
Use and Users of Digital Resources

A Focus on Undergraduate Education in the Humanities and Social Sciences^{*}

GOAL 3B: SITE OWNERS AND USER RESEARCHERS MEETING

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April 5, 2006

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^{*} This work was made possible by generous funding from the William and Flora Hewlett Foundation and the Andrew W. Mellon Foundation. Additional support was provided by the Hewlett-Packard Company, the Center for Information Technology Research in the Interest of Society (CITRIS), the California Digital Library (CDL), and the Vice Chancellor of Research, UC Berkeley.

Please cite as:

Harley, Diane, et al. *Use and Users of Digital Resources: A Focus on Undergraduate Education in the Humanities and Social Sciences*. Center for Studies in Higher Education, UC Berkeley (April 2006)

GOAL 3B: SITE OWNERS AND USER RESEARCHERS MEETING

Summary of Proceedings: May 23–24, 2005

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Introduction and Overview

On May 23–24, 2005, the Center for Studies in Higher Education convened a meeting of seventeen experts for a discussion entitled “Online Educational Resources: Why Study Users?” The meeting was part of the UC Berkeley “Use of Digital Resources in Undergraduate Education” study. A complete agenda for the meeting and a list of participants can be found in Appendices N and O.

The format of the meeting was relatively informal and flexible to maximize discussion. Our discussions covered four broad topics:

- Codifying content and contexts
- What do we want to know about users? How do we find out?
- Users, user demand, and sustainability
- What are the larger research questions and agendas that need to be addressed?

The participants represented a variety of perspectives in the field of online educational resources. Their collective expertise included production and delivery of online educational resources, delivery of continuing education, user research, and foundation funding. The following organizations were represented:

- Curricula: CMU OLI, Connexions, MERLOT, UC Irvine, MIT
- Digital Libraries: JSTOR/ARTstor, NSDL
- Tools and Reuse: Carnegie Foundation, MIT, IKSME
- Foundation and Society perspectives: ACLS, Hewlett Foundation

The meeting, organized by Diane Harley, Vijay Kumar, and Gary Matkin, was born out of our collective interest in how we might clarify communication about users within the somewhat amorphous field of online education resources. Our purpose was to explore a number of questions. Most broadly, what do we know about users of online educational resources (OER)? What more do we need to know, and how do we find out? What, exactly, do we mean by online educational resources? Is it content, a course, or a certification? Is it open or restricted, and do users even know the difference? We asked from the start what we mean by users. The meeting also served as an opportunity to present for critique preliminary findings from the CSHE faculty survey (see page 4-20) and interviews of OER site providers (see page 6-3).

Regarding terminology, we intentionally focused on *Online Educational Resources* (OER) broadly defined, because we know from our work that most users, and even some producers, do not actually make the distinction in practice between open-access and proprietary, restricted, or licensed sources (e.g. proprietary textbooks and databases that are licensed are used in combination with free resources found on the Web through Google). But because so many of

the participants are specifically involved with “*open*” *online education resources* (OOER), there is potential for confusion. We attempt to maintain the distinction throughout this summary.

Proceedings were recorded and transcribed. The following report represents our attempt to summarize our rich discussions. It is not meant to be verbatim, nor presumptive of any one perspective or position, but rather a synthesis of the main ideas and disagreements that emerged, and the areas that were noted to be worthy of further exploration. It is a merging of many voices.

Section One: The challenge of creating common frameworks for studying users

A. Finding a common framework: codifying content and contexts

The meeting began with these fundamental questions:

- What do developers know about the demographics, behavior, and motivations of users and non-users of online educational resources? How do they find out? What do they want to know?
- How does the variety of online educational content available (canned curricula, digital libraries, media sites, electronic textbooks, learning object repositories, etc.) and the infinite number of ways users can combine resources (e.g., individual digital objects and canned curricula; mixture of free and proprietary content; comprehensive and niche resources) influence our ability to make sense of the current and future landscape of user behavior and motivation?
- Is it important for content providers to distinguish among various educational audiences and contexts (e.g., community college, R1s, AP courses, fully online versus on-campus hybrid, international markets, liberal arts, vocational, etc.)?
- How are localization and translation of open content to be handled? Who are the mediators? How can we help users access and share pedagogical knowledge and innovations to better use OER?

Questions about user behavior are tightly linked to questions of policy and planning. Descriptions provided by various initiatives about what they know or don't know about their users clarified that both information about users and key terms and methods for studying use vary greatly from one OER project to the next. Some projects have in-depth knowledge about some of their users but not about others (e.g. Carnegie Mellon University's Online Learning Initiative and MIT OCW), while other projects have little systematic knowledge about any of their users. The lack of a clear approach to studying users makes it difficult to coordinate knowledge about audiences, uses, sustainability models, or strategic planning among OER projects. To answer such questions and make OER useful to varied users and communities, we need a common framework for talking about and studying OER users.

1. Barriers to systematic understanding of users: More attention has been paid to supply than to demand for OER

A common assumption among participants representing open OER (OOER) initiatives is that a large quantity of OOER production and dissemination has been driven by the excitement of the mission – characterized by several participants as a “vision” or “campaign” with, perhaps, an

“evangelistic” bent. The site owners who participated in the meeting also acknowledged that they often have limited knowledge about who is using the content and why, and some are coming to realize that many OER, whether open or not, are not being used as widely as anticipated. The “build it and they will come” approach of OER initiatives, especially those born in academic institutions, has in many ways precluded systematic investigations of user behavior and demand.

2. Codifying categories of content and users

A major challenge identified by the meeting was creating a common framework to talk about various users and various kinds of OER. As one participant put it, “The trouble we have in defining our market or defining the need or defining our users is that we don’t even have a common semantic about what we mean.” Based on general agreement that we should be more precise about the categories of user study, the meeting posed the question of how to go about codifying the content and context of OER as a first step in coordinating among projects.

Participants all underlined the importance of having clear categories to break down large terms like “digital resource” and “user.” For instance, before deciding to study “faculty use,” a researcher needs to decide what sort of OER to ask about and what sort of faculty to study – from what departments and institutions, and with what educational aims. Only with a precise vocabulary and a shared understanding can user studies be applied effectively in diverse contexts. As one participant put it, “Just to be able to qualify and inform what should be the kinds of questions that you’d ask of large initiatives I think is a worthwhile purpose.” Participants hoped that such a codified framework could help make sense of the OER endeavor as a whole: “Some sort of structure or analytical framework through which research could be judged, research agendas can be formed, proposals can be evaluated, individual business plans could be assessed, and so forth.”

a. Differentiate among types of OER content

The category of OER needs to be refined. Are we talking about sophisticated, carefully crafted curricula such as CMU OLI, syllabi and associated materials such as MIT’s OCW, modular learning objects such as MERLOT, a repository that can be added to in chunks as with Connexions at Rice, or a digital library such as MOAC or RLG Cultural Materials?

Participants began to elucidate the differences among OER products and sites. Some sites are significantly larger and broader in scope than others. Some sites offer referatory or portal services on top of content, and one participant reminded us to differentiate between “product” and “service,” where the former is the online content, and the latter is the repository or portal. Then there are multiple sites that provide “online courses.” While some of these course sites offer online instruction that stands alone, others offer online materials to supplement a course that takes place in a traditional classroom. Resources need to be differentiated according to “the extent to which the enactment of instruction is embedded in the resource itself,” as one participant suggested. Curricular sites need to be distinguished from the multitude of digital library and archival collections that house massive amounts of “raw” digital resources, as well as from commercial media sites that offer a variety of media types from news stories to digital video. Aware of these and many other differences among OER sites, participants agreed that we should not over-generalize from a high-profile OER site like MIT’s OCW. OCW’s success

does offer a powerful vision of possibilities, but their precise profile is not necessarily what every user wants and what every OER site should duplicate.

b. Differentiate among OER users and the contexts in which OER can be potentially used

Students vs. faculty vs. self-learners

Participants throughout emphasized the importance of distinguishing among student users, faculty users, and unaffiliated independent users, or self-learners. Because these groups use OER materials in very different ways, developing unique strategies for site and content design to meet those user needs may be essential for success. CMU OLI, for instance, designs materials that can, in principle, be used by everyone, but they often present the content in different forums that suit each unique target audience. (See page 7-17 for a more in-depth discussion about informal users.)

