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## Probusage in A/Synchronous Learner-Led E-Learning

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## Prodsusage in a/synchronous learner-led e-learning

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Creating a successful produsage environment for a required course taught via e-learning requires analyzing various factors: the learning context; learner-led education in required classes; the structure of the class; and reflections and evaluations of each semester's iteration of the course. Taking a produsage perspective, this paper analyzes the long-term development of a required graduate-level course in information organization. The course is examined closely to show how its materials, assignments, technology, instruction, and culture contribute to a learner-led produsage environment and lasting knowledge creation. The analysis leads to implications for course design and working with learners to create knowledge that may be applied in multiple settings.

**Keywords:** e-learning; information organization; library and information science; learner-led

### 1.0 Introduction

In most disciplines or professions there is some essential part of the knowledge base that even enthusiastic learners will find boring, and even motivated students will be reluctant to pursue on their own. Creating a learner-led education environment for such material requires an instructor (who is also a co-learner) who deeply understands the subject matter and the knowledge construction processes associated with it. Moving this learner-led environment into a hybrid, mobile, or ubiquitous learning mode also requires understanding how technologies affect and are affected by interactions between learner and material, among co-learners, and between learners and instructor/co-learner – in good and bad ways.

This paper critically examines the development of an a/synchronous (combined asynchronous and synchronous) e-learning space to foster exploration and knowledge co-creation. Through the lens of produsage, it analyzes the long-term evolution of a learner-led required graduate-level library and information science (LIS) course in "information organization" ("course" is used here in the U.S. sense of a one-semester treatment of a single topic generally offered by one instructor to anywhere from 5 to 500 students). The primary data sources are 11 versions of the evolving course syllabus from 2002 through 2009, anonymous course evaluations, and personal reflections of the author/instructor/co-learner.

The result of this evolution is a tightly-integrated course design that, each semester, forms a largely-invisible infrastructure (Star & Ruhleder, 1996) or scaffold (Vygotsky, 1978) upon which the learners together produce and use (produse) materials and knowledge iteratively. Following a brief discussion of produsage in e-learning settings, this paper examines learner-led education in required classes; the suite of artifacts analyzed for this examination and the structure of the class; the course's e-learning

context; and discusses the significant findings for produsage in a/synchronous e-learning environments.

## 2.0 Produsage and e-learning

Produsage reflects a profound shift in the relationship between people and information, where people no longer are divided into creators and consumers but instead engage in ongoing co-re-construction of information so that users-are-producers-are-users-are-producers, wherein the produser has a substantially different relationship to content than they would as either producer or user. According to Bruns (2007, p. 4; 2008, pp. 24-30) there are four fundamental aspects of produsage: it must (a) be community-based, where the contributions of a whole community can be greater than those of selected experts; (b) allow fluid roles, not only varying between production and usage but changing according to preferences and knowledge; (c) tolerate the absence of closure, accepting that content is always unfinished and will evolve iteratively; and (d) allow for the tension between shared intellectual property and individual merit based on each person's contributions. Applying produsage to pedagogy requires the incorporation of these four fundamental aspects, resulting in pedagogy that is creative, collaborative, critical, communicative (Bruns, 2007, p. 6-8) and combinatory (Bruns, 2008, p. 343). When learners engage in a produsage environment, they can "be active participants in the design and development of courses as co-creators of content, particularly through access and contribution to the increasing number of sharable and reusable learning objects and communication and content generation tools" (Bruns, Cobcroft, Smith, & Towers, 2007, p. 13).

Fluid roles (Bruns, 2007, 2008) in a produsage e-learning environment are important, because educational roles have long been (a) strictly bounded, in the sense that the instructor teaches and the student learns, and (b) reified by tradition and habit (teachers teach the way they were taught), by physical structures (classrooms with podiums facing rows of desk-chairs), and by commercial structures (scholars write textbooks that students purchase). A produsage perspective helps avoid these problems because a learner-led and reflexive learning environment encourages new developments to be interjected, overlaid, and created whether or not the instructor has thought of them or is ready for them (see also Bruns, Cobcroft, Smith, & Towers, 2007, p. 19). Beyond the shifting nature of instructor/learner boundaries, fluidity of roles also means each learner's role will change throughout their educational experience and during each semester. Such a consideration exposes an underlying tension between assuming that each learner will wax and wane throughout the semester (producing from their strengths and consuming to their weaknesses) and providing an objective grading standard where every identical mark is associated with the same level of production (see also Bruns, 2007, p. 4).

