Bridging the Gap between OER Initiative Objectives and OER User Needs in Higher Education

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The *Open educational resources* (OER) movement is a new phenomenon in the field of education. Increasing use of Web 2.0 technologies along with growing competition between educational institutions have accelerated interest in the potential of such '*open*' educational resources. Some educational institutions have made their learning resources available online for learners for the purpose of encouraging knowledge sharing and improving effectiveness of teaching and learning. Furthermore, some community organisations are also hosting and supporting OERs. However, at least some reports from educational institutions indicate that the motivation behind this move to OERs might be driven more by a desire to enhance their reputation and attract new students to their programs, rather than the promotion of OERs. This paper presents the findings of a content analysis of a sample of OER websites undertaken to identify whether 'Net Gen' learner needs are adequately addressed by current OER initiatives. The findings suggest that although many educational institutions state that their OERs allow learners to share knowledge and extend critical thinking and interactivity, the OER community organisation sites reviewed appear to be offering learners greater opportunities for online interaction, critical thinking, and reflective learning practices than the formal educational institutions reviewed. The findings of the content analysis also suggest that OER initiatives do not necessarily meet learners/users' needs. The findings from this analysis are discussed and the implications for future uptake of OERs as a strategy for supporting widening access to education in response to the changing needs of learners are explored.

Keywords: Open Educational Resources, Initiatives, Web 2.0, Open Content, Qualitative Analysis, Electronic Learning, Interactive Learning, Learner Needs.

Web 2.0 technologies have opened up new opportunities for users to generate content and engage in collaborative efforts involving content sharing. Such Web 2.0 technologies are also gaining increasing acceptance in learning and teaching because they facilitate activities that 'enable learners to take control of their own education' (Franklin & van Harmelen, 2007, p. 21). 'Net Gen' learners, those born in the 1980s and after, are said to display certain learning characteristics such as preferring non-linear access and processing of information, multi-modal learning and learning activities that are active rather than passive (Oblinger & Oblinger, 2005). However, the literature suggests that there may be a 'mismatch' between 'Net Gen' learner and teacher expectations, and that new approaches are required to bridge this gap between the needs of learners and teaching practice (Kennedy et al., 2009). One of the emergent trends in response to such changing demands has been increasing interest in the potential of open educational resources for learning and teaching activities.

Open educational resources (OERs) have gained increasing attention because of their promise and potential for promoting individualised/personalised learning practices and facilitating lifelong learning. OERs, and more specifically wikis, are regarded as potential solutions for increasing access to education for learners from different cultural and/or socially disadvantaged backgrounds. This is because wikis support multiculturalism, do not require high technological specifications, and satisfy different user needs (Hanna & Metzer, 2011a, 2011b). Furthermore, more advanced Web 2.0 technologies and 3D Virtual Worlds can support the widening participation agenda for people in remote areas, and also learners with disabilities who may find it difficult to participate in on-campus learning activities (Wood, in press).

This paper provides an overview of the nature of open access and open content educational resources, the premises on which OERs are based, and the challenges facing the OER movement in a period of transition. The finding of a comparative review of OER initiatives, which considers OER objectives, target users, the nature of materials, and learners' FAQs, are presented. The assessment of OER users' needs and OER objectives provides insights that offer greater insight into whether there is consistency in the stated aims and achievement of objectives. Addressing these differences can help bridge the gap between the needs of learners and the OER services provided by educational institutions.

What are Open Educational Resources (OER)?

Open educational resources are electronic materials that are offered freely online for users. These materials include learning modules and content management systems (Hylén, 2006), which may be either open access (OAER) or open content (OCER). Open access educational resources allow learners to access and use educational content without (or with limited) restrictions. Open content educational resources allow users (including self-learners, students, and educators) to participate in the production of content, while also using and re-distributing the content. Figure 1 shows the process of production of OERS and illustrates the differences between open access educational resources and open content educational resources.
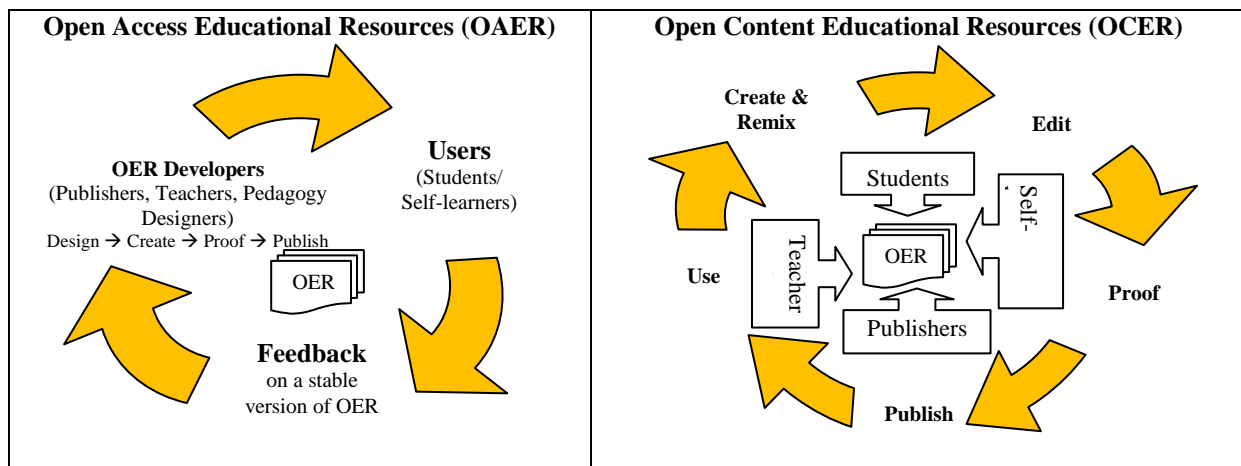

