases develop, enhance and maintain – the special requirements of academic and research communities’ changing multimedia needs. These needs are reconfiguring around the concept of co-production and re-use as opposed to the old broadcast (i.e. produce and deliver) model. The first TF-Media survey results (2012) showed the rapid expansion of lecture capture across Europe and the widespread use of cost-effective open-source software tools. More than 70% of the NRENs who responded to the survey had some kind of multimedia-related services in place and the average recorded lecture/conference hours reached 170 hours or more on a monthly basis. One third of the respondents had more than 5 TB of archived content available [5].

The various software tools that were rather toys in the beginning gradually became real production-grade software with sustainable support. These tools were developed and offered by:

- HEI consortia (such as the Opencast Matterhorn Community),
- NREN initiatives (such as SURFnet’s MediaMosa Foundation) or
- commercial companies (for instance, Kaltura).

The common attribute of these tools is that they are all widely available open-source platforms to support the capture and management of educational audio and video content. However, the “building of own” versus “buying off-the-shelf” remained a constant debate within the community. Therefore, in 2012, TF-Media changed its main focus from coordinating the development of software and technology towards supporting of multimedia applied to pedagogical (e-learning/teaching) and research/scientific purposes.

While it is a fact that millions of learning objects and OER can be found on the Internet using search engines like Google, there is no guarantee that a query will lead to trustable, openly licenced material on which high quality open education can be built. Well managed OER repositories that aggregate high quality content offer a solution to this problem.

In the end of 2013, TF-Media initiated a spin-off pilot project called: TERENA OER [6]. Unlike institutional or contextual OER repositories (such as the MIT OpenCourseWare, MERLOT, OER Africa or MAOR), the TERENA OER follows the metadata aggregation principle and the federated model of various content repositories and referatories (similar to GLOBE, OER Commons, Europeana or Open Discovery Space). The primary aim of this project is to develop the first working prototype of an Open Educational Resource portal service by developing a scalable metadata aggregation engine and a web portal front-end demonstrator. The objective is to pilot this service for the broader GÉANT Community at the beginning of 2015 in order to:

- facilitate connection of the scattered institutional/national OERs and unlock the deep-web (i.e. not indexed by standard search engines) by enabling structured searching and reuse of content; and
- prototype a one-stop-shop (broker) for national learning resource organisations, each of them managing and/or federating one or more learning object repositories within the country.

Eventually, GÉANT will be able to make a suite of online services and tools available to its partners for the exchange of learning resources, and facilitate access to the worldwide open education community (i.e. GLOBE or EC Open Education Europa) guided by the following principles:

- Keep the barrier of entry to GÉANT OER low and participation high.
- Provide open specifications and community source code as much as possible, openly shared among and beyond community members.
- Use open standards, where appropriate, and contribute further to the development of these standards based on experiences and best practices.
- Respect and build on European values and operate as a community of peers.

The TERENA OER pilot is leveraging the outcome of the previous open-source projects ARIADNE and PuMuKit. The core pilot group includes the following contributors: IUCC, GRNET, FCT/FCCN, RedIRIS, SWITCH, NIIF, University of Vigo, ISEP, UPMC, UPV, Kaunas University and Tel Aviv University [6].

4. Open vs. Accessible – Supporting the Key Principle

The definition and interpretation of the term “open” has been slightly changed since the first Open Education movements and Open Universities appeared. Today, many scientific publications are questioning the openness of MOOC (e.g., MOOCs: One Step Forward, Two Steps Back for Open Education [7]).

- In 1969, The Open University in the UK defined openness as “open entry”; the university policy that essentially allows anyone to enrol in courses regardless of their prior academic achievements.
- In 2002, OpenCourseWare at the MIT defined openness as “open license”; the open license that provides individuals and organisations with a broad range of copyright-related permissions: anyone is free to make copies of the materials, make changes or improvements to the materials, and to redistribute them (in their original or modified forms) to others.