Another tension has to do with the fluid role of the "instructor." The instructor must be a co-learner because many students know things the instructor does not, and they co-construct new knowledge that can supersede that of the instructor (Bruns, 2007, p. 5). But a knowledgeable person has traditionally been in charge of a class *because* they are knowledgeable (Kirschner, Sweller, & Clark, 2006). Having an "instructor" even in a learner-led environment is important for two reasons that are especially true in the kind of class that will be examined in this paper, i.e., a *required* class. The first reason is to help

keep the ongoing produsage from getting too far out of the scope of the course. This is especially important in a required course where the learning outcomes may be aligned with strict quantitative reporting measures to various auditors and accrediting bodies (although see Bruns, 2007, p. 10). The second reason is to keep the class from co-producing "knowledge" that is extremely far off from what is reasonably true.

Bruns (2007, p. 6) posits that a dichotomy between teacher and learner is representative of an "outdated scarcity/production model" and that there was "a time when the information and knowledge available from teachers did indeed constitute a scarce resource, but (due in no small part to the emergence of the Internet as a major information source) that time has passed." That assertion is largely true but reality is of course more nuanced (as Bruns acknowledges, see below). There are areas of knowledge that students may "have access to" via the internet but that without intervention they will neither encounter nor willingly learn, to their detriment and the detriment of their profession/discipline. The key difference between old models of pedagogy and a produsage pedagogy, therefore, is the difference between "*controlling* what information and knowledge students do or do not encounter" and "*guiding* users through the available wealth of information" (Bruns, 2007, p. 9, emphasis added). The instructor still intervenes, but the nature of the intervention is different.

Just as a conscious produsage approach to pedagogy leads to the purposeful blurring of boundaries between teacher and student, it encourages exploration of the relationships between user-led environments, formal institutions of education, and the knowledge use environments of learners and graduates. A produsage approach to pedagogy meshes with – and perhaps necessitates – a shift away from teacher-led learning toward learner-led knowledge building. In such an approach, learners manage their own learning, often working together in collaborative settings (Bramhall, Lewis, Norcliffe, Radley, & Waldox, 2010). Collaborative learning requires robust technology platforms to support interaction and knowledge building (e.g., Allen, 2010; Greener, 2009; Haythornthwaite, 2006). Learner-led collaborative education for the professions, as discussed in this paper, is most successful when it is focused on connecting learning with its real-world contexts of use (Merrill & Gilbert, 2008; Schaap, de Bruijn, Van der Schaaf, & Kirschner, 2009).

Learners should engage in participatory user-led environments to "develop the capacities which they will require as participants in user-led environments" (Bruns, 2007, p. 1). The ability and willingness to adapt to and evolve with changing technological environments after formal education is over is central to a successful career in library and information science (LIS), and LIS students' satisfaction is shaped by a close connection between their experience outside the class and the theory and experience within the class. A produsage space, especially online where the students are embedded in communities, workplaces, homes, etc. (Kazmer, 2005), blurs the boundaries between the experiences of "study" and "life" (Bruns, Cobcroft, Smith, & Towers, 2007).

One difficulty in thinking about learners and their contributions (the "production" side of produsage) is that within higher education the traditional production/consumption model exists in multiple layers. It includes market-type consumption through paying tuition and

purchasing textbooks, instructors consuming the production of others (using textbooks and articles written by others), and instructors producing materials and performances, which are consumed by students. The distinction between consume as "to use" and consume as "to purchase" comes into play with produsage, where there are use and users rather than consumption and consumers. In many places, those engaged in higher education are encouraged to think of students as "consumers" in the sense of purchasing customers. This approach is at odds with a learner-led educational environment, because customer-students are often unwilling to "do the work of" the professor (see, e.g., Franz, 1998; Svensson & Wood, 2007).

Specific technologies to support pedagogy reveal yet another tension, between the public co-production of knowledge incorporating an array of producers, and the necessity or desire for a protected learning environment. Students may feel it is uncomfortable or risky to make their learning materials and products available openly online, and there are various techniques for reducing this discomfort or risk (see, e.g., DeBlois & Oblinger, 2007). There are two additional considerations with respect to the need for a protected learning environment: privacy regulations at the level of the university or government (Diaz, 2010), and the ability to provide thorough and equitable assessment of students' work (Bruns & Humphreys, 2005, p. 6).

### **3.0 Learner-led education and the unique problems of required courses**

Learner-led education requires several things to work well, including motivated learners. The idea behind learner-led education is that learners, left to study things of interest to them in a way that holds meaning for their lived experiences, will build knowledge that is deeper and longer-lasting than with other forms of education. But in most domains of knowledge there is some core knowledge that will generally fail to inspire or motivate learners – whether it is physics for pre-med students (Kalita & Zollman, 2007), research methods for social work students (Epstein, 1987), or information organization for LIS students (Saye, 1987).

