How to foster sharing of educational resources?

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Abstract
The future of OER is highly dependent on the future of education in general. A future that will be determined by major changes in society that demand more people with a higher education and life long learning. Each vision for the long term future needs to take the qualitative and quantitative demands into account. Backcasting from a vision we arrive at useful steps to take, some of which we managed to start up in the form of pilots as part of the European research project Share.TEC.

Keywords
Open Educational Resources, sustainability, backcasting, share.TEC

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The past ten years we have seen a large amount of Open Educational Resource (OER) initiatives which were welcomed enthusiastically by the field of education, the general public and funding bodies. The large amount of OER stimulated additional work on metadata and search tools that could browse through all these repositories helping the user to find the right resource. But now subsidy streams move to newer topics en vogue today and we will have to make the next step and realise implementation strategies and business models that give OER a place in education.

For some time it was hoped that practitioners would pick up OER and implementation would be semi-automatic. Initial studies (Duncan, 2009; Vuorikari, 2009) however indicate the amount of (re)use of OER is disappointing. In general it can be stated that most resources that are made available as OER are never reused in another educational context. Especially cross-border reuse is rare and limited largely to resources in the English language (Vuorikari, 2009). Also only few studies indicate substantial learning effects from learners directly using OER provided, CMU's Open Learning Initiative being one of the notable exceptions (Lovett, 2008).

Many explanations for the lack of impact of OER are possible and can be found in recent OER literature. We want to mention only one which is often ignored: Quality. Although the Hewlett foundation, as one the primary sponsors of OER projects emphasizes that high quality educational materials will be made available and the aim of most OER projects will have been to realise just that, it is clear that most OER is not of top quality. Just take two of the most successful projects: MITOpencourseware and OpenLearn. Most courses provided by MIT in MITOpencourseware are not suitable for self-study and are not a first choice for students to learn about the topic. As far as re-use by other educational institutes is concerned most MIT courses are also a bad starting point: old fashioned lecture based instruction which anno 2010 can only be used by top experts in the field with superb presentation skills. The Open University with OpenLearn focussed more on providing self-study courses. Unfortunately it looks like most effort was spend on developing beautiful tools and not on developing high quality courses (Donald Clark, 2008).

Recent research (e.g. Vuorikari, 2009) recognises the lack of impact of OER and suggests solutions to get OER accepted more widely. We distinguish three approaches:

The first approach we call: "make it better and bigger" .Examples are improving search engines, automatic metadata abstraction, combining repositories to form national or even world wide referatories, etc.. There is nothing wrong with his approach, which is widely used by colleagues specialised in ICT and education, as long as there is clear proof that by doing the work an important obstacle is removed or a critical scale size reached.

The second approach can be coined as "Add some goodies". Especially graphical and web2.0 tools are popular. Graphical browsers, communication and collaboration facilities, Google maps, rating, mind maps, etc. are added often on the basis of only a vaguely defined hope it will help the learner.

Popular with researchers looking for business or sustainability plans for OER is the third approach: "Generalise from successful cases". MITOpencourseware and OpenLearn are used frequently as successful cases. Because the success of these projects is more of a marketing than educational nature one might be tempted to suggest OER should focus at PR and marketing (Friesen, 2009).

Our point is that these approaches often will lead us to suboptimal solutions because a too narrow view on the educational domain is taken. We suggest that R&D work in the OER domain should be driven by a vision of what sustainable education in general could look like. A comparison

with the vision of a sustainable society will clarify this point. A sustainable society has the use of renewable energy sources as a logical consequence and from there the employment of wind turbines. But this of course does not imply that we need to strive towards a sustainable employment of wind turbines. On the contrary it is very likely that technical innovation will make their use out of date in the not to distant future. In the same way OER might be a useful instrument in attaining sustainable education, but sustainable OER is not a goal in itself.

This brings us to the next question: what is sustainable education?[1] Is the current educational system not sustainable? What are the threats and what is our vision of a sustainable educational system? Of course in the context of this paper we can only hint at possible answers to these broad questions. Two elements are key to defining this problem: limited resources and required change. For required change the implications of the knowledge society are most pervasive. A need for more people with a Higher Education degree is a consequence. But also learning materials tend to be outdated faster and faster. Also job requirements change more quickly forcing people to become life long learners. What makes the current educational system not sustainable is that the current infrastructure cannot cope with these demands on the basis of current budgets. But budgets for education on average cover between 5 and 10% of the total national budgets and it is unlikely they will increase significantly if at all.

