

**Report of the UC San Diego Senate-Administration
Advisory Group for the Information Literacy Theme**

July 2009

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I. Introduction

In preparation for the [WASC Educational Effectiveness review](#), the UC San Diego Senate-Administration Advisory Group for the Information Literacy Theme was charged with drafting a set of recommendations for the development of UC San Diego resources in the area of Information Literacy. This area is one of four themes identified by the 2005 Institutional Proposal for the WASC reaffirmation of accreditation review (the other three themes were Entry Level and Freshman Writing, Delivery of Foreign Language Instruction, and Undergraduate Program Review). The investigation of Information Literacy was proposed to focus specifically on new forms of electronic information and their role in student learning. Key issues were to include the development and management of “e-stores” (electronic materials such as books, journals, images, audio, maps and primary source data sets), the skills needed to critically evaluate and employ information assembled in such stores, the role of students as both consumers and creators of electronic information, and the use of learning management systems for optimizing such information in instructional settings.

While our Advisory Group’s investigation was informed by some of the core questions associated with discussions of “media literacy” in the 1970s and ‘80s, it was also necessary to take account of the dramatic transformations in information technology, social networking systems, and visual and media production that have occurred over the past twenty years. In 1932 the Hungarian photographer Laszlo Moholy-Nagy famously wrote: “The illiterate of the future will be ignorant of the pen and the camera alike.” Today we might say that the illiterate of the future will be ignorant of JSTOR and Photoshop. These shifts have fundamentally altered the way in which knowledge is produced and consumed on the university campus specifically, and within contemporary cultural more generally (from Twitter, DIY video production, and the pervasive manipulation of photographic images, to the challenges posed to existing criteria of accuracy and authenticity by the proliferation of scholarly information on the Internet).

The Advisory Group chose to reconfigure its focus from “Information Literacy” *per se* to “Digital Information Fluency” (DIF) in order to suggest a form of competence that includes the process of evaluation and interpretation and an expressive component, since one of the signal effects of digital technology is the increasing ease with which each individual can become a media producer as well as consumer. As a Research I university, our mission is to educate future leaders in their respective fields of study - scholars who will be disseminating their research across a wide range of audiences and contexts, and through an equally wide range of media, in a manner that demands the highest level of expressive and rhetorical proficiency.

The Advisory Group was formed in October 2008 and met regularly during the 2008-2009 academic year, completing its final report in July 2009. Our work encompassed several components, including surveys of existing Digital Information Fluency practices at UC San Diego, a review of Information Literacy initiatives on other campuses, and a series of extended discussions among committee members (comprising representatives from the undergraduate colleges, the Libraries, and various departments) who sought to frame the issue of DIF conceptually and thematically.

While there are certain programs and initiatives on campus that offer excellent models for DIF (e.g., Sixth College, courses in the Visual Arts, Cognitive Science, and Computer Science and Engineering departments, and workshops offered by the Libraries) there has, as yet, been no attempt to establish a comprehensive profile or structure for DIF-relevant activities at UC San Diego. While our review was not exhaustive, it did reveal a vibrant network of approaches, practices and initiatives that we can learn from and build on as we develop UC San Diego resources in the area of Digital Information Fluency for the future. Our findings, outlined below, present five key points:

1. Digital Information Fluency (DIF) should be viewed as an explicit component of undergraduate education at UC San Diego.
2. DIF should be integrated throughout the university's educational system, not sequestered within a single program, department, college, or unit.
3. DIF teaching should be accomplished through the campus' existing structures.
4. A working group is needed to incorporate DIF learning goals and outcomes throughout the UC San Diego curriculum.
5. A mechanism is needed to allow for ongoing dialogue around DIF.

The recommendations offered by the Advisory Group, which are presented later, are, by necessity, relatively general. The institutional ecology of UC San Diego is complex and multivalent, and the implementation of these recommendations will require an ongoing process of dialogue and exchange throughout the campus community. This interdisciplinary, campus-wide exchange must acknowledge the situational specificity of individual campus entities, while also retaining a more global understanding of the impact of digital technology on knowledge production in the university and within society as a whole.

II. Methodology

The Advisory Group met and corresponded throughout the Fall, Winter, and Spring Quarters of 2008-2009 to discuss and decide how to approach its charge strategically and efficiently. The group agreed to:

- research if and, if so, how Digital Information Literacy or Fluency is being defined and implemented in the educational vision of (1) our sister UC campuses and (2) other RU1 Research Universities;
- create surveys that help to establish a baseline of current teaching and learning practices in the area of Digital Information Fluency at UC San Diego. Because Digital Information Fluency issues permeate all aspects of a student's life at the university, we decided to query not only faculty (Academic Senate and non-Senate faculty) and librarians, but also Student Affairs professionals and instructional technology support staff.
- develop a reference list to survey current thinking and practice in the area of Digital Information Fluency.