Figure 1: Production process of open educational resources

While OAER initiatives have contributed to the founding of OER repositories and have provided ongoing maintenance for host servers and content management systems, OCER initiatives also play a significant role in facilitating interaction, supporting production, and encouraging collaboration. Assessment of and discussion about the activities of some of the players in the OER market, as demonstrated in this paper, supports this view.

The goals of OERs

The primary goal of making educational resources 'open' through the use of Web 2.0 technologies is to disseminate and share knowledge for free (Yuan, MacNeill, & Kraan, 2008). Thus, OERs provide users with freedom from financial commitments and freedom from restriction of access (following Stallman, 1999). One of the fundamental basic rights articulated in the United Nation Declaration on Human Rights is that education should be (or shall be) free for all individuals (United Nations, 1948). OER initiatives, therefore, have the potential to provide the medium through which such democratisation of education can be achieved by providing 'a strategic opportunity to improve the quality of education as well as facilitate policy dialogue, knowledge sharing and capacity building' (UNESCO, 2011).

Grosseck (2009, p. 482) points to the growing uptake of the use of Web 2.0 technologies to enhance teaching and learning activities. He argues that the benefits of Web 2.0 facilitated activities include reduction in the cost of education, increased flexibility, ease of access to information, and the promotion of innovation. The 'knowledge-in-action' movement (Richards, 2009) supported by different applications of Web 2.0 has also contributed to the drive to 'reflective learning'. For example, Ras & Rech (2009) have found that the use of Web 2.0 technologies in education can significantly increase knowledge acquisition. The 'positive transfer' of learning *experience* instead of the 'negative transfer' of *knowledge* learning (Elgort, 2007) is one of the major reasons cited for incorporating Web 2.0 technologies in learning and teaching activities. As Bruns (2007, 2008) suggests, such technologies enable users to actively contribute in their capacity as product users, or 'produsers'; a term Bruns uses to describe the move towards community-based production, fluid roles, unfinished artefacts, and common property.

Many argue that the quality of OERs is indeed increasing, driven by 'open' market competition (Vukovic, 2009). It is argued that teachers and learners who are involved in the production of OERs, are motivated by 'altruistic ambitions', such as assisting developing countries and providing outreach educational services to disadvantaged communities (see for example GTP, 2005), while financial reward has been argued to be the least important motivating factor (Hylén, 2006, p. 6). Research undertaken to date suggests that the motivations of teachers and learners for using OER vary. For example, the findings of a quantitative study published on the OERCommons website (OERCommons, 2010c) suggest that students are using OERs to complete their assignments (9%), while self-learners either want to learn a new topic or expand their knowledge (~59%) or to stay current (~36%). The findings further suggest that teachers are using OERs to gather ideas for their lessons (~35%), to supplement their lessons (~30%), or to improve their teaching methods (~28%). It is apparent from these studies that the reasons for using and interacting with OERs differ according to the varying needs of different users. These findings illustrate that while learners use OERs to complete their assignments and expand their knowledge, teachers use OERs to learn new ideas for their lessons and improve their teaching methods; but both learners and teachers appear to also want to stay current and have the opportunity to network with others (Metzer & Hanna, 2011).

Hylén (2006) suggests that competitive educational institutions embark on the use of OERs for differing reasons including: 1) learning from the community about what courses work and which do not; 2) providing rapid diffusion of their courses; and 3) seeking different revenue models. However, the question remains as to why community organisations also become involved in the OER movement? Moreover, one might question whether there any differences in the reasons for user interactions with OER between OER initiatives, and further, whether there are differences between the motivations of users and the ways in which OERs are used in educational institutions and community organisations. Do OER initiatives satisfy OER user needs? Are there any differences between the explicit OER objectives documented via OER websites from the underlying implicit objectives? Regardless of whether the providers of OERs are educational institutions or community organisations, the nature of content production is argued to be the key issue in assessing objectives of OER initiatives against OER users' needs. To answer such research questions, a content analysis of a sample of OER websites was undertaken.