Moreover, many, if not most, open-access OER sites are used by learners in other countries. Participants with global audiences explained that working with other countries involves adapting to a diversity of learning styles and objectives, as well as navigating the complexities of cultural and linguistic barriers. As one participant put it, adaptation means more than just translation, or even making relevant examples available. It also means that we have to understand the preconceptions, misconceptions, and previous learning foundations of the students in those countries.

Type of institution

Participants noted that formal academic users (students or faculty) differ based on the type of institution in which they work or study. Users from R1 universities, liberal arts colleges, community colleges, vocational schools, or high schools are likely to have differing objectives and access to technology. For instance, community college students (who may rely on computer labs more than a personal computer) often do not have the same level of access to technology as would students from a liberal arts college (who may have a personal laptop included in their tuition). Other types of users may not be in formal educational settings at all, but in workplaces, or learning from home.

Users with different skill levels and learning objectives

It is fruitful to differentiate the reasons that people use OER. Some seek a particular digital object for a specific purpose; some seek a completely stand-alone course; some seek supplemental material for a research project, assignment, or their own course; some seek to create their own online course or resource site; and others may just be engaged in lifelong learning.

Different types of users also have different skill levels and technological sophistication. If technological sophistication corresponds to age, participants suggested that the fraction of sophisticated users will only increase. Indeed, younger students may be comfortable with technologies, like instant messaging, that university instructors and OER sites have barely begun to incorporate in their teaching methods. But the difference in skill level and technical sophistication is not as simple as age and can also be attributed to factors such as discipline, industry, and socioeconomic status. Not knowing that a resource exists is just as much of a barrier as not being sufficiently skilled to use it. This CSHE study, for instance, found that

many UC faculty simply do not know about the wide variety of restricted digital resources available to them through institutional licenses.

Non-users

One key group to study is individuals who do not currently use OER, especially if one aims to increase OER's audience. Why don't certain faculty, for instance, incorporate OER into their teaching? This research project was particularly interested in why resources weren't being used, and Diane Harley suggested that understanding non-users presents an opportunity. If we better understood the myriad reasons for non-use, including social and economic barriers, perhaps we could redesign OER in ways that would be useful (and that would potentially counteract existing disincentives and barriers).

Category overlaps

Finally, it is important to remember that user categories will inevitably overlap. Some users are also producers who create and contribute OER material of their own to existing sites. Self-learners encompass a vast and demographically diverse population who embark on varied types of independent research. Some users from one institution (for instance, a graduate school of education) may seek OER to be used in a different institutional context (K-12 classrooms). How do site producers define the user or user community, and classify users into categories, when communities can be so fluid and difficult to define?

B. Codify terms and methods for studying users

This session, which provided an overview of CSHE interviews with site owners on OER user studies, referenced the following questions:

- Where are the gaps in current data about users, and how might those gaps be filled? What are the best methods to employ for strategic planning purposes? Should/can OER projects be thinking about common questions, metrics, and approaches to understanding users?
- What are consequences, if any, of poor sampling and of application of user results to the wrong questions? Are there consequences to not doing user demand/market analyses before building content?
- What are the best ways to leverage activities across multiple projects?

Shannon Lawrence presented her work interviewing OER site owners (see Goal 3A). Her interviews, and the ensuing discussion, highlighted the problem with the current state of user studies: while many OER sites may use similar tools for collecting data (weblogs, online surveys, focus groups/interviews), the questions asked and the precise metrics used are unclear and inconsistent.

There was some concern expressed that sites may not even know about the range of possible evaluation tools they could use, and how to use them. At the National Science Digital Library (NSDL),¹¹¹ Flora McMartin found that the six digital collections under study used almost completely different metrics to describe themselves and their use. Similarly, Shannon Lawrence,

¹¹¹ <http://nsdl.org>

during her initial discussions with site providers for this study, found widely differing notions of what it means to “interview” users – it can mean conducting a focus group, a survey, an informal conversation, or a usability test.

In addition to codifying the categories of OER content and OER users, participants concluded that it is also important to agree upon some common questions and methods for conducting user studies. A discussion of research design followed: some of the better-funded sites have hired specialists to collect and analyze their user data, but few others can afford to follow suit, and are left to analyze their own data without necessarily having the professional expertise to do so rigorously.

Participants did not all agree that a professional-level study and analysis is always warranted. As Diane Harley asked, “Do we really do anything with this high-end, expensive evaluation work that is any better than what we would do with the informal kind of studies?” Informal conversations with users, it was argued, may be useful, depending on the site’s objectives and constraints. Several of the site providers interviewed found that in-depth feedback from individual users was more valuable than large, comprehensive surveys. This type of informal user study may be especially useful during the early stages of development, when a site is determining direction, and later when usability issues of existing tools might be needed. It may be less useful if decisions are being made about investments in new and expensive initiatives. Participants concurred that it would be helpful to clarify which different types of studies – degree of formality, scale, rigor of data analysis – were best suited to particular objectives and particular contexts.

1. Clarify the purpose and objectives of user studies

Throughout the discussion of distinctions among types of content, types of users, and types of study, participants returned to an important consideration: a site first needs to understand its objectives to best select the categories it wishes to study. One participant noted:

In order to get a handle on the impact of use and whether outcomes are being achieved, we need to describe the problem we’re trying to solve. Because actually, how I measure success, and even how I continue to do product development and dissemination, has everything to do with “what’s the problem I’m trying to solve?”

While there are no hard and fast rules about which methods should be used, there was significant discussion about the need to identify the objective of the OER project and to design studies to improve the probability of meeting that objective. The metric a site chooses for “the atomic unit of the user” – institutional affiliation, desired learning outcome, skill level – depends on what that site wishes to learn from its findings. Conversations among different site producers revealed that different studies are appropriate for different OER projects. For example, it is important to consider whether a project is under pressure to adapt to user demand or has the financial resources to create content regardless of user demand or needs. Sites that follow a subscription model may choose to study only visitors that use the materials regularly and frequently, while a site such as Connexions tries to understand and serve every visitor.

In her interviews with site producers, Shannon Lawrence found that many sites collect data without knowing what they want to learn from it. That is, site producers had difficulty

expressing the connection between the data collected and its usefulness, and they often lacked a framework for analyzing data. This fact seemed to highlight the crux of the issue: the problem may be not only in collecting the data but in analyzing it. In fact, several site providers openly admitted to collecting data with no intention of immediately analyzing it, either because they did not have the resources/funding, or because they were unclear about what possible questions it could answer. Some debate ensued in the discussion following her presentation and throughout the meeting. Some shared the concern that few sites have thought through what data they really value and why, while others felt that it was desirable to collect as much data as possible even lacking a clear objective.¹¹²

2. Why study users? Illustrative cases and goals

Participants stated a wide variety of goals for user studies, ranging from improving producers' decision-making process, to increasing the value of the broader OER endeavor. The following three site producers went into some detail about the particular ways in which their user study impacted OER project design.

Example 1: Carnegie Mellon University Open Learning Initiative (Candace Thille)

User studies can improve academic value, pedagogic quality, and educational outcomes.