In LIS, information organization is the kind of core knowledge area in which few students would begin to study voluntarily, persist in that study in the face of distractions, and slog through its most difficult aspects to achieve mastery. In such "boring core" areas, inquiry does not naturally lead to a spark of excitement and more inquiry, but to frustration and the desire to give up and work on other things.

Why require LIS students to take this course if so few like it? First, a substantial minority of students choose a specialty in an information-organization-related area such as library cataloging, metadata, digital library management, and database design. For other students – the majority of whom who will pursue an area of LIS that involves information services such as reference librarianship (Saye, 1987) or information literacy – information organization provides an important understanding of how information is structured, searched, and retrieved (Taylor & Joudrey, 2002, p. 222). LIS professionals, educators, and accrediting bodies agree that information organization provides valuable core knowledge that should continue to be required in the LIS curriculum (Turvey & Letarte, 2002).

Another important aspect of learner-led education for required courses is that, with few exceptions (Griffith, 1998), *some* shaping of the environment directs the learners' attention in a specific way. Many factors can be introduced into the learning environment to guide the learners' attention, encouraging them to be persistent and think deeply, while still allowing a "learner-led" experience where the learners feel as if they are in charge and empowered, and resulting in the desired long-lasting knowledge and interest.

All of this is to argue that there needs to be, especially for required courses, a deep and well-conceived substrate of factors that guide students toward the self-motivated, persistent pursuit of knowledge without making them feel as if they are stuck in a muddy trail of boringness devised by someone else. It is better if the course can be designed so that students produce the knowledge (what they take away), the artifacts (videos, podcasts, graphical representations, papers, discussions), and a lifelong interest in pursuing new questions.

#### **4.0 The materials examined and their contributions to produsage**

To examine the evolution of the information organization course through the lens of produsage and learner-led knowledge building, I examined the roles of the following: evaluations, reflective observations, syllabi, technology, texts, and the course instructor.

*Evaluation data* were collected anonymously at the end of each semester, using the university's standard course evaluation which includes scaled and open-ended questions. Evaluation data were used as one indicator of how students experienced the class and were used to suggest changes for future iterations. Thus students who were finishing the class could indirectly share the knowledge they had co-produced for use by students in future classes.

The instructor/co-learner of the course used *reflective observations* to understand how knowledge was being produced in the class, engaging in ongoing reflection on the processes being enacted throughout the term. Reflection each week considered products and outcomes and also students' emotional and intellectual experiences, the pace of the week, evidence of fatigue or boredom (or energy and excitement), and the need for adjustments for subsequent weeks (or semesters).

The course *syllabus* was examined by viewing its multiple versions as texts and as actors. The syllabus, including all materials across the hypermedia course site, regularly exceeds 30 pages with various configurations, linkages, and deployment timing. This is much longer than the norm in our program, and at one point it was added to itself as an "assigned reading," making its status as a text explicit. The combination of hyperlinkages and deployment timing (not all documentation is available right away, so as not to frighten the students, although they have the reading list and all due dates from the beginning) give the syllabus a sense of motion and of being an actor in the class.

The *technology* explored here has three facets. First is the ever-changing technology imposed by the university, which the instructor is required to use in some ways and thus

inevitably shapes the learning environment. Second is the technology selected by the instructor for use by the whole class. Third is the technology chosen by the students/co-learners who live day-to-day in technological environments that include a mix of home, work, and mobile technologies (Kazmer, 2005).

Examining the availability of, and definitions of what constitutes, a *text* helped to reveal the variety of text types and their interrelations throughout the produsage process. The course has a textbook and assigned academic readings but each semester the co-learners produce various additional texts including video postcards, summaries of in-class activities, discussion threads, papers, and a shared bibliography. They incorporate materials that are a result of the broader produsage culture such as publicly available documentation, wiki resources, and library catalog records (an exemplar of produsage with a century-long history of shared production and use; see Andersen, 2002).

The *instructor/co-learner*, examined through the produsage lens, is a curious artifact. The instructor is an actor and a technology, and is a producer at many more layers than are the students/co-learners. The instructor produces and uses the course materials, as do the students, but the instructor produces the course materials with different students over many years. The content and structure are changed in response to student feedback, current literature on the course topic, revised textbooks, technology "upgrades," and new understandings of pedagogy.

### **5.0 The e-learning setting and its influence**

All e-learning settings differ and wide variations across settings affect learning (Benson & Samarawickrema, 2007, 2009). Because this paper is based on one course offered in one setting, it is vital to describe that setting carefully, explaining all aspects that might set it apart from, or make it similar to, other e-learning settings. Making these differences and similarities explicit is crucial for understanding the limitations of the findings and conclusions drawn here, and assessing how they can be applied even in varying settings.

