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Exploring User Types and What Users Seek in an Open Content Based Educational Resource

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Abstract: The OpenLearn site is an example of an Open Educational Resource (OER) providing units for free study and for re-use under the Creative Commons license. The primary focus of the site is content but it also offers social tools such as forums, personal journals, presence, and videoconferencing. The content can also support interactivity such as quizzes, opportunities for reflection, and interactive diagrams. This paper discusses desirable attributes for a learning environment suited to OERs and considers OpenLearn in the light of the four types of learning focus suggested by Bransford et al (2002) namely: learner, knowledge, community and assessment centred. A study of user views of OpenLearn is reviewed using cluster analysis to identify possible user types. The needs of these user types are then considered with a focus on assessment issues and possible responses suggested in the case of OpenLearn to help bring in assessment to informal learning resources.

Introduction

This paper is about how we have managed to draw information from a diverse group of users in order to understand what at least some of those users are like, and how we might meet their needs. We are carrying out this study in the context of offering educational materials available for free within the OpenLearn initiative. The OpenLearn site, launched in October 2006, provides: access to content through a learning environment (Moodle); tools to encourage engagement and sense-making such as video-conferencing, knowledge mapping and presence (Okada 2008); downloadable content for reuse and reworking; an area for new contribution of content; and, feeds of content and activity. The content released onto the site carries a Creative Commons licence (<http://www.creativecommons.org/>) allowing non-commercial reuse with very few restrictions. The existence of open educational resources that are offering free access to educational materials and tools is encouraging a revisiting to more radical ideas as to how learning might operate in such a free environment. For example, in 1971 Ivan Illich (Illich 1971) identified four developments needed to change school-based education into a learning web to:

“enable the student to gain access to any educational resource which may help him to define and achieve his own goals:

1. Reference Services to Educational Objects — which facilitate access to things or processes used for formal learning. Some of these things can be reserved for this purpose, stored in libraries, rental agencies, laboratories, and showrooms like museums and theaters; others can be in daily use in factories, airports, or on farms, but made available to students as apprentices or on off hours.
2. Skill Exchanges — which permit persons to list their skills, the conditions under which they are willing to serve as models for others who want to learn these skills, and the addresses at which they can be reached.
3. Peer-Matching — a communications network which permits persons to describe the learning activity in which they wish to engage, in the hope of finding a partner for the inquiry.

4. Reference Services to Educators-at-Large — who can be listed in a directory giving the addresses and self-descriptions of professionals, paraprofessionals, and free-lancers, along with conditions of access to their services. Such educators, as we will see, could be chosen by polling or consulting their former clients.”

Illich (1971)

These principles and services resonate with current ideas but also seem much more realistic with current technologies; whereas Illich imagined a physical printed directory to provide reference services it is now possible to implement each part of his learning web in software. Initiatives such as the School of Everything (<http://www.schoolofeverything.com/>) and LearnHub (<http://learnhub.com/>), demonstrate how options are being explored in bringing together those who wish to teach with those who wish to learn. In reviewing trends in OERs Atkins, Seely Brown, and Hammond (2007) suggest that the development of an open participatory learning infrastructure should be the next focus for those working in the field, however whether users are ready to adopt these open systems and whether they will be eager to use the social communication tools that are being promoted is uncertain.

The OpenLearn initiative was launched in October 2006 to provide access to material derived from Open University courses in a free to use learning environment. The environment that was chosen, Moodle, offers various methods for presentation and communication, including forums and learning journals (individual blogs linked to study areas). In addition the OpenLearn site provided instant messaging and presence, video-conferencing and knowledge mapping. Together these sense-making tools (Okada 2008) allow users to create for themselves communication links and persistent artefacts that can be shared with others. These resources and tools are available alongside the content, to be used if learners choose to but they are not integrated with the units as part of designed activities. Hence it is for the individual user to decide how to use the tools and shape the way they function. For example some of the forums have become information exchange areas for current and prospective Open University students.

The OpenLearn site has attracted more than 1.7 million unique visitors in the first eighteen months since it was launched. There is no requirement on those users to identify themselves or carry out particular activities, however approximately 65,000 users have chosen to register with the site. From these registered users we can gather details of their activity and, with their permission, approach them for more information related to our research questions and understand how users view OpenLearn and its relationship to their learning.