Method: Content analysis of OER initiatives

The main focus in content analysis of websites is not only on the technical features of the website, but also on the message form and the content, with a 'diagnostic-eye' on such matters as links, spelling, browser compatibility, image optimisation and accessibility (Newendorf, 2002), assessment of company's policies (Polariski, 2007), security, visual appearance, convenience of order process, information quality, responsiveness (accessibility of service and contact information) and interactivity (Chiou, Lin, & Perng, 2010). In other words, website content analysis has to date largely been a matter of evaluation. Gibson *et al.* (2003), for instance, applied comparative content analysis to assess party political election websites. Schweitzer (2008) found that websites of minor parties were underutilising the standard functions of websites, while major parties ran e-campaigns through sophisticated and interactive functions. While such studies may be useful in their own right, this project demands a different orientation. If website content analysis is to collect evidence of information presented to its users, then it should also be possible to use website content analysis to collect data for analysis focusing on an examination of the stated explicit objectives of OER initiatives and whether these objectives are met.

This study involved firstly identifying OER websites via a web search. From the relevant sites identified, a semi-random sample (Bourgeron, Humphries, & Jensen, 2001; Sim & Wright, 2000) of websites was chosen for further analysis. The comparison of OER initiatives involved establishing the following research criteria:

1. **The OER site stated objectives:** Content analysis involved assessing the stated objectives taking into account target users and the nature of OER materials available from the website.
2. **Target users:** Each OER website, either implicitly or explicitly, has identified target users. Understanding which users the site targets help in the assessment of the rationale of the OER initiative.
3. **Technology:** An analysis of the technology employed and features of the OER websites was undertaken to determine whether the objectives of initiating the OER are achievable. For example, if an OER website aims are to enhance collaboration among learners, but the technology employed in the website does not facilitate collaboration, there is very little likelihood that the stated objectives can be met.
4. **The nature of resources:** The educational resources available from OER websites might include textbooks, audio/video materials, simulations, course guides, educational games and educational software. Furthermore, these resources might be *open access* or *open content*. Content analysis therefore involved both identifying the nature of resources available and determining whether these resources can be characterised as being either open access or open content.
5. **The FAQs:** Since there is no way to survey users and understand their needs, the content of their frequent asked question help in understanding these needs. The questions by themselves are meaningless, so answers are represented to show common themes of needs of learners.

Results and discussion

The comparison of the selected OER websites is presented in Table 1. The analysis was based primarily on examination of each website's home page, the about-us page and the FAQs page. Other pages within the website were reviewed when more information was required for the purpose of comparison.

Table 1: A comparison of OER websites

OER	Open Content Educational Resources OCER	Open Access Educational Resources OAER
Website	**Connexions**	**OpenCourseWare**
Objectives	Connexions aims to encourage collaboration and of information sharing among learners, scientists, and people who do not read and write English, to address the increasing cost of textbooks, to make educational texts available to learners to access, and to reduce the time between production and distribution of textbooks (Connexions, 2010e)	To unlock knowledge, empower minds and help people who are socially disadvantaged. MIT, by launching OpenCourseWare, sought to enhance its reputation. Users are able to reuse the content providing they acknowledge OpenCourseWare (OCW) authors (MIT OpenCourseWare, 2010g).
Users	Authors who collaborate and create content, instructors who build and mix collections, and learners who would like to explore content (Connexions, 2010b).	The courses are available for any self-learner who would like to know more about the subject. However, learners are not awarded academic credit by MIT (MIT OpenCourseWare, 2010d). Learners of these courses are global and include: North America 40%, Europe and Russia 20%, East Asia 20%, India 8%, North Africa 5%, and Sub-Saharan Africa 1% (MIT OpenCourseWare, 2010e).
Technology	CNXML & MathML in addition to MS Word Importer (Connexions, 2010c). Content is open to learners as open access, however, in order to create content, an account must be opened. Creation of content is open to anybody. It is preferred that content is created in small modules since small modules make it easier for users to remix (Connexions, 2010d).	Static webpages, files available for download in Microsoft Word, PDF and in compressed zip files by clicking on 'download course material' link on the left menu (visit this course for example MIT OpenCourseWare, 2010f).
Resources	Textbooks (scholarly content) on which users can collaborate, from children to college students to professionals (Connexions, 2010a).	High quality open access courses which users can access. Resources include: course description, syllabus, lecture notes, readings, and assignments (MIT OpenCourseWare, 2010a). This website consists of different courses at college (university) level. These courses are available for open access by self-learners.
FAQs	Once they have accounts, OER authors, who are mainly professors and teachers, can create educational materials. Only authors can edit their created modules. However, users can make a copy of existing module and edit it as needed and republish it. Teachers and lecturers can customise their learning materials by mixing modules together to create new books, courses, syllabuses, and lessons, and to meet different learning styles of their students. Teachers cannot, however, test their students using quizzes or exams. There are options for self-assessment available for students. Students and self-learners can read and use these created modules. Connexions provide open educational resources that are free to use and reuse around the world. It	The use of MIT OpenCourseWare is free and no registration is required. MIT OpenCourseWare does not provide quizzes and exams; MIT faculty publishes content only. Only a few video lectures are available because production of video materials is very costly. Non-MIT-Students cannot have access to course-pack materials because they are copyrighted. Only copyleft materials are openly available to MIT OpenCourseWare users. MIT OpenCourseWare is not distance learning, so no degree, credit, or certificate can be obtained. However, those who wish to be MIT students, they need to contact MIT Admissions Office. However, in case of that organisations or teachers use MIT OpenCourseWare materials, acknowledgment should be made. Any