For the purpose of efficient work management, the Advisory Group charged a smaller subgroup to develop a definition of Digital Information Fluency and its Learning Goals. Drafts of those documents were submitted to the larger Advisory Group for discussion, refinement and final approval. In addition, many Advisory Group members volunteered to conduct special assignments.

Sandy Beattie (Programmer Analyst) and Patricia Valiton (Special Project Assistant), of the Office of the Senior VC Academic Affairs, compiled and presented the Faculty Survey data in formats that allowed the detailed data analysis.

The complete report was submitted to the Advisory Group for final approval.

III. Findings

- A. What we learned from reviewing Information Literacy programs at other UC campuses and other campuses in the U.S.**
- B. What we learned from the surveys developed to establish a baseline of current teaching and learning practices at the UC San Diego Campus**
- C. What we learned from reviewing the use of Learning Management Systems (LMS) at other UC campuses**
- D. Literature and References consulted throughout our investigation**

A. What we learned from reviewing Information Literacy programs at other UC campuses and other campuses in the U.S.

The committee undertook a survey of Information Fluency (IF) programs at other large research universities in the U.S., including all the UC campuses.

Because the committee formulated a definition of information fluency built upon on strong digital/computer understanding, we were curious if any such programs existed at other institutions. We were aware of scores of traditional library information fluency programs, and, while there are many successful and outstanding ones, these programs are not generally focused on computer/technology fluencies. Rather, they foster skills that lead to the effective and ethical identification, navigation, evaluation, and communication of information. Computer skills are increasingly necessary for successful resource navigation, but traditional information fluency curricula tend to emphasize the information resources rather than the technology that supports them. Finally, we were curious to know if there were any existing programs that address digital/information fluency skills across the curriculum in a comprehensive or sequential manner.

Consequently, we were especially interested in identifying programs with the following criteria:

- those that have a major digital literacy component, and
- are deemed to be successful based upon an objective assessment process, and
- are integrated throughout the curriculum rather than as separate courses offered by the libraries.

Methods

To gather this information, we relied on the following approaches:

1. A call went out to a nation-wide listserv of information literacy librarians with a request for the above information.
2. A separate email/telephone poll of all the UC campus libraries was conducted.
3. A literature search for such programs was also conducted in library and educational databases and websites.

We identified several programs that met one or more of our criteria, and we set out to gather specific information, either by examining the institution's or library's website, or preferably, by identifying a contact person and asking a set of questions. We agreed that, for the purposes of our report, we would seek information from all the UC campuses, regardless of whether or not they met our criteria.

The questions we sought to answer for each of the institutions, whether in our website explorations or by personal contact, are listed below:

- How does your institution define information literacy/digital information literacy?
- How is your program implemented, e.g., optional courses/workshops, one course that everyone takes, integrated across the curriculum, a tutorial that everyone takes, etc.?
- Who is responsible for developing the learning goals, teaching/developing the content, and assessing the outcomes?
- Who has responsibility for managing the program?

Findings

University of California Programs

The UC campuses that we were able to poll all have some form of traditional information literacy program. That is, they are focused on skills that lead to the effective and ethical identification, navigation, evaluation, and communication of information. Most are managed by the libraries, and none has an identified digital component. Three are especially worthy of mention.

[UC Berkeley](#), because of its grant-funded Mellon Faculty/Library Fellowship for Undergraduate Research and its Undergraduate Student Learning Initiative (USLI), comes the closest to an integrated program across the curriculum. More information about this ambitious and successful program is available from the links in the appendix. Currently, the grant funding has ended, but parts of the program will continue.

[UCLA](#) has General Education clusters, and the librarians are involved with faculty in designing learning goals for traditional IF components of required classes. The library offers three for-credit courses which focus on IF goals, but are optional.

At [UC Irvine](#), all students are required to take lower- and upper-division writing courses in which the library is involved with an IF component.

Non-UC Programs

Of the non-UC institutions, three Information Fluency programs stand out – those of the University of Central Florida, Purdue University, and Cornell University.