The recent MOOCs as popularised by Udacity and Coursera led us back to the 70’s and suggested that openness in the educational context only means open entry to courses that are partly or fully copyrighted. Some argue that this is a misconception [7].

It is important to recognise however that there is a distinction between ubiquitous availability of resources, and free and open access to resources. Many educational institutions have developed high quality educational curricula and materials and wish to protect the value invested in them. While desiring to extend access to their courses, they therefore wish to exercise control over access, and to know who is accessing them.

Openness should be advocated in the language of the 5Rs. “Open” should be used as an adjective to describe any copyrightable work that is licensed in a manner that provides users with free and perpetual permission to engage in the 5R activities:

- Retain – the right to make, own, and control copies of the work (e.g., download, duplicate, store, and manage)
- Reuse – the right to use the work in a wide range of ways (e.g., in a class, in a study group, on a website, in a video)
- Revise – the right to adapt, adjust, modify, or alter the work itself (e.g., translate it into another language)
- Remix – the right to combine the original or revised work with other open works to create something new (e.g., incorporate the work into a mashup)
- Redistribute – the right to share copies of the original work, your revisions, or your remixes with others (e.g., give a copy of the work to a friend)

These 5R permissions, together with a clear statement that they are provided for free and in perpetuity, are articulated in many of the Creative Commons licenses [7].

NRENs that are pioneers in developing access federations, and state-of-the-art authentication and authorisation infrastructures advocate that simply providing open access to education systems is not sufficient. Instead, the FAIR (Findable, Accessible, Interoperable, Re-Usable) principle of content – such as promoted by e.g., EUDAT and the Data FAIRport initiative – is the appropriate way to address Open Education. As part of this, federated access to openly licenced education content is the key to ensure the full benefits of Open Education.

Among the benefits, the TERENA OER pilot is going to investigate and demonstrate portal features associated with the proper authentication and authorisation of users such as:

- Tracking authenticated users' behaviours and categorising their learning methods.
- Providing search results tailored to the user's learning profile.
- Enriching content by collecting comments, remarks, markings (so called paradata, as opposed to metadata).
- Verifying trusted sources of learning materials.
- Providing the opportunity of peer reviews for scientific materials.

5. Engaging with Education – NRENs in Action

It's clear that the landscape of the Open Education movement is changing every day. The immense supply of OER available, and the efforts of universities to make these materials available to millions of students and teachers around the world, creates an imperative that OER must be used. The challenge today is that the supply of OER is largely unstructured and difficult to find. But eventually, the proliferation of OER will begin to reach a critical mass.

NRENs are in a good position to facilitate how OER can be findable and accessible; being more effective in helping students, in serving minority populations, improving the teaching/learning process, increasing graduation rates, and potentially lowering the cost of higher/adult education, making it more accessible.

Other than just providing and supporting the technology that delivers OER/MOOCs to users, NRENs wish to engage with educators and participate in the production of openly licenced content (course development) especially in the area of ICT and networking for the benefit of the teachers and the next generation of the knowledge economy. In return, educators should encourage students by creating appropriate policies (i.e. participate in flipped-classes where tutorials are taken online and the course focuses more on practices, or use Creative Common licences when developing learning materials, etc.) to better use the NREN services directly or indirectly offered to them.

References

- [1] Wikipedia: Open Education, http://en.wikipedia.org/wiki/Open_education
- [2] Arti Bajpai: Role of ICT in Enhancing the Educational Productivity, 2010
- [3] eLearning Papers: Issue No.23 Open Education: Changing Educational Practices, 2011
- [4] EC Lifelong Learning Programme: Open Call for Position Papers on MOOCs, 2014
- [5] TERENA TF-Media – Survey results 2012, <http://www.terena.org/activities/media/>
- [6] TERENA OER Pilot Project 2014, <http://www.terena.org/activities/oer/>
- [7] David Wiley: The MOOC Misstep and the Open Education Infrastructure, 2014

Appendix I – NREN Use Cases and Programmes

The examples below are to demonstrate the engagement of the GÉANT NRENs with open education:

ARNES (Slovenia) operates an educational video portal with embedded live streaming features and a national online learning platform based on Moodle. They are also considering the possibility of providing OpenEdX or similar MOOC platform for Slovenian education sector, where there are couple of alternatives possible. ARNES also working on the content side, they develop MOOC on “Safer Internet Use”, targeting Slovenian teachers and on “Flipped learning video series on Safer Internet Use”, targeting children and parents.