OLI is driven by a mission to improve educational pedagogy through cutting-edge computerized learning. Because OLI's goal is to improve pedagogy rather than, for instance, to reach as many people as possible or to encourage learning communities, their studies focus on learning outcomes and especially on professional development for instructors. They differentiate between two types of users: students/self-learners who do not otherwise have access to high-quality post-secondary education, and smaller institutions of higher learning that wish to incorporate OLI's course content and teaching methods. OLI designs their offerings differently for these two distinct audiences; for instance, for the latter they offer coaching and professional mentoring. They also study these two groups of users differently. While they communicate with their faculty and institutional partners through informal conversation, they study learners by gathering data about individual usage practices, learning styles, and performance, and improve their materials accordingly. They do not, however, collect data about user identities such as age, field of study, or institutional affiliation. They do try to understand the CMU faculty who contribute to the project: what keeps them motivated and how to encourage them to continue contributing high-quality material. In sum, OLI's efforts at user study are geared to maintaining a high-quality model curriculum. Some of that curriculum has spun into a commercial venture, Carnegie Learning, but the business side does not affect the ongoing research and development within OLI itself.

¹¹² It was suggested by one participant that a better approach in talking to site producers about user studies would be to ask which metrics best answer their most pressing questions. Follow-up interviews in which this new set of questions was posed resulted in an equal amount of confusion. Making the connection between important questions in user studies and the metrics that answer those questions is beyond the capacity of most evaluations at this stage in OER development. The exception to this experience may be those sites that have clear objectives tied to *measurable* goals. Also, those sites that invest in professional evaluation are more likely to have a comprehensive evaluation plan.

Example 2: Ithaka/JSTOR/ARTstor (Roger Schonfeld)

User studies can improve usefulness to specific, known users and can inform choices about content and tools.

ARTstor faced some choices about how to design their offerings and where to invest their limited resources: in improving the quality of an individual image, in offering more images, or in providing robust subject indexing and metadata. So they turned to a needs analysis to address these issues and developed a formal survey that asked “what do users want?” Because ARTstor aims to appeal to a broad range of faculty, the survey was administered to a wide variety of disciplines. And indeed, although art historians preferred a higher image quality, the survey found that the majority of other faculty were more interested in having a very good cataloging and search system. The formal market study confirmed a critical issue that ARTstor staff had long suspected. Having these results in hand helped to give ARTstor the confidence to devote further resources to its metadata, including the creation of robust “crosswalks” across collections allowing for the best possible user experience.

Example 3: University of California, Irvine, Distance Learning Center (Gary Matkin)

User studies can improve economic sustainability.

The Distance Learning Center studies its users to create a product that will draw partners to commercialize it. They engage in market research and product development primarily by trying different prototypes. In Gary Matkin’s words, “One of the things we do is we build a prototype product and test it on an audience, and see if they like it.” Rather than engage in a formal needs analysis, they rely on professionals and experts who understand the field or industry to identify areas of need. Thus, the Distance Learning Center puts resources into product development first, and lets the market tell them whether the product is viable and attractive. Gary finds this approach more cost-effective in their case, but, as another participant noted, such an approach depends on the cost per unit of production. Gary acknowledged that other types of OER products would likely require too much initial investment, and hence would warrant greater initial study.

Based on these and other conversations, three goals for user studies emerged:

a. Goal: Improve OER content and functionality

As all three examples show in their own way, one key goal of any user study is to enable an OER to be responsive to various audiences’ needs. Steps to this goal can include changing content, adding software functionality, refining the learning experience, and/or fixing any back-end problems.

b. Goal: Assess OER value

Value came up repeatedly in discussions about the goal of user studies: participants hoped that understanding use would help assess the true value of OER. To answer looming questions such as, “Do we keep going...do we keep putting money into this...is there value?,” site producers need to know if people are using OER. A more precise understanding of users helps move considerations of value from the abstract to the tangible. Participants cited instances where an OER that seemed valuable because of its high-quality curriculum ends up having very little value for an audience, whether for lack of interest in the content as packaged, access to basic technology/usability, or similarity to existing OER. User studies, thus, can provide a

perspective on how much a particular OER realizes its value for its users. (The value of user studies and their relationship to sustainability is discussed in more detail in Section 2.)

c. Goal: Strategic planning

Another key purpose of studying users is to inform strategic planning. Is there an audience? And who is the audience for whom a particular product is most valuable? By realistically assessing a site's value to users, user studies can help producers gauge whether their vision of the site is on the right track, what improvements they need to make to further their objectives, and whether they should adjust those objectives. User studies can also create a feedback loop between funders and site producers by giving funders a way to know whether a particular grant is meeting its objective.

While few OER sites currently engage in the sort of strategic planning that Roger Schonfeld described above for ARTstor, participants imagined various scenarios where user studies could productively inform strategic decisions about future development and resource investment. For instance, if a site realizes it is primarily used by self-learners, it could design new tools that would be of interest to that audience. User studies could also help OER producers make difficult strategic choices: a site may choose to narrow its profile to serve only the key audience that most frequently visits it. Finally, strategic planning can help a site think about the lifecycle of its offerings and how to respond to trends in technology and usage patterns. Aware of the rapid nature of technological change, participants were concerned about how to continue to produce content that is useful for varying communities whose needs and skills change over time.

Not all participants were equally convinced that user studies would actually help OER be more responsive to its users. OER suppliers may be so content-driven that, as one participant put it, "It doesn't matter what we say about user studies, and what information, they're still going to be producing these repositories just willy nilly...." Another participant pointed out that because OER use is such a moving target, the conclusions from today's studies may be very poor strategic guides for the future.

Similarly, not all participants were equally convinced that strategic planning should be the main objective for user study in the first place. Instead, OER sites could conceive their user studies as academic rather than marketing endeavors. After all, as one participant phrased it, educational projects such as OER have never been the sort to tailor themselves to "well-targeted, well-defined user demands."

3. What methods are best, in what contexts?

The discussion then addressed some practicalities of studying users: what are the obstacles, technical and conceptual, facing user studies? And what are some potential solutions and directions for future research?

Obstacles to research quality and rigor: bias, the unknowable, and lack of replicability

Bias

Good social science research demands time and professional expertise, and most organizations do not have the resources or skilled personnel to conduct rigorous research (or even more casual research in some cases). As a result, studies can be poorly designed and executed (e.g., ubiquitous lack of random sampling, lack of assessing impact of small response rates, lack of knowledge of existing research). In particular, participants pointed out that user studies are prone to bias if conducted by the site's own staff, who are very invested in the success of their particular site. Several participants discussed the ways in which user study risks becoming a "self-fulfilling prophecy" that serves to validate the producers' pre-existing sense of the site's value. Another participant pointed out that user studies tend to favor relationships and products that already exist: it is much easier to ask a site's existing users about the content they already use than to research non-users and explore what other content users would use if it existed. Techniques for measuring site usage also may have bias; for example, it would be misleading to measure hits right after a site has launched a new advertising campaign. Being aware of these potential biases, however, participants could imagine finding ways to correct for them, or at least acknowledge them, and still produce informative studies.

The fuzzy unknown

A major stumbling block to collecting good data is the difficulty of understanding the full range of an OER site's users. As participants shared their actual knowledge and conjectured about who uses their site and why, it became clear that most sites freely available on the Web get hits from a phenomenal range of users with very different goals and motivations. Participants cited the international community and K-12 teachers and students as examples. It is especially difficult to study users who do not register and who do not log in from recognizable institutions. Many open-access OER sites, in particular, do not even have a registration option, leaving few avenues open for understanding users at all. Sites such as OLI do not collect IP addresses and can rely only on anecdotal and random email messages. A site such as MERLOT is able to track usage only from IP addresses provided by their campus partners and is thus unable to learn about the larger fraction of off-campus use. (The challenges presented by anonymous, unaffiliated visitors are explored in greater depth below, in the section dealing with unintended use and users.)

