



Repository Strategies

Thematic synthesis report

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EdReNe

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eContentplus

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¹

OJ L 79, 24.3.2005, p. 1.

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Conclusions

The majority of educational repositories share the overall goal to enable educators and students to have **seamless access** to **high quality** learning resources and to **support sharing, repurposing and remixing** of these. This has been a long standing vision and many experiences have been collected during the last ten to fifteen years.

These experiences coupled with the rapid evolution in web based technology and increased access possibilities should in combination provide a solid foundation for making the vision a reality.

On the strategic level of setting up the infrastructure to support this goal, this report recommends to:

- Carefully build a sustainable business case based on the broad existing evidence base
- Engage with all stakeholders early in the planning process and base development on user needs
- Acknowledge that integration with a range of tools and services will greatly benefit uptake and use of digital learning resources. One important driver is a common authentication solution
- Take advantage of generally used, open standards to allow for the broadest range of partnerships, future adaptability and innovation
- Leverage the support of existing communities of practice by supporting their needs. One aspect is to engage end users in quality assurance
- Support open licensing to increase impact of funding and maximise possibilities for reuse and repurposing

More detailed recommendations and background information can also be found in the EdReNe synthesis reports on: i) Standards and Interoperability; ii) Rights Issues; iii) Engaging Users and Producers



Selected results from a survey conducted during the 2nd strategic seminar (Lisbon, June 2008), showing which issues participants judged as being important to share knowledge about in order to define and implement a successful repository strategy (based on 35 answers)

A prevalent trend seems to be aiming at providing a *national* infrastructure and ensuring implementation based on open standards for all relevant interfaces. This will in turn allow all stakeholders to build innovative services upon the common parts of the infrastructure, rather than prescribing any specific central service.

The emphasis of this report is primarily on the case of how to approach the task of establishing a coherent infrastructure which can both include existing content and services and lower the barriers of entry for new producers and providers. This calls for central coordination and facilitation (by Ministries of Education) – but not necessarily in the form of providing centralised solutions for most components.

Important aspects of an overall strategy which will not be detailed in this report, but separately discussed in other EdReNe synthesis reports³ are the areas of:

- Standards and Interoperability
- Rights issues
- Engaging users and producers

Most of the sections of this document will represent one (or more) of the topics that have been identified by network members as the most important, at the strategic seminars held during the EdReNe project period (see illustration above).

Building and maintaining a repository

The vision of an active online community of teachers legally using, sharing and repurposing learning resources by means of fully interoperable user friendly systems has been with us for quite a while. It does however still to a large extent remain more a vision than a reality even though great progress has been made to overcome many of the barriers that have been identified during this process over the last ten to fifteen years.

“Houses are built to live in, not to look on; therefore, let use be preferred before uniformity, except where both may be had.”

- Sir Francis Bacon (1561 - 1626), *Essays: Of Building*, 1623.

The first national educational repositories represented in the EdReNe network were launched more than fifteen years ago in 1993-1995. The overall goal of ministries have been to provide learning resources to the target user groups, and some governments drive to transform teaching and learning in schools by improving access to ICT and multimedia resources for all pupils. Some ministries finance and produce digital learning resources themselves (e.g. France, Spain, Hungary and Norway) or provide specific funding for schools enabling the free access to or purchase of learning resources produced by professional publishers (e.g. Austria, Italy). A number of countries also provide free tools to make it easier for teachers to develop new content. These initiatives currently supplement and coexist with commercially available content from private publishers⁴.

The general picture currently is that creating and maintaining *national* educational repositories⁵ requires public funding in some way or another. In most cases the public involvement is based on a government strategy to promote the (re-)use of digital resources and tools in education and thus maximise the investments made, funding the production of such content. An important element of these policies is also to form communities of teachers interested in collaboration and willing to share educational experiences and materials.

More than 80% of the EdReNe repositories include both metadata and content. The trend seems to be that older repositories are “referatories” linking to external websites with a move to repositories where you can deposit finished content and the next probable step being co-development of content at the repository.

The current distribution between various types of content differs quite a lot. Except for specialized video/photo collections the norm is that repository content is a fairly broad mix of text documents, video, audio, graphics etc. A few repositories also include non-digital materials (e.g. text books). A little less than a third of repositories surveyed indicate to have a mix between free and commercial materials.

³ These are available from the EdReNe web site: [Standards and interoperability](#); [Rights Issues](#); Engaging Users and producers (to be published March 2010)

⁴ As discussed in the EdReNe synthesis report on Rights Issues this adds to the complexity and also clearly illustrates the need for new business models in the content producing industry, especially among traditional publishers.

⁵ Or in an increasing number of countries a national *infrastructure connecting and supporting* repositories

It is worth noting that in recent years the necessity to provide educators with assets in the form of images, sound, music etc. has been dramatically reduced by open licensing of such assets. Focus for educational repositories are thus likely to shift to from assets to actual learning resources.