	supports different languages and different educational levels across more than 190 countries. OER brings people back to education. OER also help potential authors to publish their work (especially k-12 teachers, scientists, engineers and people who do not read and write English). The recognition that authors receive for their published work 24/7/365 universally is a great incentive. OER also help solving the high cost of textbooks (average cost $120). It helps by bringing current knowledge to learners instead of out-of-date of printed materials. In order to help users to find quality materials they need, connexions is developing a system that help authors to setup their own review process, and directs users to the content that judged to be 'high quality'. This is done through allowing users to tag and comment on modules. Connexions allow dynamic, interconnected and engaging environment since it helps learners, students, authors and instructors to communicate cross-institutions and worldwide. (Connexions, 2010e).	translation to other languages should be accompanied with a specific MIT OCW disclaimer. MIT OpenCourseWare does not offer users the opportunity to contact MIT OpenCourseWare authors, as it does not involve interactive experience. Materials in MIT OpenCourseWare are openly available to users for non-commercial educational purposes. Materials on MIT OpenCourseWare published by their MIT staff only since MIT take the final responsibility of their materials. No download, copy, modify, reuse, remix, and redistribute MIT OpenCourseWare materials should be made without permission from the copyright owner. MIT also offers OCW Scholar courses which are designed specifically for independent learners, hoping that learners provide their feedback and suggest ways to reshape content. These OCW Scholar courses are elementary courses. There are some messages and announcements from other MIT programs on MIT OpenCourseWare pages. (MIT OpenCourseWare, 2010c).
Website	**Wikibooks**	**OLI**
Objectives	To provide open books for an open world. To create free content in terms of freedom and money. To give back to humanity and help others. Teachers can use customised textbooks for their students, and learners can challenge themselves by making contributions. Authors can publish their books (Wikibooks, 2010c).	To allow independent learners to access open and free resources (material and activities). To allow instructors to build and customise their courses (OpenLearning Initiative OLI, 2010e, 2010f).
Users	Self-learners, instructors, institutions, and authors (Wikibooks, 2010a, 2010c).	Students, instructors, and institutions wishing to actively engage their students in material in various ways (OpenLearning Initiative OLI, 2010g).
Technology	Wiki which supports multilingualism	HTML, Java applets for simulations (see for example OpenLearning Initiative OLI, 2010b; 2010h which involves a simulation). This website has two groups of courses. The academic courses are not visible to self-learners. Students who have invitations can enrol when they enter the course keys. The free courses are open for any learners.
Resources	Open content textbooks that anyone can edit. These resources include: textbooks, annotated text, instructional guide, and manuals which all are instructional material (Wikibooks, 2010d).	Courses available are classified into two types: 1) Academic courses that are designed by instructors to create customised courses for their students. Low per-student maintenance fee (student may pay these fees on enrolment in their institution). Students can access instructors. There are graded exams. Instructors can trace student learning (OpenLearning Initiative OLI, 2010a, 2010e); 2) Open and free courses, which are designed for self-learners who are not

		supervised by instructors. Users are free either to register or anonymously use the content. There are no fees, tests or quizzes (OpenLearning Initiative OLI, 2010c, 2010f). All courses include course materials, computer simulations, course schedules, computer-based tutors, virtual laboratories, and self-assessment modules.
FAQs	Wikibooks aims to create free educational resources. Anyone can contribute to Wikibooks. Users of Wikibooks can download any content they like, and printing any book is also welcome by clicking on 'Printable version'. Users can communicate with other users through email lists. They can leave messages on talk pages of other users. Registered users can communicate with other registered users who have registered their email addresses by clicking on 'Email this user'. Users can contribute without having accounts; however, signing up with an account gives a registered user many benefits such as positive reputation of quality work. IP addresses of registered users remain unknown. While users, who seek recognition for their contribution, can use their real names, registered users are not required to use their real names. Users can change their pseudonym to their real names by 'Request for renaming' if they want. There is no mechanism to ensure that information in Wikibooks is correct and current since any one can edit. However, because there are many contributors, incorrect information is usually edited quickly. Users can create their own textbooks, guides, and manuals in Wikibooks. Debates and discussions are welcome in discussion pages as they help to improve content. Users, by contribution to Wikibooks, make information resources free to access. Contributions are being updated on ongoing basis which means they receive built-in feedback on their contributions. Wikibooks considers users who have dial-up connection, so there is a limit of 30 KB of page size. The site provides features that are aimed at preventing or limiting acts of vandalism (such as deleting paragraphs from a webpage) and also a facility enabling users to recover texts. Logged-in users can track certain pages if they add those pages to personal 'Watchlist' by clicking on 'Watch this page' link.(Wikibooks, 2010b).	OLI offers two kinds of courses: 1) open and free courses which allow a) access to resources, b) simulation and self-assessment, c) formative feedback to students; 2) academic courses, which in addition to the above listed affordances, also allow d) access to instructors, e) graded exams, and f) credit for course completion. OLI courses are offered based on education research: choice of and content of the courses are determined on the basis of empirical studies or the findings of evaluations. These courses are continuously updated based on feedback from instructors and students obtained through formal evaluation studies. Users have the right to opt-out from such studies. OLI expresses interest in working with teachers who would like to be part of ongoing evaluation and would like to adapt OLI courses for better teaching experience. Although accessing open and free courses does not require that users have an account, it is recommended that users create accounts to allow them to track their progress. Academic courses require registration. OLI does not grant any credit of any course. However, those who undertake Arabic courses can receive credit from the institutions of their instructors. OLI users who undertake free courses can download grade book results as a proof of their completed courses, but this does not grant credit (OpenLearning Initiative OLI, 2010d).