Even when it comes to known users, identifying what to measure is sometimes problematic. How much use qualifies a site visitor as a "user?" How do we define an "active" user? As one participant inquired, "Is 'active' somebody who comes on once a year and spends two or three hours looking for materials? Is it somebody who is there once a week?"

Participants also noted technical and cultural barriers to studying users, especially via log analysis studies, which can be fraught with problems (e.g., see Goal 2B, page 5-2), and when studying international users. When it comes to formal and informal surveys, some participants suspect that what users claim in surveys is not always what they do or need in practice. This suspicion compounds the significant difficulty of working with exceptionally low response rates and biased samples when interpreting survey data culled from an on-site survey.

Replicability

Finally, many participants were concerned about the fact that even a well-designed study may be difficult to apply to other sites or types of users due to the variation in producers, institutions, and users. Indeed, comparing use among projects is one of the greatest challenges facing user studies. Can a study about faculty at the University of Wisconsin tell us anything about faculty in California community colleges? A very broad study may not shed light on the day-to-day decisions of a particular OER site, while a very specific study may not be applicable to other contexts. Other participants felt, more optimistically, that any user study is a building block that contributes knowledge about the big picture. For example, one participant described several ways in which the divergence among studies still teaches us a great deal about segmentation among user groups.

4. Recommendations

a. Gather more and better user data

Participants brainstormed ways to collect more useful information from both registered and non-registered users. MERLOT, for instance, will soon begin asking registered users questions that differentiate them according to the categories outlined above, such as institutional affiliation. Users could also be asked to describe what they have done with the OER material they found, and to provide greater detail about their needs and interests. Ideas were exchanged about new technologies that could track a single user throughout the site, combining his or her registration information, feedback, and transactions into one profile. A cookie is one solution, or perhaps an identifying passport that tracks a user across multiple OER sites. Participants did agree, however, that all such data-gathering must be voluntary, to respect users' privacy, especially in cases where there is fear of politically motivated surveillance.

b. Share knowledge

Participants underscored the importance of being more aware of one another's projects. Understanding the existing array of OER projects can help producers eliminate duplication, position a site to address unmet needs, and identify potential partners with complementary offerings. Knowing about other projects would also help producers expand their sense of what is possible and what is valuable.

Additionally, participants would like to see usage statistics shared across projects, so that user data can be combined and analyzed more broadly. Some conceded, however, that projects which compete for funds may not be willing to share their user data freely, especially data that was expensive to collect and is considered proprietary.

A different discussion underscored the importance of knowing about existing studies: while trying to rectify the lack of sufficient user information, we should not overlook the fact that a great deal of research has been done on many of the relevant topics. Some time spent researching existing literature and other user studies would ensure that new studies do not just reinvent the wheel. As one participant put it, "An hour in the library is worth twenty in the lab." Similarly, some participants noted that foundations already provide a sort of "marketing" study when they articulate their funding priorities – they have already done the work of speaking to relevant constituencies to assess and prioritize needs.

c. Create a feedback loop

In response to concerns about whether it is possible to generalize from user studies, many participants pointed out that the most effective general categories and questions are those that emerge gradually over the course of many studies, in a continual back-and-forth between the micro- and macro-level. All relevant variables of study – mission, users, producers, sustainability – are interwoven and need to be put together piece by piece, which is best accomplished by an iterative analysis.

d. Develop a community approach – methods, questions, categories

The importance of convergence was underscored by several discussions. Developing a common approach to user studies would further the ability to approach OER as a collective movement rather than as a series of isolated projects. A valuable goal, according to many participants, is to articulate general principles and standards as a community. Indeed, when asked how they would go about designing a research agenda for user studies of OER in general, many participants suggested that future studies should take place under an umbrella framework that ensures consistency and the capacity to generalize. A coordinated effort would then ensure that at the end of the study period, we would be able to draw definitive conclusions about “the general world of users.”

Section Two: Users, user demand, and sustainability

A. Value and sustainability in context

Although we devoted an afternoon specifically to the topic of sustainability, it was in fact a recurrent subtext woven throughout the two days of discussion. The formal discussion focused on the following questions:

- What do we mean by sustainability and what are its dimensions?
- What is the relationship, if any, between understanding current and potential users, and questions of user demand and sustainability of open online educational resources?
- How important is it to distinguish between those willing and unwilling to pay for use of online resources (e.g., undergraduate contexts versus informal learners, etc.)? Between intentional users who have specific educational goals and broad-spectrum users?
- What are the financial implications of subsidizing informal users?

Concerns about sustainability were introduced early in the meeting during Phoenix Wang’s discussion of the Hewlett Foundation’s OER value chain. She explained that the foundation has moved away from the creation of content and toward considerations of access and the authentic use of resources in real educational contexts.

Vijay Kumar began our focused discussion by asking us to think about value and distinguish among the multiple aspects of sustainability: technical, financial, and organizational. He pointed out that technology and infrastructure are inherently transient and variable, and that ultimately content needs to be designed to enable choices in complex contexts. Value, as a measure of sustainability, is ultimately determined by heterogeneous communities and needs to

be understood in each community's local context. Technological innovation should not be considered a value for its own sake. The questions to address include: What are local priorities? How do usability and complexity interact to define value in specific contexts? How do costs and support service needs affect value? How do various sectors (e.g., publishers, faculty, students, etc.) value the same resources? Finally, he suggested that the organizational structure within which the OER is embedded should enable the participation of different sectors. This need is especially true for "open" OER (OOER). As Kumar put it, "Value is determined by people being able to get to the value." Kumar pointed out that even expensive technologies can be discarded if they do not fill needs in local contexts or local cultures.

Definitions of value and approaches to sustainability also vary according to each OER's context and goals, or the specific problems that an OER is trying to solve. It was argued that the only way to understand the value of OER – for individuals, communities, and institutions – is to measure its impact and its outcomes. Does OER improve educational and societal outcomes? And how can those outcomes be measured rigorously when so many users are "informal" and difficult to track?

Following this introduction, the group spent considerable time debating the components of sustainability and value. It was agreed that codifying the ingredients of sustainability and the types of value would be necessary to answer recurring questions such as, "How do you measure success?" and "What makes a good OER?" A number of schemes emerged for breaking out these dynamic aspects of sustainability and value. We unanimously agreed on four key components of sustainability:

- Curricular
- Technical/Infrastructural
- Organizational
- Financial

B. Curricular sustainability

1. Assuring quality – who vets?

In the world of open-access educational resources that were represented at the meeting, quality and value are central concerns. Users have to trust the quality of OER content to value and therefore use it. Real concerns about propagating misinformation and poor quality educational materials are common, but there are also costs to high quality. For example, quality is determined to a large extent by accurate, timely, and updated information. But these very requirements can be a significant obstacle to sustaining OER financially.

Who, if anyone, is responsible for assuring OER quality? Two primary answers were provided: the content producers should survey and control the quality of their content, or it can be left up to the user community to vet the material, either through peer review or some kind of ranking based on social tagging mechanisms. The ensuing conversation explored the contents, purposes, and audiences associated with each of these models.

Producers can vet

There are a number of issues that relate to quality in OER. Users often rightly associate OER content from prestigious institutions like MIT with higher quality. Such universities already vet the faculty and other staff who create OER; in these cases, it is the institution that guarantees quality. In other cases, however, OER is not the product of an accredited higher education institution but rather an aggregator, referrer, or independent OER publisher. As new providers of OER emerge, it may not always be easy for users to sort the good from the bad.