In most countries traditional textbooks are still preferred by a majority of the teachers. A repository may thus increase its impact if it includes these traditional learning resources, too. Another option is to work harder to market a repository of only digital content. This is the case in many countries, where public authorities establish repositories to bring focus to and to encourage the innovative use of digital learning resources.

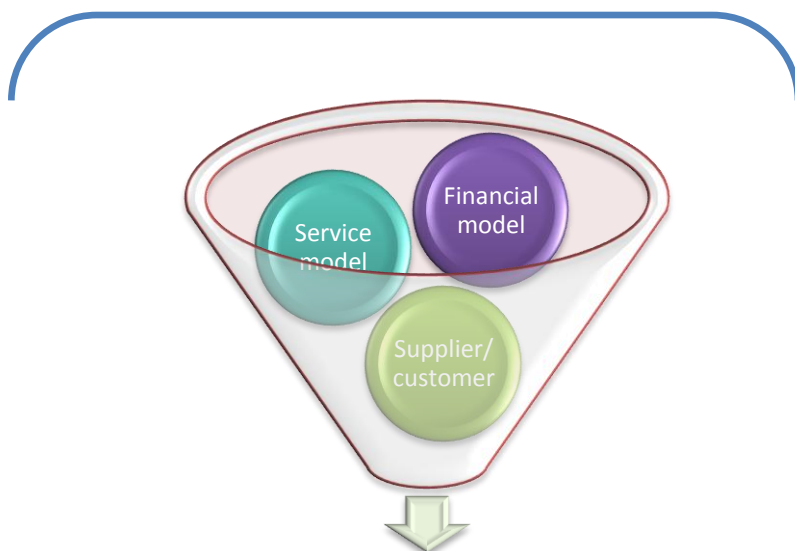
Business models

With the large investments that have already been done in setting up (publicly funded) repositories it is interesting to take a look at the underlying business cases and the models that they are based upon. Not many studies have however tried to describe and articulate existing business models for educational repositories until recently, where a JISC funded study analysed a number of different repositories in detail⁶. One of the intentions with the study is to help formulate business cases for new repositories.

The intention of elaborating more on the business case than has been customary to many repositories would be to provide much more attention to fully describing the intent – *knowing the objectives* – of launching a specific repository in the early planning phase. Or put another way, to encourage an approach which starts with the needs (required benefits) instead of a preferred model. At the same time it will help to prioritise the goals intended for the service and make it clearer that by making specific business model choices certain benefits are more difficult to achieve.

When putting together a business model for sharing learning resources, there will be general issues such as the involved *range of stakeholders, existing competition and choice* and possible *partnerships* to consider. In addition, the defining of a *sustainable* repository business model would need to at least include consideration of⁷:

- **Financial model.** The resulting services clearly depend on the chosen (possible) financial model. This is also the element of a business model which needs refining as services go through various stages of maturity. The sustainability of a service is of course also closely linked to the finance model. Initially, finance models are closely linked to the viability and later to the sustainability of services.



Repository business model

Business models for educational repositories can be divided into: i) the financial model, ii) a service model for the repository, and issues to do with iii) supplier/customer relations. All of these will be important to thoroughly describe and consider when describing the business case and choosing the model for any given repository service.

⁶ McGill, L, Currier, S, Duncan, C and Douglas, P (December 2008): [Good intentions: improving the evidence base in support of sharing learning materials](#).

⁷ Adapted and abbreviated from the more thorough discussion of repository business models and building business cases in the report mentioned in³ (primarily further and higher education examples)

- **Service model.** A thorough understanding of the market is essential for any product or service to be successful. It is not enough to recognize the different possible tiers of a market (primary and secondary target groups) but indeed necessary to carefully describe the needs and motivations of these, in order to be sure to build the service around user needs and not funder/curator needs.
- **Supplier/consumer model.** This is one of the most difficult areas to model consistently when it comes to educational repositories. In many cases there will be a significant overlap between supplier and consumer roles, in other cases less so. The contexts of use will also vary tremendously especially for open sharing models.

Overall the business cases for repositories can be grouped into those building upon existing communities of practice (often subject-based sharing) or open sharing models. Depending on the approach taken the benefits of sharing will differ for learners, educators, educational institutions, and the national or global community.

When building a national infrastructure (or other federations) to provide access to learning resources, enabling business cases for small and large content and service providers should be part of the planning. As an example of this approach, Becta has recently published a strategy to establish an ecosystem that aims to enable the discovery, delivery and sharing of learning resources and this is now entering its first phase of implementation⁸.

Strategies for involving key actors

An essential part of ensuring the success of any repository is to involve all stakeholders in the process as early as possible. This might seem obvious but is nevertheless often neglected.