Frameworks for Learning in a Networked Environment

Bransford et al (2000) describe four frameworks for considering learning in a networked environment. These are Learner centred, Knowledge centred, Community centred and Assessment centred. Anderson (2004) expands on these four in terms of how emerging technologies can be used to support these areas and the potential affordances of the semantic web (Tab. 1).

This framework can be used to analyse a web-based resource such as OpenLearn. The large amount of content available suggests that OpenLearn is particularly strong in the area of *knowledge* provision. This knowledge is also provided as discrete units that have been designed for study. These units are also a resource for other educators so can be re-used and adapted for other contexts under the Creative Commons license giving some of the semantic web functionality suggested in the table. *Learner* centred activity is provided for through resources such as forums, learning journals and tools such as videoconferencing and Compendium. In general these tools lie alongside the units but are not integrated with it in a formal way. Structures for *community* based activity are not formally provided for most users. However some users within the Open University community are engaging in forums relating to units within OpenLearn, which they may be studying or soon studying. A danger of this is that it gives OpenLearn a heavy Open University student ‘feel’ which might put others off the forums feeling that it may not be appropriate for them.

The last feature is a consideration of *assessment*. In this context it might be that Anderson is mainly considering assessment as part of formal online education. However, formative assessment is not only a way of providing a learning opportunity but also giving feedback, one of the characteristics of interaction. Within the context of free resources such as OpenLearn the costs of teacher based one-to-one assessment are prohibitive. Lower cost means of feedback such as quizzes and multiple choice type questions may also tend towards low level types of testing such as knowledge based domains. In order to allow the development of levels that are higher within Bloom’s taxonomy

of learning (Bloom et al., 1956) other forms of assessment may need to be considered. Within a web based context these might include peer based assessment, developing self-assessment mechanisms and more complex automated algorithms (Anderson, 2004).

“How people learn” framework (Bransford et al.)	Affordances of the current web [2004]	Affordances of the Semantic Web
Learner Centred	Capacity to support individualized and community centred learning activities	Content that changes in response to individualised and group learner models
Knowledge Centred	Direct access to vast libraries of content and learning activities organised from a variety of discipline perspectives	Agents for selecting personalizing and reusing content
Community Centred	Asynchronous and synchronous; collaborative and individual interactions in many formats	Agents for translating, reformatting, time shifting, monitoring and summarizing community interactions
Assessment Centred	Multiple time- and place-shifted opportunities for formative and summative assessment by self, peers, and teachers	Agents for assessing, critiquing and providing “just in time feedback”.

Source: Anderson T (2004)

Table 1: Affordances of the network environment and the attributes of “How people learn”

Method to investigate user experience

To explore users’ experience of and potential use of OpenLearn an email was sent to 6196 registered users who had declared that they were willing to participate in the research. This email contained a link to an online questionnaire. Only users who had visited the site within the preceding six weeks of mailing were identified as potential participants for the survey (although many of these would have visited the site prior to this period). This was to ensure that they had a recent memory of their use and hence increase the validity of their reporting.

Two types of questionnaire were created based on usage times as registered users. Usage times were calculated by examining logs of OpenLearn page use for each individual registrant since the launch of OpenLearn. One group, low users, were defined as those who had spent 30 minutes or less as registered users on the site, and the other, high users, more than 30 minutes as registered users on the site. The questionnaire directed at low users was shorter in length as low users may have had a more limited experience of OpenLearn and may be less likely to invest the time to fill in a longer questionnaire. It was also felt that they would have had insufficient experience to make valid judgments on some of the questions. High users were asked more detail about their experience in working with units. In other respects the questionnaires were as near identical as possible to allow a comparison of low and high users.

Four batches of survey requests were sent out over a six month period. With each batch all potential users that fell within the six week usage constraint were contacted. A reminder was sent after two weeks of the sending date if there had been no reply. No third reminder was sent to avoid overloading the recipients with unwanted email. In all 2011 questionnaires were completed which gave a return rate of 32.5%.

This paper focuses on the answers given relating to the intended use of OpenLearn and how important users would consider a list of suggested facilities for OpenLearn (some of which were available on OpenLearn to various degrees

and some not). The aim of this analysis was to get an insight into users' needs and to explore the types of user that OpenLearn might attract.

(Tab. 2) shows the average scores given to a question asking the students to rate, using a four point Likert scale (1 representing a low rating and 4 a high rating) a list of 10 features based on the question 'In terms of your own potential use of OpenLearn how important would you consider the following features?'. The mean scores given were calculated for low and high users and the 10 features ranked in descending order according to their mean scores. It was clear that the mean scores and ranks for low and high users were very close and often identical. Indeed the first seven ranks are the same for both groups.