Some producers choose to actively control quality by strictly enforcing their own pedagogical and production standards, sometimes linked to highly specific course or certification requirements. In these cases, scope and sequence is relatively fixed. This tight linkage may result in such highly structured and linear content that it becomes difficult to reuse the material outside of the context originally envisioned by the producers. There was some discussion that the more independent and inexperienced the learner, the more structured the material needs to be, which itself creates tension between quality and reusability.

Other sites, such as the referratory MERLOT, have established a peer review process, which benefits from carefully chosen content experts and a clearly defined set of criteria. In both cases, the OER are “branded,” and that branding confers quality at a relatively high level. When branding is important, it also becomes paramount to avoid brand dilution. As a result, some contributors and content are turned away, which is seen by some as antithetical to the idea of “open” content. Such perceptions of elitism create additional tensions within the OER movement.

The community can vet

At the far extreme of OER being produced by a prestigious research university such as MIT are sites where anyone can contribute to a corpus of information and no one will be turned away (e.g., the Wikipedia model). In marked contrast to the MIT OCW model, the user community itself takes the place of institutional or individual authority over quality. In a totally user- and learner-centered model, quality is a function of whether users get what they need from the material. Quality in this scenario is simply relative. However much work an institution puts in to producing high-quality OER, it is ultimately up to each user to make the final decision about whether the material meets his or her standards and will be useful. Connexions and Google are two online examples where quality is vetted by a grassroots community process: a voluntary peer-rating system in the former, and a mechanized system in the latter.

Alan Wolf, meanwhile, provided a different perspective.¹¹³ The science faculty that he studies claim to trust neither peer review nor community vetting; instead, they simply rely on their own personal judgment in every case of using an OER, or they consult with a trusted colleague. Similarly, the responsibility of quality could also rest with the individual faculty member who guides student users to the best OER for his or her purposes. In this model, though, the vast

¹¹³ Alan Wolf described the National Science Digital Library’s (NSDL) user study he and others are conducting. NSDL noticed that, despite the high quality of their digital collections, their collections were not being used as much as anticipated. In designing the study of faculty, Wolf and his colleagues followed the CSHE model. They are collecting existing research on this topic, and also plan to design a toolkit that would make their study replicable and perhaps useful to others.

emerging universe of unaffiliated informal users remains without the benefit of such a guide, and users are left on their own to make sense of the information.

The role of (active) user communities in sustainability

A community can be made up of users who are studying the same material or who are interested in the same knowledge clusters. Once connected to an OER community, users are more committed and likely to contribute to the site. The types of communities discussed ranged from students who take a course together, to self-learners who meet while studying the same material, to faculty in a similar discipline who might share and develop course content.

The type of content, or the degree to which it is “cooked,” may determine to some degree the role of the user community. The more easily the content can be manipulated, the more likely a user community may be given free reign over adapting materials both for their own needs and for the user community at large. Of course, the downside is that the independent learner is left with a diminished learning “roadmap” to follow.

One model, illustrated by Connexions, encourages a user community to actively contribute to OER, ensuring curricular sustainability in two ways. By taking an active role in developing content, users help the site offer continuously growing and improving content. Simultaneously, an active user community can ensure that the site makes an impact: users develop the content that is useful to them in their local context and that takes into account their (or their students’) learning styles and objectives, rather than what the institution or producer would unilaterally choose. By building user communities in this manner, OER can develop a feedback loop between users and site producers (or developers), but only if there is a mechanism to document the products and processes created by the communities in question. In the case of Connexions, each time a user makes changes to a set of materials, a unique version is published to the corpus.

Participants recognized ongoing problems and risks when it comes to community reuse. Much of the time, repurposing occurs outside of the OER and does not return to its site of origin (unlike Connexions), and hence does not increase the overall corpus of knowledge. Some participants felt that reuse puts quality at risk: curricular value may get lost when pieces are taken out of context, and the repackaged resources that a user contributes back to the site may not be of high quality. Connexions has found that the pieces contributed by some users have no copyright clearance and/or are not in keeping with the site producers’ specifications (e.g., images, syllabi, course details, office hours). Additionally, including such items would reduce the reusability of content by others.

Creating and maintaining community

Though many sites find it desirable to have a critical mass of users constantly creating, using, reusing, and adapting content, how a site can encourage and support such vibrant growth remains a question. Community is dynamic and hard to predict, and it may have much more to do with users themselves than with anything that an institution can author. As one participant suggested,

Community doesn't just happen by making content available. You really need to have some sort of an infrastructure, and it's not simple to do, to allow the community conversations to happen, and to really have leaders that get people in a subject area or

interest area together. They have to have some sense of belonging to that subject before they're ready to start giving back and improving.

Learning communities are, as one participant put it, transient by nature: as soon as the material is learned or the course completed, there may be little reason to keep participating. On the other hand, while a particular course has an end-point, many users are ongoing learners who need to keep up with their field (such as tax law), and these learners benefit greatly from being in touch with others in that field. Communities may be easier to create around a subject area with multiple courses than around one course. The resulting challenge for OERs is how to support these various communities.

Currently there is no common set of standard tools or practices to help achieve interactive community on a large scale, though emerging social computing models such as Wikipedia, individual “play lists,” and social tagging (e.g. del.icio.us) were hailed by some as a possible way to merge individual needs with resource sustainability.

Several initiatives are developing techniques for encouraging community and reuse. Lisa Petrides and Toru Iiyoshi described their emergent projects that are being designed to facilitate such communities. With Hewlett Foundation support, Petrides at ISKME¹¹⁴ is creating an open-content portal that would act as a layer to open content resources and will point users to open content, particularly educational materials. The project intends to have both a top-down and bottom-up process, so that it will be organically driven (through tagging, etc.) and will contain some measure of quality vetting. The portal will point users to other people’s repositories, but will not be a repository itself. The portal will initially be seeded with pointers to particular content, especially courses, from specific fields (not yet identified). Toru Iiyoshi demonstrated the Knowledge Media Laboratory developed at the Carnegie Foundation. The KEEP toolkit¹¹⁵ is an open technology being deployed and tested that allows instructors to gather and use OER, and also to reflect upon and share best practices in the use of OER.¹¹⁶

While it is far from evident that spontaneous talking and sharing among users creates real educational value, a substantial knowledge community could be encouraged by an appropriate OER site design. One conversation explored how open-source software encourages community to develop organically. People in open-source software participate because they enjoy the prestige of being part of a community that creates create software and that improves with iteration. The degree to which the open software movement is analogous to open content creation is questionable, however. In the former, bad code simply doesn’t work and cannot endure, whereas with academic content, misinformation can propagate uncontrollably, especially in non-technical, non-scientific fields.¹¹⁷

¹¹⁴ <http://www.iskme.org>

¹¹⁵ <http://www.carnegiefoundation.org/kml/keep/>

¹¹⁶ <http://www.carnegiefoundation.org/kml/keep>. Similar sites and toolkits are being developed, such as COSL’s eduCommons software (<http://sourceforge.net/projects/educommons>) and the Development Gateway’s community site, which targets developing countries.

¹¹⁷ At the suggestion that machine translation could offer a mechanized way to make OER more readily available to different cultures, it was pointed out that this could be particularly dangerous in well-crafted curricula where accuracy is paramount.

Intended vs. unintended users

The unintended or informal user community, as opposed to those university faculty or matriculated students for whom the OER may have been initially produced, clearly has to be considered to enable understanding of the value of a resource. For many OER initiatives, the informal learner is an exceptionally important metric of value, even though matriculated students, and the faculty who teach them, are the primary targets. One question that arose time and again was whether the OER could or should adapt their content or services to unintended users. How and if these informal users should be subsidized is a problem in search of a solution. Significant discussion around the following questions followed:

- How does unintended use impact a site's mission?
- How can unintended use add value and contribute to sustainability, or is it simply to be viewed as a pleasant by-product of targeting a core audience of paying matriculated students?
- What happens when the tables turn, and OER sites are transformed by informal users in ways that site producers never predicted?
- To what extent does a site subsidize the cost of redesign to accommodate all of its users, including those who are unintended?