An increasing number of educational institutions have embraced the OER movement in response to the rapid evolution of information technologies, globalisation and its impact upon economy and social life, as well as the growing competition between educational institutions (Wiley & Gurrell, 2009). Such factors have encouraged educational institutions to be part of the 'open' movement. Although some educational institutions, such as Carnegie Mellon University and Massachusetts Institute of Technology (MIT OpenCourseWare, 2010b; OpenLearning Initiative OLI, 2010g) have made educational resources available online for self-learners and students around the world, these resources have largely remained open access, rather than open content.

The reasons, whether explicit or implicit, for providing educational resources online for students and self learners vary, but centre around the following: 1) To encourage collaboration and knowledge sharing; 2) To make positive use of technology and allow wider access to information; 3) To maximise the impact of individual research by allowing individuals to publish their research; 4) To extend research; 5) To improve teaching and learning effectiveness; and 6) To foster critical thinking.

Table 1 shows that while some of the institutions included in this study demonstrate altruistic motivations for participating in the OER movement (for example, the provision of educational resources for the public good), the findings from content analysis suggest that they are also seeking social and economic benefits (see also McAndrew et al., 2009). Such social and economic reasons for developing OERs include: 1) Developing the institution's reputation and enhancing recognition; 2) Other implicit motivations, which 'might' include advertising their fee-based courses and their methods of teaching and learning inside the university; 3) Increasing earning revenue by selling their open course materials to instructors if they wish to re-use the content; and 4) Developing course materials for the public to edit and speed up the development of courses, whether for internal purposes or for external re-use. Examples of those institutions that seek financial and social reward are MIT and OLI. Organisations such as Connexions and Wikibooks that freely make their resources open to edit and re-mix, also make revenue by selling printable versions of textbooks and from accepting donations. These forms of revenue are important to ensure their sustainability. The most important issue is freedom in terms of money and contribution. The findings also suggest that some of the OER initiatives that are hosting quality educational resources are publishing their OER materials with minimum editorial assistance at a fee to cover their operating costs.

The findings also suggest that the reasons for users accessing and editing educational resources include: 1) The desire to acquire knowledge for free; 2) They are inspired to share their knowledge with others; 3) They seek to publish their work to receive recognition; 4) Editing OERs increases their understanding through peer review; 5) OERs help users to develop their networks through emailing authors, and communication via discussion boards or discussion pages; 6) They want to help others, especially those who are economically disadvantaged, or giving back to their community. Teachers appear to be using OERs to: 1) Develop their customised course materials; 2) Re-use the available content with some minimal restructure and editorial effort, thus saving them time; 3) Engage their students in the production of knowledge as constructive teaching methods and gaining feedback on student progress; 4) Enable students' collaboration; and 5) Encourage students to translate, which may lead to localising knowledge according to society's needs, and enhancing the students' reflective learning.

The analysis of objectives for those who initiate OER and responses to FAQs show that they differ from those of OER '*produsers*'. Such analysis demonstrates that although some of these objectives are clearly stated, the content analysis suggests that OER educational institutional initiatives are not maximising the affordances of sites to meet the target users' needs (see Table 2).

Table 2: Objectives of OAER educational institutions and a critical assessment of achievement for OER *users*

OAER Education Institution Initiatives	Learners (mainly users ONLY)
Enhance the community	Learners are part of the community and their skills indirectly help to develop the community. However, users perceive that the attainment of certification/qualifications is still important. This is understood from questions, published in FAQs pages on institutional OERs, from learners about whether they will be able to receive certificates for courses they studied or not (MIT OpenCourseWare, 2010c; USQ OCW, 2010).
Unlock knowledge	Although learners are able to access information and learning materials, they are not able to share information and discuss issues and problems because most of institutional OER are only open access rather than open content.
Increase the university's reputation	Evidence suggests that by initiating OER activities, the university's reputation may be enhanced. However, do users really care about the university reputation? Furthermore, since users appear to be concerned about the need to attain formal recognition through their participation (MIT OpenCourseWare, 2010c; USQ OCW, 2010), the benefits for universities may not be fully realised.
Advertise their courses	Users who seek OERs look for free courses (or free sources of information). New comers to the for-fee courses, who visited the free courses, are willing to pay and the free courses they use are 'test-drive' offerings (MIT OpenCourseWare, 2010c; Open Michigan, 2010; Open Yale Courses OYC, 2010a, 2010b; USQ OCW, 2010).
Enhance research skills	Since the institutional hosted OERs reviewed are open access and do not allow contribution and collaboration between members of research groups (to identify problems and seek solutions), the potential for supporting the development of user research skills is limited.
Develop critical thinking	It depends on tasks provided in those courses. The development of these skills would be further enhanced if the OER websites provided opportunities for discussion and feedback.
Allow collaboration and networking	In most cases, courses are '*open*' in terms of open access, and the opportunities for collaboration are reduced in sites that do not provide communication tools such as wikis and discussion boards
Develop learning and teaching methods	Some institutions allow teachers to reuse material (with special acknowledgment).