An explication of the educational setting is also important because it shapes what students perceive to be their normal learning environment. Faculty who engage in instructional activities outside that norm may either relieve their students, who are delighted to find something they enjoy better than the rest, or can cause anxiety and discomfort among the students.

The framework used for describing the context of this course, a required course on information organization in LIS, is drawn largely from that proposed by Benson and Samarawickrema (2007, 2009), who used a combination of Moore's (1993) theory of transactional distance and Oliver and Herrington's (2001) model of learning design to build their learning context framework. While this presentation of the learning context is more detailed than is normally found in a journal paper about e-learning, this purposeful inclusion will help to contextualize the subsequent analysis of the course.

#### *Course characteristics*

*(Topical content of the course is described in subsequent sections)*

- By "course" is meant a 15-week-long class that meets with 25-50 students and one instructor
- This is a required course toward a Master of Science in Library and Information Studies degree (MSLIS)
- MSLIS at our university requires 12 courses
- MSLIS is a post-baccalaureate (post-undergraduate) level degree
- MSLIS is accredited in the U.S. by the American Library Association
- MSLIS is the basic professional qualification for librarians in the U.S., required for librarians in most public, academic (university) and school (Kindergarten through high school) libraries

#### *Learner interaction*

- Synchronous weekly 2-hour sessions (optional and recorded)
  - Text chat through Spring 2007
  - Interactive audio with desktop sharing, web touring, presentation, and text chat capabilities from Fall 2007
- Asynchronous weekly threaded discussions
- Separate discussions for: faculty office, café, sharing, and assignment questions

#### *Presentation of material*

- No lecture, synchronous or asynchronous
- Weekly readings from textbook plus additional readings
- "Field trips" during weekly synchronous sessions that encourage students to visit specific sites and resources, analyze and discuss them
- Instructor provides detailed feedback within one week to all learners on individual assignments
- Instructor creates "video postcards" of 2-5 minutes in response to synchronous or asynchronous conversations (video postcards are rarely re-used because they are highly context-dependent)

#### *Learner autonomy*

- Course is not self-paced; students must complete assignments and interactions at specified times
- Extreme latitude in learner topic selection for papers
- Synchronous sessions optional but encouraged
- Some form of interaction required most weeks (but learners decide the medium, nature of content, and pattern of participation)

#### *Assessment*

- Assessment based on interactive discussions and submitted individual assignments
- No examinations
- No graded group work

#### *Learner details*

- Adult learners seeking a post-undergraduate (master's) degree
- Age range 20s-70s, with most students in the 30s



- Most intend to become professional librarians and of those most intend to become reference librarians; few intend to work as cataloging or metadata librarians (career areas with which information organization is associated)
- Learners are generally not in the city where the university is, but most are in the same state
- Most learners are employed, many in libraries

#### *Technical infrastructure*

- Fall 2002 through Fall 2005: specialized course management system built within the School of Library & Information Studies; offered text chat, threaded discussions, assignment submission, gradebook, calendar, and file management
- Spring 2006 through present: campus-supported standard installation of Blackboard(TM) course management system

### **6.0 The deep substrate and strong scaffold on which the course is built**

Information organization is the basis of library cataloging, but is also important for modern aspects of librarianship and information management including metadata creation and management, database design, and data curation. According to the course syllabus, "*Information Organization establishes the conceptual and theoretical framework for organizing and retrieving information, including the study of systems, their objectives and structures, formats, standards, and vocabularies; and the information object and its relationship to organizing systems and to other information objects.*" Despite extensive literature about teaching information organization in LIS programs, little attention has been paid to the underlying pedagogical philosophy (Hudon, 2010, p. 67).

### **6.1 Building the course infrastructure**

The first component of the course infrastructure is the instructor. The instructor must have deep understanding of the subject matter to be able to answer questions, contribute knowledge, and guide learners away from fallacies. The instructor must understand knowledge construction processes within the subject, which can be highly non-linear, subject to fits of punctuated equilibrium and plateaus, and require long periods of confusion before resolving into clarity – such periods require trust by the learners of the instructor and the process. The instructor must grasp how technologies affect interaction between users and materials, among co-learners, and between the learners and instructor. Some technology can be leveraged, some must be worked around, and most technologies will work better for some learners than for others.

The instructor must acknowledge that s/he as an actor, and her role as an instructor/learner, will be co-produced by all the learners each semester. Not every class will need the same instructor role or the same support activities to complete the course successfully, so the instructor must be willing to be newly co-constructed each semester. As well, the instructor should change intentionally across semesters based on reflections, evaluation, and pedagogical influences, and will change unconsciously in reaction to many factors, some of which will not even be directly related to teaching.