For arguments sake we could state that a sustainable educational system should have double the productivity of the current one. Is this feasible? When we take a look at productivity in other fields that moved from old-fashioned craftsmanship to more modern production methods the answer is affirmative. From cars to iPods the next model is better and cheaper to produce. Also looking at the value for money offered by Universities indicates that major productivity gains must be possible. Take for example a law student in the Netherlands. Student and government together pay the university 7500 euro per year. The education of a first year law student at a specific university consists of two group sessions of two hours led by an year 3 student and one two hour lecture per week. A year has 40 weeks. Six times per year the university rents a gymnasium where the 300 students take an examination. Could you do better given 2.250.000 euro? Of course this example does not prove anything. Maybe legitimate overheads are enormous. Maybe a university that mainly depends on the number of graduates they produce will invest less in first year students showing high drop-out rates. The key point here is that a long term vision departing from the demands of the modern knowledge society will entail a very different educational system.

Our vision of how sustainable education in 20-30 years from now is limited to a number of key characteristics of the educational system:

- total costs in terms of percentage of gross national income will remain about the same;
- productivity will need to increase with at least 100%;
- quality assurance of educational programmes will move from a national to an international level;
- modules of an educational programme can be provided by different (commercial and non-commercial) providers;
- educational services (teaching, assessment, learning material development, coaching, quality control, research) from different sources are combined to create optimal educational products;
- international and commercial competition will force educational institutions to innovate continuously and provide the best value for money;

- in short: education will be much more open (Wiley, 2009)

But how does this help us today with decisions about research and business strategies for OER? For this we use an approach called backcasting which we borrow from the field of Environmental sciences (Dreborg, 1996). Backcasting works backwards from a particular desirable future to the present to find the best measures to be taken to bring us closer to the desired state. Backcasting can best be used when:

- the problem is complex (e.g. multidisciplinary, involving several sectors of society);
- the solution requires a major change (just analysing the current state will not help);
- dominant trends are part of the problem (e.g. knowledge society requires more education);
- the problem is created by factors external to the system;
- a significant amount of time (e.g. five or more years) are available to solve the problem.

When deciding what research to conduct we now evaluate how the work contributes in bringing us closer to the desired state. This prevents a focus on what is perceived as problematic today. When having multiple options to choose from heuristics can be used like: prefer more generic solution above special purpose ones and pick low hanging fruit first.

It is in the context of the European research project "Share.TEC" (www.share-tec.eu) that we are trying to apply this approach. The Share.TEC project aims at developing an infrastructure for sharing educational resources in the domain of teacher education. The first version of Share.TEC can be accessed at http://sharetec.it.fmi.uni-sofia.bg/. Using common meta-data schemes Share.TEC searches a federation of repositories contain material related to teacher education. Searching, especially cross-border, is enhanced using ontologies. Apart from standard metadata more informal user data is collects using web2.0. techniques, like rating by users. Figure 1 gives an impression of the version of the system of September 2010 using some screenshots.

One year in the project (June 2009) it turned out to be difficult to draw up a sustainability plan for the Share.TEC system after the completion of the project Summer 2011. In 2010 a second attempt was made but again without very specific results. We decided to create a number of cross-border pilots where our end-users (teacher educators) worked on a specific educational innovation of their choice. The Share.TEC service will be available for these pilots but it's use not obligatory.

Backcasting from the more generic solution of sustainable (higher) education we can formulate a number of potentially useful steps that could be tried in the context of our project. For example:

- make an international collection of learning materials in a specific area within the domain of teacher education, form a group of experts that analyse and annotate these resources;
- provide good examples of ways of using a specific type of resource (e.g. online scientific journals) and promote their use;
- sharing resources in terms of complete courses, including shared course development, sharing quality control and research and sharing teaching resources;
- defining a common online component for different courses given by different organisations in different countries (Morgan & Carey, 2009);
- sharing design templates as an efficient way of sharing the expertise (Dimitriadis, 2009).

A two day workshop was organised (28-29 July 2010 in Bologna, Italy) for teacher educators from several European countries. They formulated eight specific pilots based on specific needs

existing within their teacher education institute. Eight pilot projects were set up during the workshop:

Myschoolsnetwork. As its primary target the pilot addresses training for secondary school teachers. Specifically, it concerns preparation and reflection about experience gained in praxis (Dutch student teachers engage in practice from Year 1 to Year 4 of their training) and through praxis in virtual environments.