FCT/FCCN (Portugal) strongly encourages universities to provide content to the Educast@fccn portal. This resulted in over 9,000 videos on the site now, with 200 more being added every month. There have been in total about 800K views that are not very high compared to the number of videos. Therefore, FCT is trying to engage with the universities to develop and enforce policy by implementing e.g., flipped classes as well as encourage the re-use of multimedia materials that will drive up the use of the portal.

GRNET (Greece) is involved in many Open Education related projects in Europe and beyond. FORGE – Forging Education Through FIRE – project is one of them, which prepares MOOCs utilising the FIRE project infrastructures – testbeds – as part of the online courses. The project is implementing adapters using the Fed4FIRE toolset so online courses can be edited, prepared, by leveraging FIRE testbeds facilities as part of the course. There is also investigation of whether FORGE can be opened to other users – using AAI for controlled access to content. GRNET is strongly committed to FORGE because as an infrastructure provider it feels the project could open its infrastructure to interested parties. GRNET is also responsible for setting up and maintaining the metadata aggregation engine for the Open Discovery Space portal that aggregates OERs for the school level <http://portal.opendiscoveryspace.eu/>.

IUCC (Israel) established the Meta-data And Object Repository (MAOR) for Online E-Learning Resources jointly by the Israeli Internet Association and Israel’s Ministry of Education in collaboration with MERLOT, the leading U.S. repository of learning object meta-data. This national repository of information for online learning objects enables users to efficiently identify and locate quality online teaching resources and aids in their optimal utilization. The repository catalogues learning resources according to built-in meta-data and pools links to these resources, making it easier to locate objects, share with colleagues and students and evaluate them professionally. The repository is available to educational institutes, public bodies, teachers, educators and the general public.

LITNET (Lithuania) is participating in a number of Open Education projects, locally, nationally and internationally. Internationally, LITNET works with the European Association of Distance Teaching Universities, providing a distributed database of MOOCs from universities – called openuped.eu. They are also quite active in supporting the EC’s Open Education Initiative. LITNET have advertised one of their courses in the EC’s platform, developed in Moodle. On a national basis, Lithuanian universities are providing open courses in the Moodle environment. LITNET also supports lecture recording within Kaunas University.

NIIF (Hungary) operates the Videotorium.hu; a media sharing portal for scientific and educational purposes. This currently has around 7500 recordings and about 5000 registered users. Videotorium acts as a metadata aggregation point, mapping directly from metadata to the database which lies behind Videotorium. The site thus is able to provide a dedicated search interface to external learning objects via the harvested metadata.

PSNC (Poland) has recently designed and developed a MOOC platform to deliver e-textbooks in Poland to 2 million users by September 2015. The code developed will be made available in the creative commons. The MOOC has been heavily inspired by the Connections project which is popular in the US. PSNC has brought this to Europe. The MOOC was built by PSNC but it is based on existing xml-based platforms and modified for needs in Poland.

RedIRIS (Spain) operates the ARCA multimedia content portal that is an RSS aggregator for the academic community. The service is the result of a project undertaken in collaboration with the Universidad Carlos III de Madrid in order to federate information relating to multimedia content and broadcasts streamed by RedIRIS affiliated institutions. This service is a portal, a metadata aggregator open to any Internet user, which integrates the multimedia content of affiliated institutions in order to distribute them to a wider audience.

RENATER (France) is involved in an extensive MOOC activity at the request of the French Education Ministry. It also provides online a large amount of lecture capture.