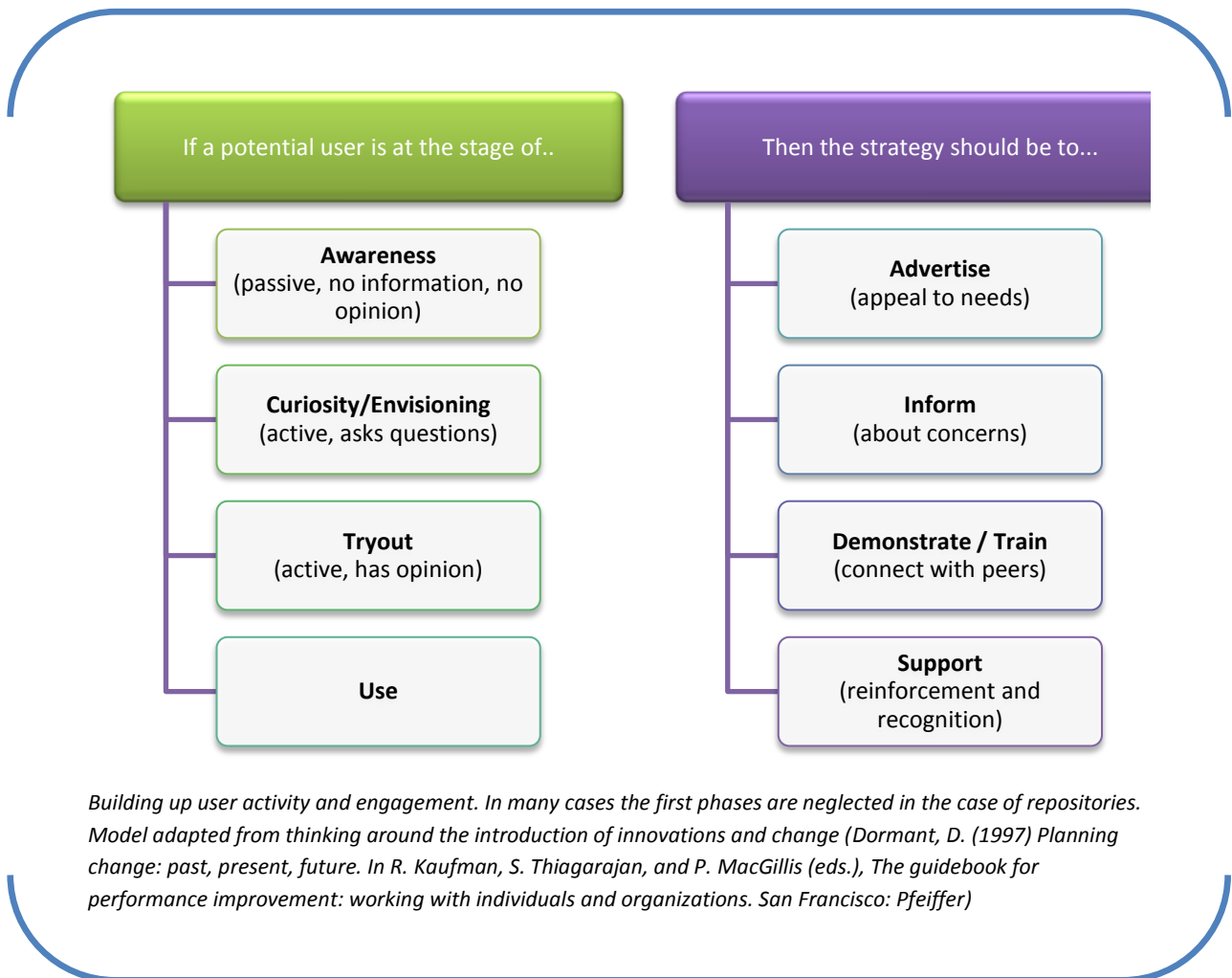
Early in the process of establishing a repository a list of user needs should be matched with the benefits likely to be gained by implementation of the repository. The list of benefits to all involved stakeholders should have come naturally from building the business case for the repository and be ready to be tested on and discussed with all stakeholders. Experiences show that being as open as possible, as early as possible, during the development process is the best way to attract opinions and ensure a vibrant community around the implementation.

In a national context it will be necessary to inform and coordinate to a rather broad community including the groups of:

- Commercial and non commercial content producers, providers and publishers
- Providers of commercial and non commercial tools and services that support the creation, adaptation and use of digital resources
- Providers of commercial and non commercial tools and services that support the discovery, delivery and sharing of resources
- Organisations representing the needs of users of the above content, tools and services.

⁸ Strategy document and implementation roadmap can be found online at <http://industry.becta.org.uk/display.cfm?resID=41250>

Many early repository initiatives have been centred on a “if we build it they’ll come” (or in some cases “if we fund it they’ll come”) philosophy without taking due notice of which benefits individual stakeholder groups are likely to gain from the repository, and which phase of awareness they are in. Quite often decisions have already been made at the time when important stakeholders are involved and focus has been more on training users for the system already implemented than listening to user needs and concerns.