The online scientific journal. The basic idea is to gather information about available online journal in domains relevant for TE and collect / describe ways of using these resources for learning. Teaching academic writing skills is one obvious application, but there are others.

Erasmus follow up. Erasmus is a student exchange programme funded by the European Communities. The programme is aimed at improving mobility and knowledge transfer between higher education institutes in Europe. The aim of this pilot is to find ways to reify the experience gaines in such a way that is disseminated widely.

Creating, Sharing and Re-using Resources in Foreign Language Teaching on Primary Schools. This pilot wants to find a way to create and share resources that can be used as broadly as possible.

Learning disabilities & teaching. Teaching learners with learning disabilities often requires specialized learning materials. These materials are often developed by experienced teachers based on many years of experience. Sharing and re-using is possible but requires access to the know-how of their developers.

Design of learning and organizing distance courses in ICT and learning. This pilot focus is on the design for learning for teachers and teacher students.

Managing innovation project in education. This pilot start from an existing on-line course on learning project management skills needed to lead innovation projects in education. An completely open course in English and/or a course with a shared online element used by multiple higher education institutes is the aim of this pilot.

Social software and Teacher Education. Finally the last pilot aims at developing a online "handbook" for teacher educators who want to use social software either for their own learning or in their teaching.

The pilots will give us feedback on when and how the Share.TEC system can be used in very different situations. But at the same time useful steps are made towards open and sustainable higher education and our vision further refined.

Conclusion

It is too early for specific conclusion about the pilots that have been started. But it was surprisingly easy to find teacher educators interested in setting up and working on pilots that fit our "agenda".

Based on the vision of sustainable education we listed steps that could be taken to arrive at this desired state. These steps also have implications for an OER agenda:

- making education cheaper has OER related goals:
    - share development costs;

    - promoting reuse of high quality resources (ideally there will be one or a small number of very high quality courses available for any topic);
    - in the form of students, materials and teachers,
    - organisation perspective not individual teacher
- making education more effective is a rather new goal for OER. Work could include:
    - supporting educational research with standards for student data to be collected
    - provide models and tools for continuous improvement of courses. The model used in the OpenLearningInitiative (Fig. 2) might be a good starting point here.

Figures

Figure 1 Screenprints from the Share.TEC portal

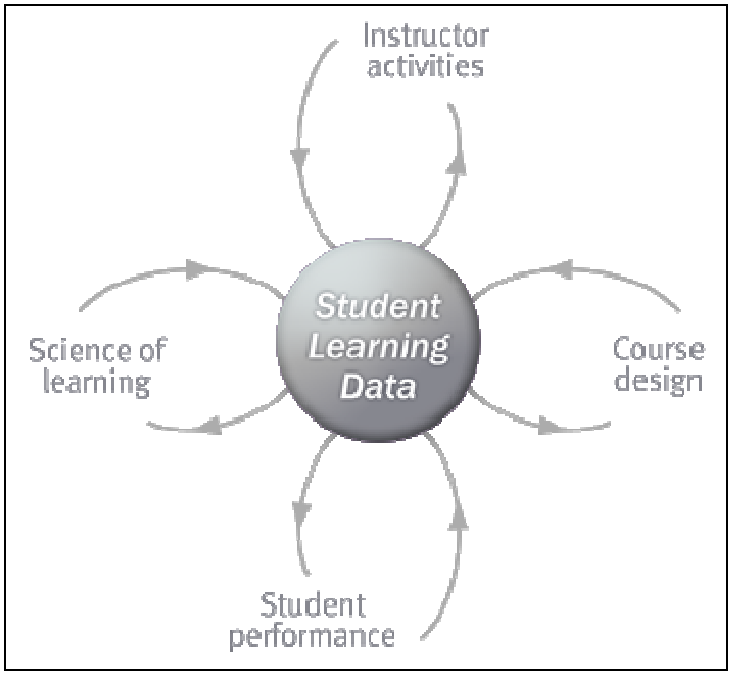

Figure 2. An OER model build around student data as used by Carnegy Mellon's Openlearning initiative (http://oli.web.cmu.edu/openlearning/initiative)

Notes

1. Sustainable Education should not be confused with sustainability initiatives like "Greening the Campus" which merely copy generic sustainability principles to the world of education.

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