SURFnet (Netherlands) has initiated the MediaMosa Foundation to look after the MediaMosa open source software that is to build a full featured, webservice oriented media management and distribution platform.

SWITCH (Switzerland) provides SWITCHcast which is a sophisticated video management system, by means of which lecturers can very simply record their lectures, upload them to a central server, post-process them and make them available to students via the internet - both as online streams and as downloads for offline use. The SWITCHtube service allows every university to provide its members with a dedicated video portal featuring any number of subject-specific channels. Students as well as teaching and support staff can use their AAI login to access the content on their mobiles, tablets and PCs, share it with others and add their own contributions.

UNINETT (Norway) is in the process of launching a national OER video portal pilot, to get optimal use of the increase in video production for flipped classroom, lecture capture and MOOC. Demand for lecture capture is increasing in Norway and UNINETT are already experiencing an average of 600 Mbps traffic from the streaming servers during daytime. The next step is to look into content sharing and OER.

Appendix II – TERENA Compendium Data 2013

Table 6.2.4.1 – Multimedia content repositories

Country	A	URL of the repository:	B	C	D	E	F	Size (in TB) of the repository:
GÉANT partner countries								
Azerbaijan	Plan		Plan	Affiliates				
Croatia	Yes	mod.camnet.hr	Yes	Limited	Plan	oai-pmh,rss	Yes	
Czech Republic	Yes	videosever.cesnet.cz	Yes	Limited	Plan	oai-pmh	Yes	40+
Denmark	No	www.edumedia.dk	Yes		Yes			
Estonia	Yes	www.koolielu.ee	Yes	Affiliates	Yes	oai-pmh	Yes	0.05
Finland	Yes	tv.funet.fi/medar	Plan	Limited	Yes	oai-pmh,rss,open-api	Yes	250
France	Yes	www.renater.fr/Video/ and www.rap.prd.fr/ressources/vodMenu.php	Yes	Limited	No		Yes	1
Georgia	Plan		Yes	Everybody	No			
Greece	Plan		No		No		Yes	
Hungary	Yes	videotorium.hu	Yes	Affiliates	Yes	oai-pmh	Yes	10
Ireland	Yes	media.heanet.ie	Yes	Everybody	No		Yes	6.5
Israel	Yes	maori.ucc.ac.il/english.php	Yes	Everybody	Yes	oai-pmh		
Italy	Yes	www.garr.tv	Yes	Affiliates	Yes	Rss	Plan	0.06 T (60 GB)
Macedonia	Plan							
Malta	Plan							
Moldova	Plan							
Montenegro	Plan							
Netherlands	No	www.surfmedia.nl	Yes	nren	Yes	oai-pmh,rest,rss,open-api	Yes	
Norway	Yes	mediasite.<customer>.no and screencast.uninett.no	Yes	Everybody	Plan	rss,other	Yes	We are currently storing about 12 TB of content
Poland	Yes	Eg. http://tv.pionier.net.pl	Yes	Limited	Plan	oai-pmh	Yes	11.4
Portugal	Yes	zappiens.pt	Yes	Everybody	Yes	oai-pmh	Yes	
Romania	Plan							
Serbia	Yes	media.amres.ac.rs	Yes	Affiliates	No		Yes	0.05
Slovakia	Plan							
Slovenia	Yes	video.arnes.si	Yes	Affiliates	Plan	oai-pmh,rss	Yes	
Spain	Yes	arca.rediris.es	No	Limited	Yes	Rss	Yes	
Sweden	Plan							
Switzerland	Yes	cast.switch.ch	Yes	Affiliates	Yes	oai-pmh	Plan	20

Legend:

- A – Does the NREN run a multimedia content repository?
- B – Is video sharing/upload by user possible?
- C – If “yes” or “plan”, who can upload content to the repository?
- D – Is metadata exchange with external content aggregators possible?
- E – Technology/protocol used for metadata exchange
- F – Is a live streaming service offered for users?