Participants answered these questions in different ways based on their unique missions, primary value propositions, funding models, and institutional obligations. Some sites, such as MERLOT, remain committed to their original target audience and do not intend to change their mission or customize content for unintended users. Other sites, such as MIT OCW, view unintended international users as a new strategic opportunity and have aggressively adjusted development efforts and resources to meeting the needs of these new audiences.

To some participants, unintended use is an opportunity for creative reuse. The pedagogical innovations that occur around some materials often result in uses that the original author had not intended. To other participants, unintended use represents a possible revenue opportunity, signaling to the site producer a new market that may be larger and/or more lucrative than the site's original target audience.

Participants discussed reasons that an OER site should not or could not change course to serve an unintended audience. During a discussion exploring the pros and cons of expanding to serve the K-12 audience, particularly the lower grades, it became clear from Geneva Henry's description of Connexions that the support costs of accommodating a new audience could be potentially very large. Costs might include the necessary staff to develop new content and support educational goals and standards that are out of a producers' original domain in higher education. Some participants also worried about inevitable trade-offs: by shifting resources toward a new audience, a site could find itself under-serving its intended users. Finally, funders may not wish to support a target audience that differs from the audience they originally envisioned. And as one participant asked, given the nature of OER, is it possible to limit how a site is used? How a site accommodates unintended use requires a complicated calculus that must account for the site's mission, scope, financial model, desired impact, quality control, and targeted constituencies.

Finally, if content can be used with other technologies and other tools, it might be reasonable to assume that there is another category of unintended users – commercial entities. For example, one question raised was how the commercial publishing community could add value to an open-access resource. Will the OER community resist use by such a proprietary commercial entity? It was suggested that we think of OER as part of a large ecosystem that includes various players who want to contribute value, and in doing so, help to sustain it on multiple levels. This notion introduces yet another tension between the values of the producer (who may want to give it all away) and potential users who want to integrate it into a commercial venture.

C. Technical/infrastructural sustainability

1. Centralized repositories, aggregation, and metasearch

It was argued that OERs, and especially OOERs, need a common place where they can be reliably housed, organized, searched, and preserved, perhaps in one or more centralized OER repositories. And other institutions or individuals must be able to easily contribute material. The benefits of centralized repositories include a high level of quality across the board, coordinated promotion as part of national outreach, and an organization for relatively easy search. How a centralized repository would be organized was open to debate. Several types of repositories currently exist or are in development (e.g., Connexions, NROC¹¹⁸), but they are still disparate and idiosyncratic in their character, technical requirements, target audiences, and learning objectives. To overcome this problem, one participant suggested that materials could be initially concentrated into a reliable repository and then later broken up into relevant communities such as science or humanities.

Aggregation of resources into “super” repositories is a supply-driven solution that may make it easier to maintain OER but often does not take into account what works best for users. For example, a centralized repository may not change the incentives and barriers of using and producing OER in the first place (e.g., time budgets, promotion and tenure, intellectual property, trust in brand). Users, perhaps especially those in academia, may want to innovate and use their own “collections” rather than download those that are pre-existing. Similarly, contributors, especially institutional contributors, may be less willing to go through the process of adapting and donating their content for centralized aggregation unless they feel that the repository is sufficiently developed and of equally high quality.

Several participants agreed that federating searching among all OER sites would be desirable, though it may be technically far off, and would likely require a high level of standardization and collaboration among all OERs. From the users’ perspective, an aggregated repository, where learning objects are consistently configured may more easily enable them to reuse with their learning management or other systems.

2. Will Google become the master repository?

There is plenty of evidence, including the data presented in this study, that many, if not most, users already treat Google as their portal to OER. There was concern expressed about the sheer volume of Google results, which places the impetus for sorting on the end user. As Google expands and digitizes more content, will it become the default gatekeeper? Yet, according to

¹¹⁸ <http://www.montereyinstitute.org/nroc.html>

the this study's findings, faculty will probably not rely exclusively on Google or the books that Google is digitizing, but often on a vast array of free and proprietary online content, including their own personal collections. One participant nonetheless speculated that Google's efforts to allow users to store their own content may make them the one (already very large and well-funded) centralized OER repository. As the gatekeeper of OER, Google could not only become the distributor for OER resources, but likely the space where content is repurposed by new communities.

3. Supporting reuse/tools

Finally, beyond the question of where OER are housed, where would users find the tools that make use and reuse of the materials possible? Without such tools to easily integrate digital "stuff" into local contexts like a classroom, a PowerPoint presentation, a research project, or into different platforms, the content will likely be underutilized. Although this topic ran through some of our discussions as simply understood, it was not a main focus, as we were not concentrating on technology *per se*. Some technical and cultural considerations arose:

- Faculty are particularly careful where they invest their creative energy; when they do, the resources they choose must be not only easily accessible but adaptable to their local environment.
- One of the primary goals of OER is to increase the corpus of overall knowledge and to use, not simply amplify, original materials.
- Users may want access to a one-stop shop where they find, adapt, reuse, and integrate materials into their own practice, and perhaps contribute back. This process may require technology on all levels: a CMS on the front end, an archive on the back end, and a content repository at the center.
- Well-developed products have a whole set of variables that contributed to their original design and therefore it may not be a good idea to make these types of products available for reuse.

D. Organizational sustainability

Sustainability is inextricably linked to organizational value, which treats the question of how OER fits into the organization that supports it. To what degree does the host institution value the OER site, and to what degree does the site's value drive institutional support?

As discussed above, a basic concern of sustainability is an OER's physical existence: hardware, servers, and staff maintenance need to be continuously available. In many cases, and in contrast to MIT OCW, there is an *ad hoc* approach in which a faculty member cobbles together local support, be it hardware or technical support staff. If he/she leaves the institution or runs out of funding, the OER can potentially be compromised.

Long-term commitment for OER is generally unclear. Saul Fisher pointed out that "unlike print resources, many online or open educational resources are unmoored from a given learned society, or publisher. Typically, they are instead attached to an individual scholar or to a center that produces them, or to the host college or university for such scholars or centers." Institutional or organizational commitment can take many forms and can be garnered on several levels.

Depending on the OER, institutional commitment can overlap with all forms of sustainability; content, servers, and software may all require regular updates, and there is a cost for that. Further, the question of buy-in arose: at what level is institutional support sustainable? At the individual faculty level? By discipline or department? By school or college? Or at the highest level through commitment by a president or chancellor? There was general agreement that the success of MIT OCW is very much a product of leadership from the top and that it primarily serves the institutional mission, but has secondarily resulted in many positive unintended consequences.

It was suggested that, at minimum, some formal agreement should be made between the institution and the site developer indicating the level of the institution's commitment. This agreement should include a definitive time commitment, whether fixed or *in perpetuum*. Similarly, a faculty member who oversees an OER should clarify that its intellectual property can be used by the institution even in his or her absence. Thus, organizational sustainability requires a two-way commitment between the site producer and the institution.

E. Financial sustainability

How do you fund a product that you give away? At this stage, many OERs depend on a mix of institutional, foundation, and corporate funding, and have few concrete plans for financial sustainability. Foundation, government, and institutional funding cannot be presumed to be reliable, so producers need to look for revenue streams from the market or other sources.