Table 2 indicates that the potential of the sites in achieving some of their stated objectives are not fully realised because of the identified limitations. Educational institutions could benefit from incorporating some of the features of not-for-profit (NFP) OER initiatives. Table 3 illustrates the objectives of NFP OER initiatives and the corresponding achievement of users' needs.

Table 3: Objectives of NFP OCER initiatives and a critical assessment of achievements considering the OER *produsers*

Non-for-profit OCER initiatives	Learners (and they also can be *produsers*)
Unlock knowledge	This objective is likely to be achieved since users can be proactive in creating and sharing content and they can reflect on their understanding and share their experience in the content.
Foster openness	The sites reviewed maximise the affordances of the open content movement by enabling users to edit, share, use, reuse, remix, download the content without (or with minimum) restrictions.
Increase research skills	The openness, and the ability of collaborative writing and sharing information, as well as discussions, allow users to develop their research skills
Enhance collaboration	The sites reviewed employ features that maximise the affordances of collaborative learning environments by providing opportunities for collaboration through discussion pages, discussion boards, built-in messengers, visible email contact of users, and wikis (or any similar technologies).
Develop learning and teaching methods	This objective is facilitated by enabling teachers to use the content, reuse, and remix. Learners are also to edit content and share their experiences supported by the collaborative nature of the sites.

This paper identifies two kinds of OERs: OAER and OCER. The findings from comparative analysis of these different OERs suggest that education institutions which produce and host OERs, are offering OAER for learners, while community organisations that are responsible for maintaining and running content management systems for OERs are showing a greater trend towards supporting OCER. As discussed in this paper and shown in the preceding comparative analysis, the objectives for not-for-profit (community) OER initiatives differ from educational institution OER initiatives. Furthermore, the findings of the OERCommons survey (OERCommons, 2010a, 2010b, 2010c) suggest that teachers are using OERs in their teaching and learning activities for a variety of reasons. Teachers derive both direct and indirect rewards from such involvement. Such rewards might include career enhancement as future contributors in the 'open' movement. Moreover, since remixing and editing requires time and effort, '*produsers'* may undertake these activities to make their time more productive. It might be argued that those self-learners who want to learn without necessarily attending school, may be seeking more productive use of their free-time. Moreover, as with not-for-profit organisations, some OER websites publish photographs and information about socially disadvantaged areas of developing countries (GTP, 2005), and in this way motivate users to contribute to the OER movement to promote social justice.

Conclusion and areas for further research

This paper highlights the increasing interest in the use of OERs for teaching and learning activities. Since, as the literature suggests, 'Net Gen' learners have a preference for active and collaborative learning, it is reasonable to expect that OCER initiatives are more likely to meet their needs than OAER. Although OER initiatives aim to make educational knowledge available for free to learners, as outlined in the objectives of institutional OER and NFP OER initiatives, the findings from this study demonstrate that open content OERs potentially hold additional benefits for their users than open access OER alone. Since OER users are demanding more benefits for themselves, such as developing creative thinking skills, unrestricted access to knowledge sharing and collaboration, the future of OER will be for open content material, not for open access material alone. Universities, schools, and research institutions need to be prepared for such a transformation of learning materials to meet the changing demands of learners in a knowledge based society.

Although this research did not survey or interview contributors to the OER movement or users of OER sites themselves, the analysis undertaken of users' FAQs provides some insight and understanding of their needs. This study is also limited by the small sample of OER sites included in the analysis. Moreover, the study would be strengthened by incorporating inter-rater reliability reviews of the sites. Future research involving interviews and focus groups with OER users, both teachers and learners, would help to provide greater insight into the benefits of OERs in teaching and learning. Despite these acknowledged limitations, the study has highlighted areas for further consideration by educational institutions that are positioning themselves to respond to the changing demands of 'Net Gen' learners and the widening participation agenda.

References

Bourgeron, P. S., Humphries, H. C., & Jensen, M. E. (2001). General data collection and sampling design considerations for integrated regional ecological assessments. In P. S. Bourgeron & M. E. Jensen (Eds.), *A guidebook for integrated ecological assessments* (pp. 92-107). New York: Springer-Verlag.

Bruns, A. (2007, April 27-29). *Produsage, Generation C, and their effects on the democratic process.* Paper presented at the Media in Transition: Creativity, Ownership and Collaboration in the Digital Age, Massachusetts Institute of Technology (MIT), Boston, USA.

Bruns, A. (2008). *Blogs, Wikipedia, Second Life, and beyond: From production to produsage*. New York: Peter Lang.

Chiou, W.-C., Lin, C.-C., & Perng, C. (2010). A strategic framework for website evaluation based on a review of the litrature from 1995-2006. *Journal of Information & Management, In Press*.