As noted above, creating an underlying structure for a course does not eliminate the possibility of learner-led knowledge building (see also, e.g., Bregman & Haythornthwaite, 2003). As will be seen through this examination, the underlying structure is vital for supporting students in the learner-led process. There needs to be an intentional design of the flow of the course that is mindful and thorough but that will not interfere with the learners taking charge of their knowledge building. Intentional design takes time, and is hard to complete without empirical evidence such as course evaluations and teacher reflections as a course is taught multiple times. The following discussion of the underlying scaffolding of this course includes milestones in the course design and delivery that provide examples of shaping factors behind, or because of, the ongoing co-production and co-use of knowledge

A course management system (CMS, sometimes called by the worse name "learning management system") viewed as a monolithic entity is more frequently seen as a technology to be worked around or subverted than to be leveraged or celebrated (Bruns, Cobcroft, Smith & Towers, 2007; Coopman, 2009; Smith & Brown, 2005). I argue, along with those authors, that even within the constraints of a restrictive and not-user-centered CMS, an innovative instructor can build a successful learner-led environment.

Generally, CMSs are "tilted" toward an uncritical, unreflective model that encourages automated grading and one-way transmission of information. For a successful interactive produsage environment one must subvert or circumvent the system to allow robust opportunities for interaction. While this will be primarily group interaction, two other factors are important. First, one-to-one dialogue between instructor and learner via individual feedback is important. In a recent Blackboard(TM) "upgrade," the "improved" discussion forums are easier to grade if one wants to count posts and assign a numeric mark; they are more difficult to use if one wants to give detailed individualized private feedback to each student *outside* the discussion forum. Second, support for the frequent re-creation of all products (text, audio, video) by multiple users is necessary, while many CMSs instead support inappropriate reuse of static materials created by one instructor.

This information organization course was first taught using a course management system that was designed and programmed within the School of Library and Information Studies. In 2005-2006, SLIS moved to a university-level installation of Blackboard(TM). The list of specific issues with Blackboard(TM) could take a whole article (see, e.g., Coopman, 2009; Lane, 2009), but those with important effects on the produsage within this course will be addressed throughout this discussion.

With instructor and CMS in place, it is time to explore the flow of the course. When revising the course each semester, setting up the course Blackboard(TM) site, establishing its shared bibliography platform, building its empty discussion forums, updating the SYSTEM queries (see below), and doing the other tasks required to get a course going, I feel as if I am creating an elaborate simulated city. I design the traffic patterns, build empty buildings, create hills and slopes, and post informative signage. About 10 days before classes begin, the city gets populated with 25-55 people I have never met, and I then spend 15 weeks observing with fascination how my simulated city

functions with real people in it. This discussion explains how I set up my "simulated city" and try to facilitate learning within it.

Online classes at SLIS had always required weekly synchronous class meetings that, prior to 2007, were offered only via text chat. For some students, two hours in text chat led to enthusiastic co-productions of knowledge and an exhilarating adrenaline rush; for other students, sitting through two hours of text chat was abysmal. I used this understanding to produce change: I made the synchronous sessions optional. Many SLIS courses still require attendance at synchronous sessions. But sessions can be recorded and made available to the whole class, and my opinion is that adult learners who have jobs and families to take care of, and most of whom are paying tuition, should be allowed to choose whether to go to class. When students begin my course they are surprised to find synchronous sessions are optional. This first glimmer of choice causes visible excitement – we can *skip class!* – followed by a palpable sense of them feeling the responsibility settle on them – when we attend class, it is by choice, so we had better be ready to be part of the knowledge produsage.

Most CMSs make it easy to treat a synchronous session like a lecture class, and many faculty do so, but the information organization course has no lectures. The closest it comes is 2-3 minute video postcards which are used only one semester and are created on-the-fly by the instructor in response to what happens in the class, synchronously or asynchronously (see Bruns, Cobcroft, Smith, & Towers, 2007, p. 9). Synchronous sessions do have a structure, albeit a flexible one, because student feedback has repeatedly asked for and affirmed the usefulness of having some underlying parameters in which to create knowledge together. Students are more confident when they know that norms and structures exist about *procedures*, so they are more comfortable experimenting with *topical content*.

My synchronous sessions have always allowed for a backchannel (see Bruns, Cobcroft, Smith, & Towers, 2007, p. 9). When we only used text chat, the backchannel was primarily via private messages during chat sessions, supported by always-open e-mail and IM that I encouraged students to use during class (while discouraging them from opening backchannels with co-learners who do not like to do so). The change in 2007 to the Elluminate(TM) platform for synchronous sessions presented opportunities for more backchannel and sidechannel activities. I changed my own contributions from primarily text to primarily audio but students, for reasons of technology and anxiety, were slower to change. Now students and I use audio for discussions, accompanied by conversations in the text chat and interactions on the whiteboard space (the "sidechannels"). Private text chat messages, IM, and e-mail are still open for backchannels. This environment can be overwhelming, so some students opt to skip class and watch the recording later, but it provides the variety of options important for shared co-production of knowledge.