Benefits that trigger repository use

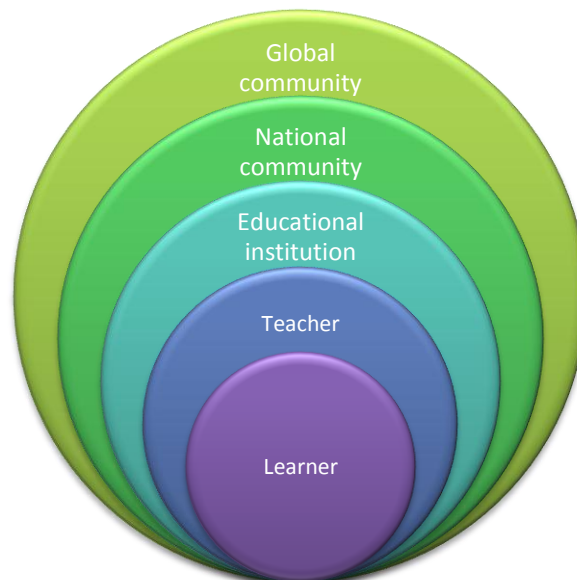
The vast majority of repositories in the EdReNe network have teachers as their primary target group and also share the ambition of having them as returning users at least once a week⁹. Focus should then be on identifying the benefits that will attract content from this user group.

The Appendix to this report lists some of the benefits that have been noted as connected with the implementation and use of educational repositories. The list should not be considered comprehensive but rather as a starting point for engaging with different groups of stakeholders. Whether the benefits will be realized depends to a very large degree on the business model, and for sure no single model will support all of them. Using the list of potential benefits as a tool for prioritizing between different goals and agendas by the range of stakeholders involved can help in providing a more complete picture of the objectives of a given repository (or national infrastructure).

A clear trend is that the more open the business model of the repository is, the more widespread the potential of the benefits.

Communities of practice – the best route to sharing?

Building repositories based on existing communities of practice with defined needs seems to be one of the most promising strategies. Such approaches encourage ownership and trust, often cited as essential requirements for sharing. They also offer important roads to support sustainability of services. In spite of members of a community moving away, the underlying needs of the community remain.



Layered benefits of educational repositories. Ultimately the aim of increased sharing of digital learning resources is supporting better learning – often with the underlying assumption that this will lead to a better institution/nation/world. This simplified diagram focuses on sharing as a concept and thus fails to incorporate the level of (commercial) content producers.

“Groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly.”

– Definition of a Community of Practice,
[Etienne Wenger](#)

⁹ According to a survey of EdReNe member repositories this is true for almost 90% whereas only around one third of repositories state students/pupils as a primary target group.

The strongest communities of practice between educators are often subject based or based on social relations (e.g. close colleagues from your own institution).

It is often the case that what is initially shared within such educator communities is exactly experiences and ideas on practice – *with the sharing of learning resources as a side effect*. This is in contrast with the approaches often taken from (early) central initiatives where focus has been on providing an infrastructure for sharing content and the community aspect added as an additional layer only recently being integrated in these repositories.

It is however worth noting that most (if not all) successful social networks are not just about connecting people – there needs to be “social objects” included in the equation¹⁰ – e.g. pictures (flickr), links (delicious), articles (Wikipedia) – so this should be good news for the sharing and exchange of learning resources as well, even though it might prove easier to start with discussing practice and exchanging experiences than actually sharing content. It could also be argued that this is the reason for the popularity of applications on facebook, and a reason why people with 500+ friends only regularly communicate with far fewer (where the relations have not initially been made online).

Building – or rather *finding and contacting* – communities will be further discussed in the EdReNe synthesis report on “Engaging users and Producers”.

¹⁰ See e.g. <http://www.zengestrom.com/blog/2005/04/why-some-social.html> for a discussion of why some services work well and others don't).