Determining when educational content and associated technology is cost effective is not an easy task. Saul Fisher provided background on some early Mellon Foundation educational technology experiments that were unable to clearly demonstrate cost-effectiveness. His description follows:

The Mellon CEUTT studies (Fisher and Nygren, 2000) showed that in various contexts the use of educational technologies does not appear to be cost-effective. While the findings were diverse, one general lesson from the economic side of the studies was that there is no reason to believe that deployment of such resources is more likely to be cost-effective than not, for colleges and universities. One obstacle to cost-effectiveness is the moving target. Instructional technologies – as well as the curricular modalities they support – have been in flux for over a decade, and show no signs of attaining the level of stasis we associate with, say, teaching in front of a classroom with chalk in hand. A further challenge is identifying those core qualities of such technological and curricular innovations that merit support as near- and mid-term innovations, independent of their immediate cost-effectiveness (or lack thereof).

The use of open educational resources has stabilized, overall, in that every college and university now offers or makes use of OER to some degree. Students expect it, and faculty are coming to terms with it – or have done so already. And the general scheme for production, deployment, and use is more or less well understood. Many questions remain, though, not the least of which involve technological and fiscal sustainability. These are generally questions of how, rather than whether. Indeed, whether or not using open educational resources is a good idea pedagogically or cost-wise, it is clearly an unquestionable, even largely unquestioned, element of the higher education instructional landscape. This use is here and we have to accept it and deal with it in what fashion we

may. What remains unclear is how such resources will be sustained financially as their use grows larger and larger.

1. “Business plans” in an educational context

The conversation moved to the topic of “business” models for OER. There was no pretense within our small group that we had the necessary expertise to provide a thorough inventory or an answer in an afternoon. The general conclusion was that the models that exist all fall short in some way, or are very specific to particular initiatives.

There was agreement that any business model has to first determine the production costs, followed by costs for delivery and sustainability. It would be necessary to identify interested stakeholders willing to support the project, whether users, foundations, home institutions, or some combination of all. All of these concerns must then be tied to the desired outcome of the project.

Some sites described their current efforts to develop “business plans” to supplement or, in some cases replace, foundation and public funding. CMU OLI, for instance, described the dilemma posed in anticipation of foundation funding ending. In an effort to continuously improve and augment their courses, both in terms of content and technology, they have collaborated with Ithaka to launch a formal project investigating potential business models.

Connexions has brought in revenue by self-publishing some of their courses as textbooks; in the big picture, however, neither that nor any other existing business model earns enough to keep them fully sustainable. They considered developing some sort of consortium or exploring other options. After presenting the business school faculty with their ideas, they have embarked upon some basic market research to better explore who their stakeholders are and to identify the key value in their service.

The business model that best fits the needs of a project will, of course, depend on what is being sustained, whether curriculum, modules, learning objects, or other types of content. A range of possibilities arose, and the following models were suggested as worthy of exploration.

MERLOT, a referratory with peer-reviewed learning objects, is based on a modified, more open subscription model. While its content is entirely open and free to any user, institutions can pay to become partners. Paying a subscription allows access to services such as faculty development, and subscribed institutions are also invited to become part of MERLOT’s decision-making process. These partners are responsible for “wrapping” learning materials with information about how people use them, including peer review, assignments, user comments, and the newest feature, called Snapshots, where the authors include information about why the learning materials were created, how they used it, and how others might use it. Registered users, of which there are currently more than 22,000, also have a means to create personal collections, where they can create a compilation of materials that they use for a particular class or purpose, and then annotate these materials. Other participants noted, however, that at this time the benefits of partnership remain too intangible to offer significant value over the site’s free contents.

The Stanford Encyclopedia of Philosophy (SEP),¹¹⁹ an online open-access philosophy reference resource, was discussed as an interesting case. As described by a participant, the SEP has developed a funding model styled in part after those embraced by public radio (typically, NPR affiliates), where site visitors are asked to contribute voluntarily to keep the site going. This “public radio” component is intended to fill in the gap (\$1.125 million) for their overall fundraising effort (\$4.125 million) to establish an endowment fund.¹²⁰ The SEP’s larger effort depends upon a partnership with the global library community to raise funds through one-time contributions and membership dues in exchange for continuing to offer free and open content.¹²¹

Endowment model

There was some discussion about endowment being a successful model because raising endowment funds is a common practice in academia. Successfully raising such funds would require that the donor perceive great value in the project and that the project can demonstrate longevity. Whether or not such a fundraising strategy could be broadly implemented in OER at large remains a question due to the possibility of donor fatigue, among other things. In any case, soliciting donations works better when it is clear which program the donor is supporting and when that donor is convinced of its quality, which could be a challenge for OER sites that do not have an established brand or a clear and loyal user community.

The Digital Promise (Digital Opportunity Investment Trust – DO IT),¹²² is perhaps the most ambitious model mentioned. DO IT is a nonprofit, nongovernmental agency dedicated to funding innovative use of advanced information technologies in libraries, archives, museums, school systems, community colleges, universities, arts and cultural centers, and public broadcasting stations, to allow them to continue to serve their essential public purposes. The proposed trust will be financed by revenues earned from investing \$18 billion from the mandated FCC auctions of the radio spectrum.

Society subscription model

In particular scholarly communities, such as professional societies, a move to a subscription model could meet with some degree of success because it builds on existing sustainable infrastructure. For example, those who subscribe to print journals can more easily shift to using that same journal online. This model becomes problematic, however, because it prevents access to anyone who isn’t a member of that society (and pays dues), an aspect that is obviously antithetical to the OER mission.

Commercial curriculum model

It was discussed that a centralized OER repository such as Connexions could offer raw curricular materials to commercial vendors who would repackage and sell them. Another

¹¹⁹ <http://plato.stanford.edu>

¹²⁰ The NEH has offered a \$500,000 matching grant (\$1 for every \$3 raised) for library partners. See: <http://plato.stanford.edu/fundraising>.

¹²¹ The Joint Information Systems Committee (JISC) is now contributing to the operating fund on behalf of the U.K. education community, after establishing that the SEP was a first port of call and valuable tool for the U.K. community.

¹²² <http://www.digitalpromise.org>

possibility would be to redirect the textbook revenue stream to curricular OER. The National Repository of Online Courses (NROC) at the Monterey Institute for Technology and Education (MITE) is exploring a variation of this model.¹²³ MITE's business model earns revenue from low licensing fees similar to open-source software, but also encourages "barter" – trading access to existing courses in exchange for new contributions to their digital resource collection.

OER sites could offer free content with fee-based services and tools such as course management. This might be a way in which OER sites could explore corporate partnerships. But for these or any other ideas to be profitable, OER sites need to significantly increase users. As several participants put it, a "critical mass" of users is essential, and currently many companies do not see the educational market for OER as large enough.

Commercial education model

The University of Phoenix¹²⁴ was discussed as an example of user-centered commercialized education that has reached critical mass. What can we learn from how the University of Phoenix does business?

- It keeps costs low by outsourcing to teachers and tutors around the world, who are paid by their output.
- It keeps customer satisfaction high by offering rapid turnaround and services to students.
- It appeals to demographics that have not been well served by existing higher education, and students who need results-oriented rather than prestige-oriented education.
- It uses a traditional instruction model: education is organized by degrees and courses with teachers and grades, with a hybrid of online and face-to-face instruction.
- It spends 30 percent of its budget on marketing.
- The degrees it offers are desirable and convenient, and it ensures high quality by being very responsive to student needs and tailoring materials to student performance.
- Its success comes from being totally user-based: it helps students achieve their objectives, and the prestige of the faculty/institution doesn't matter.