The course also includes asynchronous components. Weeks 2 -6 of the class are intensive asynchronous discussions about specific information retrieval systems (SYSTEM assignments). Students on their own would likely not find out about *these* systems and would not explore them even if they heard of them, but seeing long-term extremely large-

scale operational retrieval systems is important to understanding the subtleties of how to set up and use an information organization scheme even in the newest technology.

Through Fall 2005, the five SYSTEM assignments consisted of students answering 10 pre-assigned queries in each retrieval system (e.g., "Using Advanced Search, search for William Shakespeare by Subject. How many total hits? How many are books? How do the items found reflect the query you entered?"). Each student submitted his/her answers and were graded on how many were correct. In Fall 2005, the course was taught face-to-face (one of only two f2f deliveries between 2002 and 2010), and my reflections on the co-construction of knowledge finally clicked: we discussed in class the retrieval process and how it related to the information organization in each system, and described the problems encountered while searching. Starting in Spring 2006, the SYSTEM assignments changed online. For a different system each week for five weeks, students are given 10 queries AND the correct answers. Students run the queries, note their answers, and reflect on how the system's information is organized. Then students participate in intensive weekly discussions about each system. The instructor participates only slightly, allowing student problem-solving and course correction to proceed as far as possible (see also Saye, 1987, p. 36). Grades are based on the discussions, rather than getting the "right answer," and the grading outline encourages various production and use activities: asking *and* answering questions, expressing *and* allaying confusion, addressing the assigned questions *and* bringing in new topics, practicing brief writing (posts are limited to 300 words), and introducing metadata to organize information (by editing the subject lines of their posts).

The SYSTEM weeks also scaffold other behaviors, attitudes, and culture that will contribute to produsage. By the end of the SYSTEM weeks students are accustomed to using the public forum in class to ask and answer one another's questions, and they trust the instructor to give them space to engage in problem-solving and knowledge creation, but to contribute when those processes need guidance. They get accustomed to producing a variety of resources in various media. They get 50% of their grade for the course done within the first 6 weeks of a 15 week semester, so they feel less stress from the unknown of performance. They get accustomed to my grading practices and the nature of my feedback, which is detailed and fast. The produsage between me and each co-learner via the private feedback on their efforts is important because they know I am learning too, that I am part of the knowledge co-production; I can tell them things privately to aid their public performances, and it fosters trust in me, in each other, and in the grading process.

From a course topic perspective, the large successful information organization systems are also valuable resources that will help them later. The two other main assignments are papers, but the papers are supported by some "bridging" assignments (Contribute assignments, described below) that connect the SYSTEM assignments to the papers.

## **6.2 Evolving toward produsage**

A core course often comes at the beginning of a student's program, when it is helpful for them to develop metaskills for graduate study. I discovered that new students in this graduate program had difficulty incorporating the research and professional literature into

their papers. They had trouble finding the appropriate literature, did not know and could not tell the difference between scholarly and professional, and had difficulty incorporating other people's work into their own arguments. Students had these problems even after I reminded them to use the information retrieval systems from the five SYSTEM weeks to help them find appropriate materials for their papers.

Students suggested a solution: let them read sample successful papers from previous semesters. Absolutely not, I said: if I give you examples you will follow them, you won't have to engage in the difficult work of structuring your own thoughts, and the papers will all be similar and I will get bored reading them. It would be anti-learner-led and anti-produsage.

I thought of a way: I could build a sample bibliography of appropriate materials FOR them, so they could see the kind of things I was looking for... . No; everybody would cite the things I found, few new resources would find their way into our environment, and the new resources that students DID cite would be in their papers and only I would see them. Another anti-produsage solution.

Produsage? Produce and use! I decided to have the students co-produce a bibliography each semester, contributing citations to articles related to their papers. In a class that regularly enrolls 50 students, each student contributes 2 resources for each of the 2 papers they write, so each student has a bibliography of 100 items to choose from as they write each paper (they may incorporate materials not in the shared bibliography). This is not done as a wiki that accumulates across semesters because the information organization literature is small; there would not be 100 "new" things to add each semester.