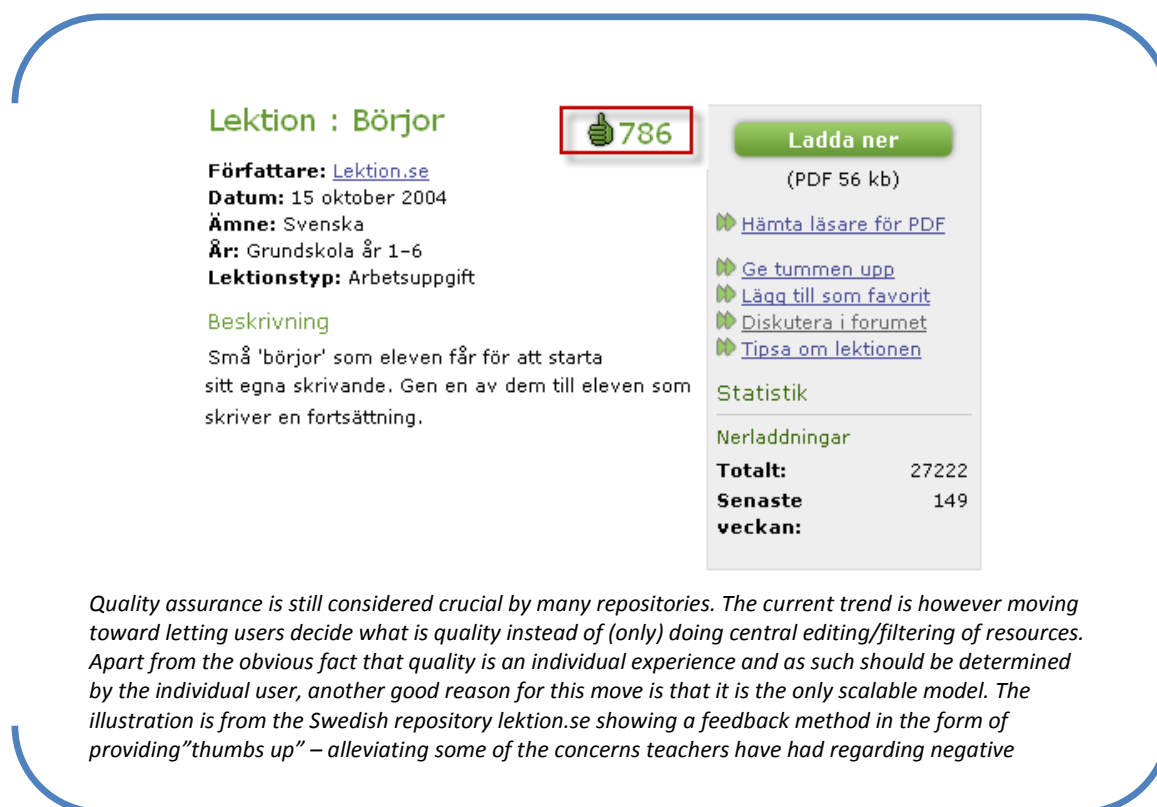
Quality Assurance

Ensuring high quality content tops the agenda of many repositories. This should not be surprising, as one of the most important areas where educational repositories should excel, when compared to general web search, is in reducing the effort of finding high quality content meeting the relevant educational context and goals for which it is needed.

This in turn means there are at least two important aspects of quality: the quality of the learning resource itself and the quality of the metadata describing it. Improving the availability, consistency and quality of information about learning resources can potentially increase their take-up and effective use.

Most quality measures implemented so far are either based on central editing and technical measures (link check etc.). This is also one of the reasons that this is considered important – central quality assurance methods don't scale and are not always transparent to end users. The trend is clearly to focus on more user involvement in these aspects.

The trends and ambitions described by EdReNe members include a higher degree of user involvement (tagging, evaluation/reviews, peer trust mechanisms etc.) and use of generated metadata to indicate "popularity" (no. of views/downloads etc.). This is still not widely put into practice – around one third of surveyed repositories currently have (plans of) implementing models relying on end user evaluations. The most successful examples of user involvement – perhaps unsurprisingly - seem to be user based repositories in contrast to traditional top-down approaches. These repositories have often started from a relatively small scale personal network, and have had the repository evolve in iterations along with the growth of the accompanying community.



Lektion : Börjor

Författare: lektion.se
Datum: 15 oktober 2004
Ämne: Svenska
År: Grundskola år 1-6
Lektionstyp: Arbetsuppgift

Beskrivning
 Små 'börjor' som eleven får för att starta sitt egna skrivande. Gen en av dem till eleven som skriver en fortsättning.

Ladda ner
 (PDF 56 kb)

- Hämta läsare för PDF
- Ge tummen upp
- Lägg till som favorit
- Diskutera i forumet
- Tipsa om lektionen

Statistik

Nerladdningar	
Totalt:	27222
Senaste veckan:	149

Quality assurance is still considered crucial by many repositories. The current trend is however moving toward letting users decide what is quality instead of (only) doing central editing/filtering of resources. Apart from the obvious fact that quality is an individual experience and as such should be determined by the individual user, another good reason for this move is that it is the only scalable model. The illustration is from the Swedish repository lektion.se showing a feedback method in the form of providing "thumbs up" – alleviating some of the concerns teachers have had regarding negative

More direct involvement of users – or finding the supporting community – is a much more scalable model both when it concerns metadata and content quality. As there can be no better measure of quality than that expressed by those who have actually used it, the task then is to find the users that will be willing to engage with this task¹¹.

The current approaches to quality assurance among EdReNe member repositories vary considerably.

Nearly all national repositories have some kind of check of correctness of metadata. In most countries the materials are being evaluated in various ways upon entry to the repositories. This task is often performed by a group of editors (expert teachers) following an editorial policy through workflow and checks. Another model is that only content from approved publishers is considered eligible. In Austria all titles are checked – by a group of teachers hired by the repository owners - in quality, technical application and copyright issues as far as possible, but there is no standard evaluation procedure. Also in Ireland all the content provided has been evaluated by teachers, who are paid to provide the review and categories. In a few countries like e.g. Italy and Denmark the repository comprises any title registered by the professional producer, and it is up to the users, the teachers and pupils themselves, to choose a resource and evaluate its quality and appropriateness.

In the new Spanish *Agrega* repository all content will go through quality assurance. Portugal will also evaluate the content in its new initiative. In Finland, in the second phase of its new approach, non-commercial publishers will have direct access to indexing their own resources in the database once the quality of the materials is checked. Also *KlasCement* in Belgium moderates content and metadata. In the Danish national repository *Materialeplatformen* editors only check whether a new resource is actually a learning resource for schools and whether it violates any copyrights or personal rights.