2. Commercialization vs. public good

Is commercialization desirable, or even appropriate, for OER? There is much hesitation in academic circles to endorse the concepts of market research, strategic planning, and commercial sustainability. Academic institutions do not operate in the same way as commercial enterprises, and, some say, we should not necessarily expect them to. Indeed, commercialization conflicts with OER's central mission of free access for the public good. From this perspective, OER should be treated as an educational resource within a tradition of formal education, one that is subsidized by the institution's core mission of research, teaching, and outreach, and should not be translated into business terms. Students and faculty are not customers, and curricular materials and the faculty who use them are not products.

¹²³ <http://www.montereyinstitute.org/nroc.html>

¹²⁴ <http://www.phoenix.edu>

Discussing a commercial side of OER often raises general anxiety about ways in which higher education is being transformed into a commodity. Students' learning objectives are driven by convenience and by the pragmatic value of a completed course or degree, rather than by education for its own sake.

The discussion concluded that the traditional teaching role of higher education institutions is to certify knowledge and educational quality. Perhaps by focusing on this role even in a commercial context, universities and OER can be financially sustainable without abandoning their mission. As Gary Matkin put it,

There is an issue that unrecognized, it's captured in this phrase. It's an advertising phrase for a continuing education organization. 'Take this course before you enroll.' Take this course before you enroll. Here it is, it's up, it's open. That makes a lot of sense to a lot of people in the world because potential students may want to find out whether they can get a good grade on it, or they want to find out whether you can handle it, or whether you have time to do it and so forth. The dirty little secret of many independent study operations is that there's a huge dropout rate. And people actually build financial models around the fact that 50 percent of the people that are enrolling in courses are never going to finish.

In this type of convenience market, there are implications for how we create the course. It has implications for the financial model, it has implications for the user, for the user group, and the marketing. It also has huge implications for education and now. If there's an exam that certifies your knowledge, then you can take this course, but you never have to enroll, and you can take this exam and get what you want, then you cut out the higher education middleman – the teacher, the registrar, etc. What I'm suggesting is that we have a business model in which we have all this stuff up online, and this is click here to enroll. What we found is that people go halfway through it and they say, "I want to enroll in this course, sure, I can do this," click here, and they enroll. And so it's that sort of business model that I think...might be a new one to try out in the realm of OER.

3. Limits and parameters to funding by foundations, institutions

For those OER sites that wish to remain non-commercial entities, a combination of foundation, institutional, and/or corporate funding nonetheless remains the only source of financial sustainability. While some foundations will continue to fund innovative OER projects that have high curricular value, foundations increasingly ask grantees to demonstrate that their OER has meaningful impact among users and that it will remain sustainable after the life of the grant. They say upfront, "Show me the other players. I don't want to fund a single institution. I want to see the other players, because by virtue of hiring a collective, the likelihood of success is increased."

Foundation funding today is increasingly tied to OER value. During Shannon Lawrence's interviews with site providers, as well as in the discussions above, well-established OER sites agreed that, as their sites evolved, they were better able to demonstrate value (in various forms) to their institution and funders, which better enabled them to receive core budgetary funding and grants. Many emerging OER sites agreed that they would soon have to prove their worth to their primary constituents to receive sustainable institutional support and funding. If an OER makes a significant impact on matriculated students and other key constituencies, it is more likely to be funded and sustained.

F. Measuring and establishing a user base

In sum, understanding users, differentiating among users, responding to users, are all key to making OER sustainable, in any financial model. As one participant put it, “Where is the user base? What value do users find in this? And how do they form communities to have something that will sustain long-term? And until you know that, you don’t know how you can keep it alive.” Any discussion of sustainability models – how to design the OER and how to pay for it – rapidly turns into a discussion about users. A sustainability model has to seriously attend to its potential customers: will enough people use the service to make it profitable, sustainable, and/or meaningful in such a way that the user will pay for it or that a funder or institution will subsidize it?

The question of how to do market research brings us back to a set of methodological issues: what parameters and categories do we use to study and talk about OER’s various audiences? There are some methodological concerns that come up when we approach the question of user studies with financial sustainability in mind.

How do you define and measure “critical mass?” If it is the number of users that makes the OER commercially practicable, how do you determine that number? If it is market share, of which market is it the share? User base can be measured against all Internet users, against the textbook and education market, or only against the online textbook and education market. Who are the potential users who need to be captured to succeed commercially? The market for OER needs to be defined so that it is quantifiable. For instance, if one wants to define the OER market as faculty, the market size can be calculated by determining the total number of universities and faculty affiliated. Finally, what metrics are most meaningful in commercial ventures? None of the readily available metrics – number of hits, unique visitors – really capture an OER site’s potential profitability.

How do you measure success with foundation funders? One participant suggested that foundations should clarify their parameters: is it more important to reach new users, to improve education for existing users, or just to garner a large volume of users? What if you succeed at impacting a population that the foundation does not care about? There was general agreement that each OER needs to define its own mission first, then align its goals and activities with that mission and focus on a targeted set of funding opportunities. Any source of funding will ask for some measure of value based on the OER sites’ actual impact and use.

Section Three: Imagining a research agenda

Gary Matkin concluded the meeting by inviting participants to imagine a hypothetical scenario: if you had five million dollars to spend on OER research, what research projects would you prioritize? Participants agreed that all studies should be coordinated to use a similar set of terms and techniques, so that findings can be shared effectively and made generally applicable. Multiple research topics were suggested, but they converged on one primary and one secondary research priority: faculty and self-learners, respectively.

A. Study faculty

After some debate, participants agreed that studying faculty would yield the highest return for coordinating knowledge about users across projects. Faculty use is the most common channel by which OER has an impact, since in most cases students use OER at the behest of their faculty instructor, who by definition is qualified to make decisions about curriculum. As Diane Harley put it, there is a long tradition of certain systems (namely, higher education) being set up to move students through to get some kind of certification of knowledge. “It’s an economic issue, it’s a quality of life issue, it’s a social-good issue.” Generally faculty have been good at being the mediators in knowledge acquisition and creation in higher education environments. They are the ones with the knowledge, they (and librarians) are the ones with the abilities to find relevant resources, they organize knowledge in packages and pathways, and they have experience in teaching subjects. By focusing on them as a domain of users, we have a high probability of understanding a large segment of OER use.

Several approaches to studying faculty were proposed. We can study the ways in which existing faculty OER use furthers “excellence in education,” as one participant put it. How do faculty integrate OER to improve educational outcomes? Other participants felt that studies should focus on faculty practices and beliefs about OER rather than on learning outcomes. Why do so few faculty create materials and put them online to share? Why would they not give their knowledge away?

Many participants felt that the key point of study should be why so few faculty use OER. What are the barriers to use? Are they technical, or are they related to more difficult issues? How can those barriers be overcome? One participant referred to claims in Robert Zemsky’s 2004 report “Thwarted Innovation” that startlingly few faculty have adopted OER in their teaching, which is of great concern to OER providers. Non-users may be harder to find and harder to study, but they are the most important group to understand. To study what it would take to increase faculty use, participants recommended designing a controlled experiment of incentives and rewards, or studying the motivations of faculty who have just begun using OER.

In any case, all studies of faculty use need to take into account different faculty categories, by institution, location, discipline, and other considerations.

B. Study students and self-learners

Studying “students” was also seen as a priority, but it was agreed that it presents a different set of methodological problems, especially when students may not have affiliations or clear learning objectives. Participants were very interested in learning more about self-learners, because they are the group about which least is known and who are possibly the most heavily subsidized. At the same time, participants recognize them as the best opportunity to fulfill OER’s mission of universal free and open-access education. Indeed, attending to this potentially large user group might lead OER to expand its mission beyond the traditional institutional structure of higher education. But it was agreed that designing a rigorous study of this population would be exceptionally challenging for whoever undertook it.