This solution (the Contribute assignment) was good but in its first iteration did not go far enough. Gently guided by me, the learners kept leading the class to talking about social tagging as an information organization mechanism, and the class looked at many social tagging sites. But the class did not *do* any tagging, so the next semester, the Contribute assignment was adapted so the learners added tags to their contributed citations. They get experience tagging, and they experience using tags for retrieval when they are looking for appropriate articles to cite in their papers. They can compare their retrieval experience using tags with the prior retrieval experiences they had with structured systems that used "real" controlled vocabularies (thesauri or subject headings) to support topical retrieval. Finally, they can collect the tags from the contributed bibliography and examine the collection of tags as a folksonomy, and compare it with the controlled vocabularies explored earlier (see also Bruns and Humphreys, 2005, p. 6).

The course uses six types of discussion forums to support our activities; the SYSTEM assignments are completed via discussions, as explained above. The remaining 5 types are Faculty Office (FO), CAFÉ, SHARE, Questions About (QA), and DISCUSS. While the Blackboard(TM) discussion board infrastructure is difficult to use, it provides the needed private environment specified by my institution. For those not tethered to Blackboard(TM), the same types of forums can be implemented in other threaded discussion systems, blogs, or other social media settings.

Each discussion board has a content-oriented and a cultural purpose. The specific behaviors and attitudes encouraged by each discussion do not just affect the content of that discussion; they become cultural norms and standard practices throughout the whole course. For example, the SHARE forum provides a place for students to share information-organization-related items they find in their everyday lives, such as how information organization helped to capture U.S. serial killer Theodore Bundy (Keppel, 2004) or a realization that the reason they cannot find the chocolate syrup in the grocery store is, at heart, an information organization problem. SHARE also encourages students to take the knowledge they co-produce in class and use it in their everyday (not just work) lives.

When I began teaching the course I had a Faculty Office discussion for everything that fell outside each week's topical discussion. This led to two pedagogically unfortunate outcomes: one, the FO board became a mishmash of unorganized information, and thus a poor example of how to organize information. Worse, technology limitations kept the students from fixing the problem with their new information organization knowledge, although they wanted to. The second problem was that it acted like a "faculty office"! Interactions tended to be student-initiated and consist of the student asking a question and me answering. The culture was not yet there to encourage students to ask questions of the class, to encourage students to take a risk and answer each other's questions, or to encourage them to expect me to hang back while they built knowledge.

The Questions About (QA) discussions helped enormously, and there is a QA discussion for each assignment. They start out slowly, but once the students get accustomed to asking and answering questions in the SYSTEM assignments, the QA discussions get more active. They rely on a network of trust and allow us to co-produce knowledge far beyond what would happen through a series of two-turn dialogues. Students feel more comfortable co-producing knowledge in something called "Questions About" than in a Faculty Office. The FO is still needed, but it becomes a space for me to answer procedural questions that only I can answer.

### **6.3 Prodsusage and its impact on learning**

I am amazed every semester to watch students come into the class expecting a dry, boring, difficult, required course—and instead getting drawn in to a rich co-learning community where they are constantly producing knowledge inside and outside class, and exhibiting a level of trust in each other and in me that takes an amazingly short time to build when all of the pieces are in place. It took *time* to assemble all these pieces, and many semesters of taking knowledge produced in previous semesters and using it reflexively in building the new semester's "simulated city." Constant reflection throughout each semester is needed, and my own reflections are carefully compared with the anonymous feedback plus any personal feedback from students, and then combined with any technology upgrades to inform subsequent changes (see, e.g., Kazmer, 2000). To this is added things I have learned about pedagogy from others including faculty colleagues, at conferences, and through reading, but mostly from my students, many of

whom have instructional roles themselves and are happy to share their knowledge with me.

Some important contributions from students to the successful development over time of this scaffolded information organization class came through the end-of-semester course evaluations. The student feedback was organized into the following three categories: student confidence, instructor inputs, and course evolution over time. The responses echo the above discussions about the philosophy, design, and development of the class, thus reinforcing the cyclical produsage nature of the long-term development of the course.

Students feel confident and empowered by having co-created their knowledge and having applied it together in real-world technological and institutional settings. Students were more confident experimenting with the *content* when they could rely on the *structure* of the class explicitly creating and following a set of norms, such as how much time was allowed for chitchat during synchronous sessions (some) or how many ill-tempered discussion posts were permitted (none) (see also Bruns & Humphreys, 2005, p. 4). Students appreciated the instructor's deep knowledge of the subject and having that knowledge to fall back on made them more confident in their explorations into unfamiliar domains.

Students strongly appreciated the flexibility afforded by the learning environment, comprising a combination of available technologies and the instructor's flexibility, in allowing them to choose which media to use to contribute, via text or voice, synchronously or asynchronously. Absolutely vital to student success and student confidence was the willingness of the instructor to engage in knowledge co-production one-on-one with students through fast, detailed, iterative feedback on their knowledge performances.