When quality is assessed centrally this is often done on the basis of a check list. These differ considerably but can include issues such as¹²:

- Resource design (ease of use, innovative approaches)
- Quality of assets
- Accessibility and interoperability
- Match to curriculum
- Effective learning strategies
- Assessment possibilities

More than 2/3 of the repositories also apply intellectual property and editorial policies, and standards for interoperability as part of their quality strategy. Half of them have formulated an accessibility policy.

As a further quality assurance measure around two thirds of surveyed repositories have automated link checking. Automated malware and plagiarism checks are however only rarely implemented.

¹¹ This will be covered in more detail in the EdReNe synthesis report on Engaging Users and Producers (to be published March 2010).

¹² It is not the intention of this report to suggest neither central approval nor the examples on this check list as a robust strategy for quality assurance

Integration with other services and systems

As a recognition of the fact that you need to be where the users are, there seems to be a general trend to see a repository as a set of services with a decreasing need for a dedicated user interface – or perhaps rather that the content should be presented in a number of tailored contexts including VLE/LMS, RSS readers, social web sites, browser search bars etc. The ways of exposing and receiving data from and to a given repository is thus continuously expanding.

The following paragraphs illustrate this by examining some of the important systems to link to and connect with.

Connecting and cooperating with existing repositories

One of the dilemmas educators, who are willing to share their own content is facing, is the fact that they might have a number of different options to choose from – ranging from informal “on request” sharing with colleagues, giving access through their institutional LMS, publishing on their own blog/web site under an open license, or choose a more formal deposit to a subject specific *or* general *or* institutional *or* regional *or* national *or* international repository. This choice will be affected by the different drivers for sharing, which are as diverse as making content available to students, deposit mandated by institutional policy, complying with funding requirements etc. Fulfilling as many of these needs/obligations as possible through a single deposit is one of the strong drivers for moving towards – as well as a marketing point for - completely open repository services. At the same time it does of course also underline the importance of repository federations as it is highly unlikely that the same person would be willing to deposit the same learning resource to several repositories.

Of the repositories involved in EdReNe more than half indicate that they have implemented metadata harvesting from other repositories – and the same is true for federated search.

Establishing a critical mass of quality content and making searching safer and easier are mentioned as the most important drivers for establishing this type of cooperation. Apart from technical issues, the main barriers mentioned are having aligned agendas for the different repositories involved – and in the case of international cooperation of course language of the learning resources and their associated metadata is a sometimes insurmountable barrier¹³.

Most existing federations are between educational repositories as such but an increasing interest in cooperation with museums and other cultural heritage institutions is developing – with one intended aim of such connections to provide educators (and other content producers) with assets for producing new learning resources. An important barrier for obtaining progress and success within this area is IPR handling¹⁴. Cultural heritage repositories specifically targeting schools have however also emerged in a number of countries including Denmark, Greece, Portugal, Sweden, The Netherlands and the UK, and in

¹³ Automatic translation of metadata have been piloted in a number of repositories but localization of learning resources is still a major problem for international federations crossing language borders.

¹⁴ One example is the building of europeana.eu which will host millions and millions of resources – but very limited possibilities to put them to actual use in many of the most relevant educational contexts.

these cases there seems to be given more thought to use cases of materials in educational setting including relevant licensing options.

Another promising trend is the move of major national (public) broadcasters to increasingly make their material available for use by the general public, and often building services specifically targeting education as well¹⁵.