It is also of note that the responses to many of the questions within the questionnaire were very close for low and high users. A possible explanation for this is that registrants might be more likely to be interested in more serious study many having reached OpenLearn from an Open University website link (low – 50.8%, high - 59.5%) and many having indicated some connection with the Open University (e.g. potential, current or previous students).

In interpreting these scales it must be borne in mind that although a mean score might be comparatively low it does not preclude a smaller sub-group who think the attribute as important. It is however revealing that a large choice of content is considered the most important feature of OpenLearn and that interacting with other learners is low on this list.

The second most highly scored option was 'to have ways to test and assess my learning'. This is a feature not currently available to a large degree within OpenLearn and perhaps points to the need for signposting, self-assessment and feedback. It may also point to the desire for more formal recognition of achievement.

Third on the list is the desire for interactive content – which is designated within the question using the relatively simple examples of quizzes and interactive diagrams. It is clear that content itself is perceived by users as an important feature. Media aspects come lower on the list but are above the middle scoring point of 2.5.

In order to explore the relationships between these variables and to identify any possible types of user a cluster analysis was performed. Using SPSS™ a correlation matrix was constructed for the ten options. This allowed the measurement of 'proximity' between variables, that is how the variables were correlated to each other based on a measure of Pearson's coefficient of correlation. Using Elementary Linkage Analysis (ELA) a 'typal' method developed by McQuitty (1957) and illustrated by Philip et al. (1975) a cluster analysis was performed on this matrix. The method is relatively simple to employ and can be performed manually by following a series of steps on the matrix. This method was employed on both the low and high user correlation matrices and the results are displayed in (Fig. 1) for low users and (Fig. 2) for high users. The options have been listed from 1 to 10 in order of the relevant score rankings and the coefficients of correlation as labels on the arrows connecting the option variables. The value of the coefficient indicates the strength of association between the variables with values of 0.7 or more taken as high, and 0.4 to 0.6 as medium. All associations were statistically significant at $\alpha = 0.01$ or lower.

In an examination of high users two clusters were identified. The first cluster contained a combination of media related options and socially linked options, perhaps thinking of these as sub-groups of the cluster. The second cluster was interpreted as being based on more traditional learning aspects and included the roles of interactive content, the presence of experts, ways to test and assess, and a large choice of content. The second cluster represents the top four scored options in (Tab. 2).

A similar result was obtained for low users with two discrete clusters. Once again the strongest cluster was that which contained the media and social aspects, and the second cluster containing those elements that are often associated with traditional education. Although this was the weaker cluster in terms of the correlations between the variables it contained the dominant rankings in terms of variable scores.

In seeking to label these clusters in terms of the response of individuals it is clear that there might be different levels of importance attached to certain features. This view is supported by the analysis of other questions not reported here.

Q. In terms of your own potential use of OpenLearn how important would you consider the following features?

	Low Users (mean score) n = 1024	Rank (low)	High Users (mean score) n = 987	Rank (high)
A large choice of content	3.5	1	3.6	1
To have ways to test and assess my learning	3.3	2	3.4	2
Interactive content e.g. quizzes, interactive diagrams etc	3.1	3	3.1	3
Question and answer sessions with experts	3.1	3	3.1	3
Images and graphics	3	5	3	5
Video Clips	2.9	6	2.9	6
News items	2.8	7	2.8	7
Audio and podcasts	2.7	8	2.7	8
Facilities to create personal space	2.2	10	2.3	9
To be able to interact with other learners	2.5	9	2.2	10

NOTES: Low Users defined as less than 30 minutes on the site as registered users, High Users as more than 30 minutes on the site as registered users. All users in the survey were recent visitors in that they had used the site within the previous six weeks of contact.