Students frankly acknowledged, and explicitly said they were de-motivated by, the inherent boringness and difficulty of the material in this course. Alternatively, the instructor's personal enthusiasm and deep passion for the subject matter motivated students to work harder in the class and to find the topic of information organization more interesting.

Students strongly appreciated knowing, because they were told explicitly at the *beginning* of the semester, and again when they were completing course evaluations at the *end* of the semester, that course evaluations are used to make specific improvements to the course. They like knowing the course has been made better by the contributions of students who went before them, and they are gratified to know their own evaluations will be thoughtfully considered and actively used in future iterations. As a result, reflectively incorporating student suggestions into subsequent iterations of the course led to direct and explicit improvement in course evaluations and student and instructor satisfaction.

## **7.0 Conclusions**

This paper has presented a detailed discussion of the long-term development of a required course in information organization using a produsage, learner-led perspective. Although

this paper has focused on "a case," it has done so in a way that is not tied inextricably to specific technologies or delivery mechanisms but instead makes arguments that lead to "developing an overall pedagogy" (Bruns, Cobcroft, Smith, & Towers, 2007, p. 9). At the same time, although the study was longitudinal, and included the input of several hundred students over time, it also relied on one instructor, one educational institution, and one course. The detailed description of the learning environment, therefore, was provided as an assistance to application elsewhere, helping reveal what differences and similarities would be important and which might be relevant.

As all engaged in the learning venture look forward to the increasing incorporation of user-created content venues into the education process, it is important to consider the problematics of using open, publicly-available contributory tools (blogs, wikis, and other developing mechanisms of the *social web*). On one hand, it is important to incorporate the social web into learning for two reasons: first, because such tools are tightly interwoven into learners' life-worlds and they want to include them in their learning; and second, because it is important that learners practice engaging in knowledge co-construction in the "real" social web where they need to be careful of self-presentation and simultaneously are able to take advantage of the wide variety of knowledge outside their online classroom. In thinking through future iterations of the Information Organization class discussed in this paper, it would be interesting to be able to incorporate more aspects of the social web for these reasons (although the class as currently constrained replicates some aspects of the social web as noted, such as through the shared bibliography and tagging environment, and by exploring how information is "organized" in structural and ad hoc ways in publicly-available spaces such as YouTube and Wikipedia).

On the other hand, the context of learning may in some cases (and did in this one) impede the incorporation of the social web into a produsage learning environment. One must be mindful, especially when analyzing education across different countries or preparing to teach in a different country, that different policies or regulations may need to be heeded. For example, in the United States, the Family Educational Records & Privacy Act (FERPA) may or may not be interpreted correctly as shaping the use of open technologies in teaching. An educational institution may have unique policies based on an institutional understanding of FERPA that govern teaching practice within that institution and thus affect the uptake of publicly-available technologies like wikis, blogs, tagging services, etc. (Bruns & Humphreys, 2005, p. 6; Diaz, 2010). Such interpretation in a general sense is beyond the expertise of this author, and the arguments in the literature are split, but an interpretation of U.S. FERPA does provide the reason the social web has not been taken up more strongly in the course described within this paper.

The themes that appear through this analytic examination – from the conceptualization of produsage for learner-led education; from the learning environment, scaffolding, and flow of this course; and from the student evaluation inputs – are summarized as follows. The instructor must embrace the fluidity of roles inherent in this mode of learning, from being the designer of the unpopulated "simulated city" that the learners will shape throughout the class, to being a guide, a knowledge resource, and a co-learner who



produces knowledge with all the learners in the class. At the same time the instructor must have passion for the subject area, deep knowledge of the subject area, and thorough understanding of the knowledge-building processes within it. The remaining co-learners (students) in the class produce equally important knowledge, and one cannot be privileged over another. In a required and/or difficult class, the co-learners need support to build and recognize the value of their contributions. They must be confident and trusting for produsage to work, and that confidence and trust must be established, built, and fostered through interaction and feedback. The specific technological infrastructure in which this all occurs is not terribly significant, as long as the benefits and impediments of the technology are thoroughly understood, and the technology can be made to do what is needed by all the co-learners. For required, boring, and/or difficult courses, there are unique needs for guidance and motivation to keep learners from leading themselves into irrelevant but more interesting topics, or from giving up altogether.

Produsage-based pedagogy naturally leads to a very lightweight, tightly-integrated course structure in which everything is interconnected and no work is used only for one purpose. What is produced is designed to be used and is used, and the producer is the user. All knowledge processes are interconnected, reducing steps and eliminating intermediaries, and the system is almost waste-free. In the end, a successful produsage-based learner-led environment provides support—from the instructor, through technology, and among the co-learners—so that all the co-learners can proceed with confidence and a sense of community. Such a successful environment will lead to long-term deep learning through iterative co-productions of knowledge on the part of all the co-learners.

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