Connexions. (2010a). Connexions' approach and phylosophy Retrieved 20 April, 2010, from http://cnx.org/aboutus/index_html

Connexions. (2010b). Connexions' home page Retrieved 20 April, 2010, from http://cnx.org

Connexions. (2010c). Connexions Markup Language (CNXML) Retrieved 20 April, 2010, from http://cnx.org/aboutus/technology/cnxml

Connexions. (2010d). Create a module Retrieved 20 April, 2010, from http://cnx.org/help/authoring/createmodule

Connexions. (2010e). Frequently asked questions about Connexions Retrieved 20 April, 2010, from http://cnx.org/aboutus/faq

Elgort, I. (2007). *Using wikis as a learning tool in higher education.* Paper presented at the Australian Society for Computers in Learning in Tertiary Education ASCILITE, Singapore.

Franklin, T., & van Harmelen, M. (2007). Web 2.0 for content for learning and teaching in higher education: Franklin Consulting.

Gibson, R. K., Margolis, M., Resnick, D., & Ward, S. J. (2003). Election campaigning on WWW in the USA and UK: a comparative analysis. *Party Politics, 9*(1), 47-75.

Grosseck, G. (2009). To use or not to use web 2.0 in higher education? *Procedia - Social and Behavioral Sciences, 1*(1), 478-482.

GTP. (2005). Vision Retrieved 15 August, 2011, from http://globaltext.terry.uga.edu/vision

Hanna, A., & Metzer, J. C. (2011a, 28 March-1 April). *Beyond learning and sharing information: Voices for liberal education democracy.* Paper presented at the Global Learn Asia Pacific, Melbourne.

Hanna, A., & Metzer, J. C. (2011b, June 23-26). *What can online self-reported contributions to Wikibooks tell us about self-determination and goal-valence theories?* Paper presented at the 9th Industrial and Organisational Psychology (IOP) Conference, Brisbane.

Hylén, J. (2006). Open educational resources: Opportunities and challenges. Retrieved from www.oecd.org/dataoecd/5/47/37351085.pdf

Kennedy, G., Dalgarno, B., Bennett, S., Gray, K., Waycott, J., Judd, T., . . . Chang, R. (2009). Educating the Net Generation: A handbook of findings for practice and policy Retrieved from http://www.netgen.unimelb.edu.au/downloads/handbook/NetGenHandbookAll.pdf

McAndrew, P., Santos, A., Lane, A., Godwin, S., Okada, A., Wilson, T., . . . Webb, R. (2009). OpenLearn research report 2006-2008. Milton, Keynes, England: The Open University.

Metzer, J. C., & Hanna, A. (2011, 28 March-1 April). *The four big reasons for contribution to open educational resources.* Paper presented at the AACE Global Learn Asia Pacific, Melbourne.

MIT OpenCourseWare. (2010a). Civil and environmental engineering Retrieved 20 April, 2010, from http://ocw.mit.edu/OcwWeb/Civil-and-Environmental-Engineering/1-017Computing-and-Data-Analysis-for-Environmental-ApplicationsFall2003/CourseHome/index.htm#features

MIT OpenCourseWare. (2010b). Free online course materials Retrieved 20 April, 2010, from http://ocw.mit.edu/index.htm

MIT OpenCourseWare. (2010c). Help: Frequently Asked Questions Retrieved 20 April, 2010, from http://ocw.mit.edu/help/

MIT OpenCourseWare. (2010d). MIT OCW getting started FAQs Retrieved 20 April, 2010, from http://ocw.mit.edu/OcwWeb/web/help/faq1/index.htm

MIT OpenCourseWare. (2010e). MIT OCW site statistics Retrieved 20 April, 2010, from http://ocw.mit.edu/OcwWeb/web/about/stats/index.htm

MIT OpenCourseWare. (2010f). Science, technology, and society courses Retrieved 20 April, 2010, from http://ocw.mit.edu/OcwWeb/Science--Technology--and-Society/STS-049JSpring-2004/CourseHome/index.htm

MIT OpenCourseWare. (2010g). Why donate to MIT OCW Retrieved 20 April, 2010, from http://ocw.mit.edu/OcwWeb/web/donate/invest/index.htm?utm_source=OCW&utm_medium=banner&utm_content=HOME&utm_campaign=SPRING10campaignalt

Newendorf, K. A. (2002). *The content analysis guidebook*. London, UK: Sage Publications.

Oblinger, D. G., & Oblinger, J. L. (2005). It is age or IT: First steps toward understanding the net generation. In D. G. Oblinger & J. L. Oblinger (Eds.), *Educating the net generation* (pp. 2.1-2.20). Boulder, CO: Educase.