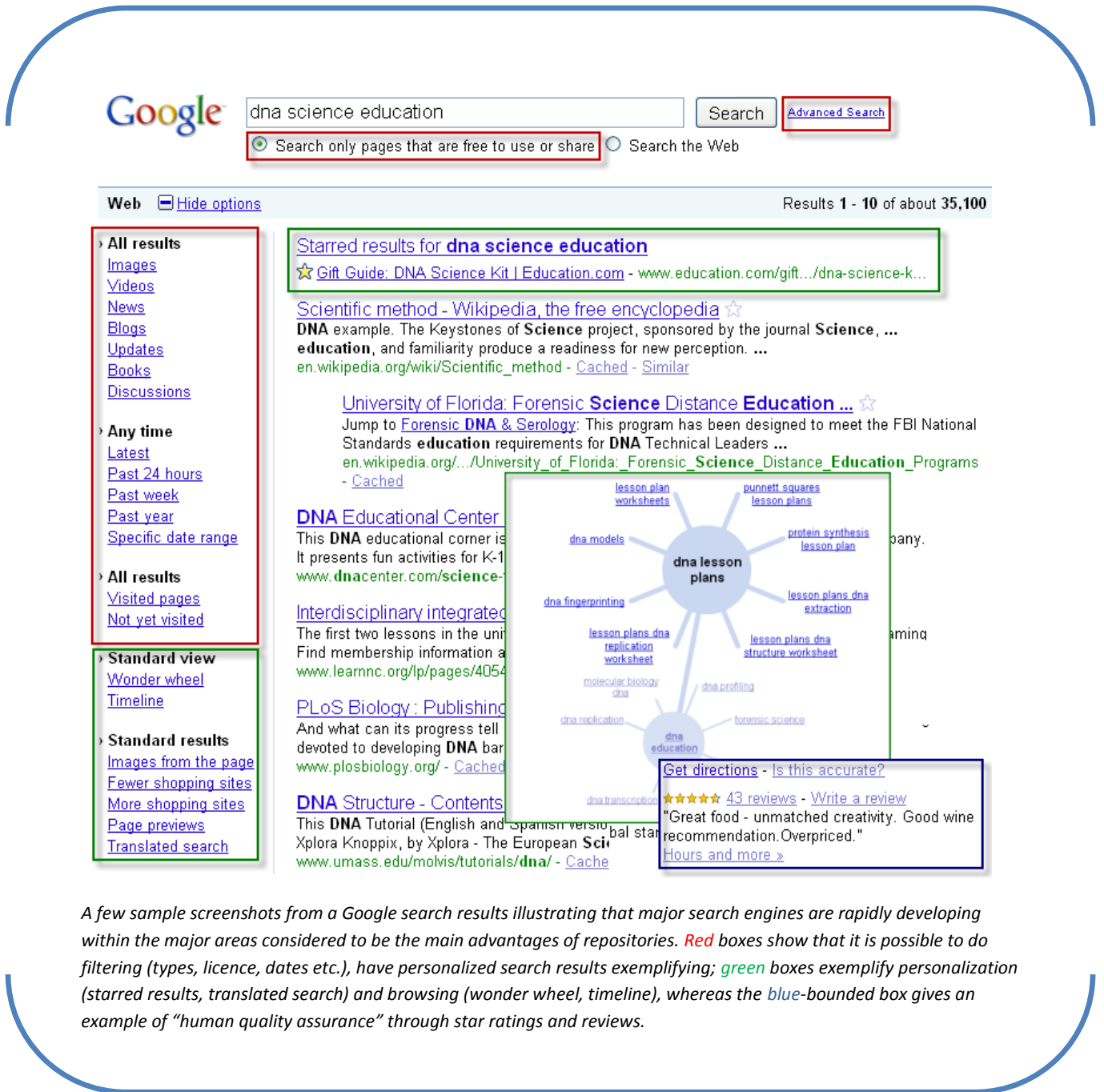
Search Engines

When educational repository owners are asked to identify the most important issues that set them apart from current general web search engines to serve their primary target audience the responses can be grouped into relatively few categories¹⁶:

- Excluding irrelevant results
 - Only educational content
 - Content developed by teachers
 - Repository content specifically targeted to user group/area of interest
 - Less is more. Fewer but better answers – it saves time.
 - Quality assurance policy of repository
 - Star ratings and comments from other users
- Better content description/metadata
 - Content linked to curriculum; educational metadata
 - Structured descriptions; field based searching; better segmentation of the information
- User interface
 - Browsing (e.g. by curriculum)
 - Better filtering options (field based); easier to discriminate different types of resources
 - No advertising
 - Possibility to tailor specific search interface to different user groups
 - Personalization
- Additional services
 - User support and training
 - Relevant articles and featured content/recommendations
 - Results integrated with and presented in other relevant educational contexts/web sites

¹⁵ See e.g. the [presentations](#) from the 3rd EdReNe strategic seminar on Broadcaster strategies..

¹⁶ The issues mentioned are compiled from responses collected during a group session at an EdReNe workshop. The list is not exhaustive but serves to give an idea of what repository managers see as the main benefits.



A few sample screenshots from a Google search results illustrating that major search engines are rapidly developing within the major areas considered to be the main advantages of repositories. Red boxes show that it is possible to do filtering (types, licence, dates etc.), have personalized search results exemplifying; green boxes exemplify personalization (starred results, translated search) and browsing (wonder wheel, timeline), whereas the blue-bounded box gives an example of "human quality assurance" through star ratings and reviews.

Using Google as an example¹⁷ (see illustration above) it is worth noting that there has been quite a lot of development within many of the areas that are considered main advantages of educational repositories, and for sure there is more to come.

Looking at the list of suggested benefits, the added value services seem the hardest part to have as an integrated part of the current search engines. This also includes supporting an active user community

¹⁷ Other major search engines have similar sets of options and developments along the same lines

although linking (existing) social networks with search results could possibly change this as well¹⁸. The structured metadata is also a current stronghold of repositories, but this is also changing¹⁹.

Despite the fact that a number of obvious advantages exist for educators to use repositories instead of general search engines, repositories do not differ from most other web sites in having a major part of their traffic as direct referrals from the major search engines²⁰. Ensuring high visibility e.g. by allowing indexing of individual resources is thus still important to attract users to the repository.

The already close links between repositories and major search engines are not likely to diminish as the focus of providing more and more personalized search results continues to increase.