The sample sizes represent the total number of received questionnaires NOT the number of responders to each of the options – some would not respond to any particular question – however this never exceeded 7.5% of the questionnaires

Table 2: Relative importance based on mean scores for various suggested attributes for OpenLearn functionality

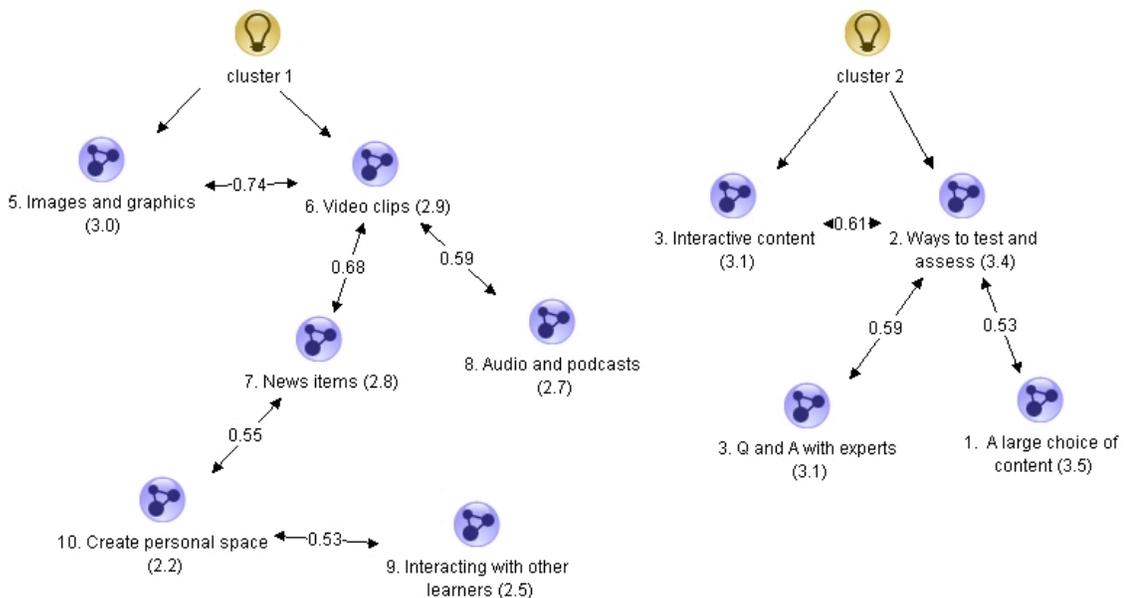


Figure 1: Clusters Derived from Low Users (numbered by ranking with scores in brackets and correlation coefficients with arrows)

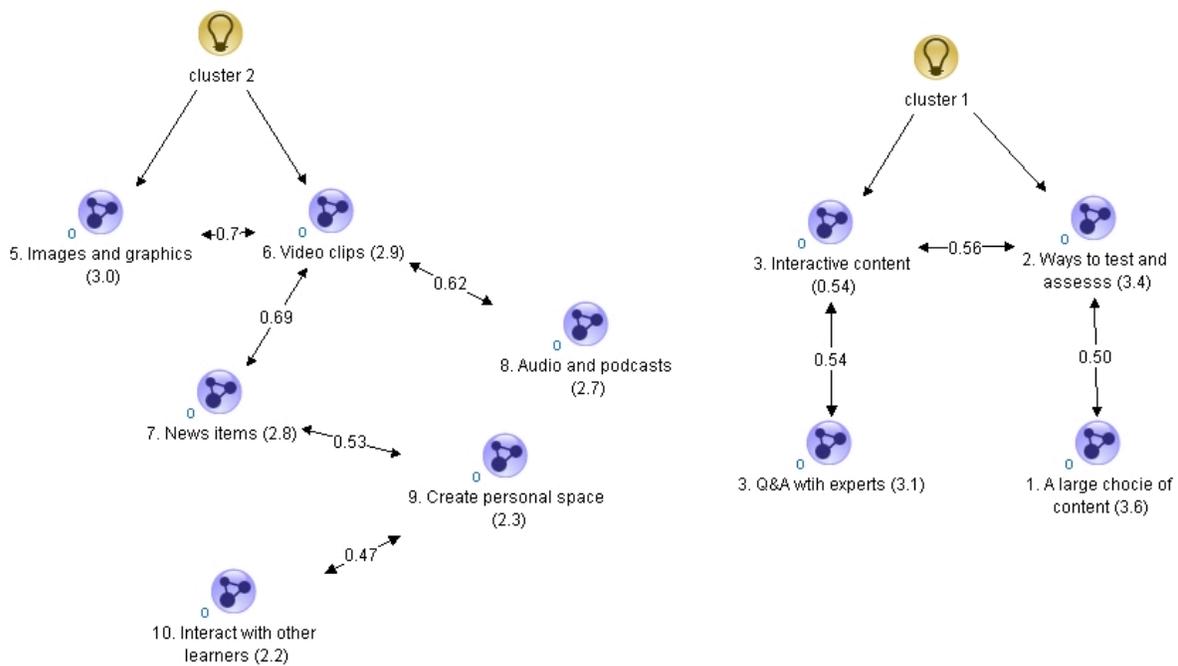


Figure 2: Clusters Derived from High Users (numbered by ranking with scores in brackets and correlation coefficients with arrows)