OERCommons. (2010a). OERCommons' 2009 survey results, part I on OER users and their demographics Retrieved 20 April, 2010, from http://www.oercommons.org/survey_results

OERCommons. (2010b). OERCommons' 2009 survey results, part II on teaching and learning Retrieved 20 April, 2010, from http://www.oercommons.org/survey_results?survey_id=teaching-learning

OERCommons. (2010c). OERCommons' 2009 survey results, part III on importance and challenges Retrieved 20 April, 2010, from http://www.oercommons.org/survey_results?survey_id=teaching-learning_2

Open Michigan. (2010). About Open.Michigan Retrieved 20 April, 2010, from https://open.umich.edu/about

Open Yale Courses OYC. (2010a). About Open Yale Courses FAQs Retrieved 20 April, 2010, from http://oyc.yale.edu/about

Open Yale Courses OYC. (2010b). Help FAQs Retrieved 20 April, 2010, from http://oyc.yale.edu/help

OpenLearning Initiative OLI. (2010a). Academic courses in OpenLearning Initiative Retrieved 20 April, 2010, from http://oli.web.cmu.edu/openlearning/forstudents/academiccourses

OpenLearning Initiative OLI. (2010b). Engineering statics course Retrieved 20 April, 2010, from http://oli.web.cmu.edu/openlearning/component/content/article/74-coursepackages/181-engineering-statics-benefits#simulations

OpenLearning Initiative OLI. (2010c). Free and open courses available for learners to access Retrieved 20 April, 2010, from http://oli.web.cmu.edu/openlearning/forstudents/freecourses

OpenLearning Initiative OLI. (2010d). Frequently asked questions about OpenLearning Initiative Retrieved 20 April, 2010, from http://oli.web.cmu.edu/openlearning/initiative/faqs

OpenLearning Initiative OLI. (2010e). Guildelines for instructors to use academic courses material Retrieved 20 April, 2010, from http://oli.web.cmu.edu/openlearning/forinstructors

OpenLearning Initiative OLI. (2010f). Guildelines for learners to use free and open courses material Retrieved 20 April, 2010, from http://oli.web.cmu.edu/openlearning/forstudents

OpenLearning Initiative OLI. (2010g). Home page Retrieved 20 April, 2010, from http://oli.web.cmu.edu/openlearning/

OpenLearning Initiative OLI. (2010h). Look inside open and free courses Retrieved 20 April, 2010, from https://oli.web.cmu.edu/jcourse/workbook/activity/page?context=b485aaad80020c690048cc3851010416&view=frameset

Polariski, P. P. (2007). *Customary law of the internet in search for a supranational cyberspace law*. Cambridge, UK: Cambridge University Press.

Ras, E., & Rech, J. (2009). Using wikis to support the Net Generation in improving knowledge acquisition in capstone projects. *Journal of Systems and Software, 82*(4), 553-562.

Richards, D. (2009). A social software: Web 2.0 approach to collaborative knowledge engineering. *Information Sciences, 179*(1), 2515-2523.

Schweitzer, E. (2008). Innovation or normalization in e-campaigning. *European Journal of Communication, 23*(4), 449-470.

Sim, J., & Wright, C. (2000). Research in health care: Concepts, designs and methods (pp. 111-122). UK: Nelson Thornes Ltd.

Stallman, R. (1999). The GNU operating system and the free software movement. In M. Stone, C. DiBona & S. Ockman (Eds.), *Open sources: Voices from the open source revolution* (1st ed., pp. 53-70). Beijing ; Sebastopol, CA: O'Reilly.

UNESCO. (2011). Communication, information and access to knowledge: Open Educational Resources Retrieved 31 August, 2011, from http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-educational-resources/

United Nations. (1948). The universal declaration of human rights Retrieved 15 May, 2011, from http://www.un.org/en/documents/udhr/

USQ OCW. (2010). Frequently asked questions about USQ OCW Retrieved 20 April, 2010, from http://ocw.usq.edu.au/mod/resource/view.php?id=105

Vukovic, B. (2009). Free and Open source software (FOSS) and OER: discussion highlights. In S. D'Antoni & C. Savage (Eds.), *Open educational resources: Conversations in cyberspace* (pp. 113-126). Paris, France: UNESCO Publishing.

Wikibooks. (2010a). Contributing FAQs help Retrieved 20 April, 2010, from http://en.wikibooks.org/wiki/Help:Contributing_FAQ#Who_can_contribute.3F

Wikibooks. (2010b). FAQs Help Retrieved 20 April, 2010, from http://en.wikibooks.org/wiki/Help:FAQ

Wikibooks. (2010c). Help:why users have to contribute? Retrieved 20 April, 2010, from http://en.wikibooks.org/wiki/Help:Why_contribute%3F

Wikibooks. (2010d). Think free and learn free Retrieved 20 April, 2010, from http://en.wikibooks.org/wiki/Main_Page

Wiley, D., & Gurrell, S. (2009). Context and catalyst: a decade of development. *Open Learning: The Journal of Open and Distance Learning, 24*(1), 11-22.

Wood, D. (in press). The design of inclusive curricula for multi-user virtual environments: A framework for developers and educators. In G. Vincenti & J. Bramam (Eds.), *ICST Transactions on e-Education and e-Learning*.

Yuan, L., MacNeill, S., & Kraan, W. (2008). *Open educational resources: Opportunities and challenges for higher education*. Paper presented at the Centre for Educational Technology and Interoperability Standards JISC CETIS. http://wiki.cetis.ac.uk/images/6/6d/OER_Briefing_Paper_CETIS_without_recommendations_with_cover_page_.pdf

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