Learning Management Systems – and other tools and services

The increase in the use of Learning Management Systems has had the unfortunate consequence of generating isolated information silos. At the same time they have undoubtedly led to increased use and production of digital learning resources. This makes it important to establish connections to repositories allowing both searching and depositing from within the system in daily use by educators, i.e. their LMS.

An important part in the puzzle of establishing such connections is the possibility of using a *common authentication solution* whenever this is needed²¹. This is of course very relevant not only in relation to LMS but also other tools and services for creation, delivery and use of digital learning resources. Providing single sign on solutions will undoubtedly be one of the most important drivers in the near future.

Repository interfaces e.g. in the form of search widgets are available in a number of initiatives, e.g. in Sweden, Denmark and The Netherlands, the users can meet the repository or a collection of repositories at their local school web portal or in their own virtual learning environment. The user interface or search facility can be embedded in the familiar local system - and thus closely linked with an actual community of practice where sharing is much easier to foster.

¹⁸ Social bookmarking sites (such as delicious or diigo – the latter with a special emphasis on use within education) present another trend to strategies for scalable “quality assurance” and possibilities for easily building communities. Quite a number of social networks targeting education have also arisen in recent years attracting thousands of users within very short periods of time (using e.g. ning.com as a readily available platform). Within these networks the emphasis is often non sharing practise – not content.

¹⁹ Exemplified by use of RDFa and microformats by several search engines – there is of course still a lack of defining (which and) how education specific metadata should be represented.

²⁰ Around 50% is the most often cited among member repositories.

²¹ Further discussed in the [EdReNe synthesis report on Standards and Interoperability](#)

Appendix: Examples of benefits of educational repositories

The following table gives examples of suggested benefits for different stakeholder groups / community levels. Whether the suggested benefits will actually be achieved depends to a large degree on the chosen business model and implementation of the infrastructure and services aimed at supporting delivery, sharing and use of learning resources. The list of benefits draws upon input from group discussions during EdReNe workshops but also has significant overlap with those listed in the report by McGill, L, Currier, S, Duncan, C and Douglas, P (December 2008): Good intentions: improving the evidence base in support of sharing learning materials See <http://ie-repository.jisc.ac.uk/265/>.

Global community	National community	Institutional level	Teacher	Learner	Tool / service / content provider
Supports subject-discipline communities to share	Cost efficiencies	Maintaining and building on Institutional reputation (nationally/globally)	Increased personal recognition	Easy and free access to learning materials for learners	Direct route to market
Encourages innovation and experimentation	Decrease in duplication by supporting cross-institutional sharing	Attracting new staff and students to institution	Supports sharing of knowledge and teaching practice	Anytime, anywhere access	Access to high number of users
Shares expertise and resources between developed and developing countries	Supports shared curricula	Increased transparency and quality of learning materials	Encourages improvement in teaching practice	Supports collaborative learning	Help in providing content delivery to most important platforms
Supports re-use and re-purposing	Provides evidence of the provenance of learning materials	Supports sharing across/between departments and interdisciplinary cross-fertilisation	Supports immediate one off instances of sharing	Supports development of student content within and outside formal learning	Idea generation from user generated content
Supports community input to metadata through tagging, notes, reviews	Supports discovery of most used/highest quality resources	Shares expertise efficiently within institutions	Offers one stop access to learning resources. Easier access to broader selection of material	Easily accessed through student-owned technologies	Easy access to market data and intelligence

Global community	National community	Institutional level	Teacher	Learner	Tool / service / content provider
Supports effective retrieval through professionally created metadata	Supports broad vision of sharing across institutional boundaries	Encourages high quality learning and teaching resources	Encourages multidisciplinary collaboration and sharing	Increased access for non-traditional learners (widening participation)	Common formats for content production and delivery
Ensures trust through appropriate licensing	Supports sustained long-term sharing	Supports modular course development	Supports continuous professional development and offers evidence of this	Encourage self-regulated and independent learning	
Supports continued development of standards and interoperability	Promotes the concept of lifelong learning	Easily incorporated with institutionally owned technologies	Expanding professional network	Increase demand for flexible learning opportunities	
Supports continued development of tools to support sharing and exchange	Leverage taxpayers' money by allowing free sharing and reuse of resources	Supports the altruistic notion that sharing knowledge is in line with academic traditions and a good thing to do		Increase the demand for assessment and recognition of competences gained outside formal learning settings	
Supports the sharing and re-use of individual assets	Mitigates the risk of doing nothing in a rapidly changing environment	Likely to encourage review of curriculum, pedagogy and assessment.		Encourage peer support, and mentorship	
Supports the sharing and re-use of complex learning resources	Mitigates cost of keeping resources closed	Supports preservation of learning resources		Evidencing skills development/recording assessment and feedback	
Helps to develop critical mass of materials in particular subject areas		Facilitates presentation of resources for accreditation bodies			

Global community	National community	Institutional level	Teacher	Learner	Tool / service / content provider
Supports ease of access through search engines such as Google		Enhancing connection with external stakeholders by making resources visible			