Discussion

The implications of the research into user types are considered here in particular in relation to assessment; a feature that is largely absent from OpenLearn yet desired by many users. Cluster 1 for both the high- and low-user data indicates that there is a set of users who are interested in communication and use of non-text media. Cluster 2 on the other hand brings together aspects that can be linked to relatively formal assessment processes and suggest the possibility of supporting links from open education to formal education. The clusters were stereotyped as “social learners” (cluster 1) and “volunteer students” (cluster 2) to emphasise the connections in the first case with features associated with social networking, and in the second with the facilities and motivation we might normally associate with registered students. We can imagine ways in which each of these user types can be supported more fully by the open education movement but it is not yet clear whether the demands are in tension and contradictory or can each be accommodated.

Some good examples of support for “volunteer students” can be identified in our existing site and other enhancements are planned including:

1. Greater use of *in-built exercises* that make the learner act like a student: e.g. learners are asked to produce a 250 word essay on their attitude towards arts; many of them do so even to the extent of including word counts for their unmarked and completely voluntary submissions.
2. Building up an *interlinking of content and assessment*: e.g. the development of key skills within a framework forms one unit, but linked to that are six units that support constructing portfolios for different skills areas. If learners then carry out each of those units they will have performed a substantial amount of work, equivalent to approximately 300 hours of study. This model is strongest in working with

collaborating organisations, however by offering the resources on an open basis anyone could develop their own portfolio.

3. Content *matched to accreditation*: e.g. placing all the content of a science course online. In its original form the course combined television broadcast with study, in this new format all content is online and only assessment will be offered. This is a new venture for the Open University but is also being explored by other organisations such as the Open University of the Netherlands and Athabasca University in Canada.

The enhancements for greater assessment structures are mirrored by ways to support the more social learners:

1. *Communication support*: e.g. feeding the activity that takes place within OpenLearn units and University courses through to social networking sites such as Facebook.
2. Developing *persistent objects* that represent individual users: e.g. views of content through recorded video blogs or knowledge maps. The retained actions of the learner then allow other learners to vicariously gain from their work. Previous studies (Cox et al. 1999) warn though that activities may need to be structured deliberately to generate value for such vicarious learners.
3. Reflecting back usage to allow *self-certification*: e.g. the learning environment holds logged data on the users interactions with content and forums. This can be used to provide printable records in the form of a certificate that can then be used to show the user and others how much they have engaged with the content. The value placed on these is entirely in the hands of the user and implies a self-formalisation of their approach to the content rather than an accredited validation.

These activities and examples indicate possible areas that we might further develop for OpenLearn, or can be created by others using OERs such as OpenLearn as a base for content. Our research indicates that we need to be wary of ignoring user needs by developing sites that offer no links to assessment and accreditation, however at the same time there are users who seek stronger communication structures. Equally we need to avoid promoting social-networking as suiting everyone; while content may no longer be “king” it remains important as a way to provide structure and also to establish a gathering point for users. More content had the highest ranking from the users we surveyed, and it is also apparent from analysis of search terms used that the subject content provides the main reason for people to arrive at the OpenLearn site.

Conclusion

Open Educational Resources provide a test-bed that acts “in the wild” (Hutchins, 1995) with free access and connectivity. An examination of what users wish to see in OpenLearn stresses the value attached to the content that OpenLearn already provides but clearly demonstrates the desire for some means of knowing how users are performing as assessment. The challenge is to provide ways in which both informal and maybe even formal assessment can be provided. Users often need to know how they are doing and this need has been demonstrated in the data presented here and in qualitative feedback from users. Formative assessment allowing for reflection can be a powerful tool for learning and it remains a challenge to provide that within an Open Learning environment.

A cluster analysis has suggested that there are different characteristics of users, some more driven toward social aspects than others, although more traditional aspects of education dominate the rankings in terms of user needs. Understanding users’ needs and using the guidance of frameworks for learning such as those suggested by Bransford et al (2000) can allow us to identify one or more areas for development related to Learner, Content, Community and Assessment Centred learning. Providing assessment as a way of allowing students to reflect and learn remains a challenge for OpenLearn and Open Educational Resources.

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