The [University of Central Florida](#) has a campus-wide Information Fluency Office administered out of the Quality Enhancement Plan Office under the undergraduate studies dean. The campus chose to work on an IF project for its accreditation process and defines IF as encompassing and integrating three skills: information literacy, technology literacy, and critical thinking. Furthermore, their IF website notes that, “fluency means not just accessing information on the Web, but creating your

own Web pages. Not just downloading MP3 music files, but creating your own digital-music compositions. Not just playing SimCity, but creating your own simulated worlds.” (<http://if.ucf.edu/ifaq.php>). This concept of Information Fluency (IF) is the closest we have discovered to that developed by the current UC San Diego committee.

The University of Central Florida program includes the participation of the Library, which has developed a set of generic tutorials for faculty to incorporate in their courses. The use of the tutorials by faculty, while not mandatory, has increased since inception of the program. Assessments of student IF skills have been measured by various standard assessment tools, i.e. the ETS iSkills test (<http://tinyurl.com/2l9lf5>) and Project SAILS (<https://www.projectsails.org/sails/overview.php?page=aboutSAILS>).

At [Purdue University](#), the library is responsible for the managing the IF program; however, as of June 2009, a new faculty position will be created. As the Booker Chair for Information Literacy, this faculty member will work with upper administration to make inroads for information literacy campus-wide. The current library-based program also includes the Digital Literacy Collaboratory, a joint effort between the libraries and the campus IT department. Purdue also uses the ETS iSkills assessment tool.

Finally, [Cornell University's](#) Undergraduate Information Competency Initiative, based on UC Berkeley's program, is a partnership between campus IT, the Center for Teaching Excellence, and the libraries. The program's broad-based goals seek to “engage faculty, librarians, and academic technology staff in the establishment of a shared infrastructure for the teaching of undergraduate research; to embed research-based learning approaches in an array of courses; and to enable instructors to redesign courses to better connect faculty research and teaching, and to allow creative student discovery and mastery of research competencies.” (<http://infocomp.library.cornell.edu/?q=goals>). An annual week-long institute gives faculty a chance to learn ways to incorporate information competency skills into their learning goals. As of 2009, the program increased its focus on digital literacy, assessment, and collaboration.

While none of these programs is a perfect embodiment of what this committee envisions, there are individual elements from which we can learn in each – for example, University of Central Florida's high-level program management administered by the office of the undergraduate studies dean, grant funding for supporting IF programs at UC Berkeley and Cornell, and the all-important faculty/IT/library partnerships forged at several of the campuses surveyed.

B. What we learned from the surveys developed to establish a baseline of current teaching and learning practices at the UC San Diego Campus

The Advisory Group created surveys to establish a baseline of current teaching and learning practices at the UC San Diego Campus. The surveys targeted the following groups:

1. Academic Senate Faculty
2. Non-Academic Senate Faculty (NSF)
3. Librarians
4. Student Affairs Professionals
5. Technical Support Staff

B. 1-2: Academic Senate Faculty and Non-Academic Senate Faculty (NSF)

Background

The survey questions for the two faculty groups (Appendices B.1 and B.2) were developed to receive feedback about the four issues identified in the Advisory Group's charge letter:

- 1. Library E-Stores and Web Resources Usage:** *"The development and management of various academic 'e-stores' (electronic materials such as books, journals, images, audio, maps, and primary source data sets)." To explore if faculty use campus e-stores (created by the Library) and other web resources, we developed **Questions 7; 13 – 15; 28 – 30; 34**. Specifically:*

Questions 7, 8 and 34 explore how Library e-stores are being used and any issues that impact their use.

Questions 13 – 15 assess if faculty ask students to identify and post web resources (including library e-reserves) to the course website.

Questions 28 – 30 survey the types of web resources being used as teaching tools.

- 2. Digital Information Fluency Skills:** *"The skills needed to critically evaluate information assembled in such stores, understand its context, and utilize and apply the information." **Questions 16 – 18; 24 - 26; 31 –33; 35 – 38; 39 – 50** were developed to identify which specific information fluency skills and proficiencies are being explicitly taught and practiced. Specifically:*

Questions 16 – 18 assess if faculty teach what the Advisory Group has defined as "fundamental competencies" involved in posting textual and non-textual material on a course website.

Questions 24 – 26 survey if skills necessary to successfully submit various assignments electronically are being taught.

Questions 31 –33 explore if skills necessary to effectively locate and use web resources are being taught.

Questions 35 – 38 appraise if skills necessary to effectively use Library e-resources are being taught.

Questions 39 – 50 focus on if and, if so, how the following key information fluency competencies are being taught: (1) credibility and authenticity of Internet resources, (2) ethical use of data, (3) copyright issues related to the use of web material as well as to the posting of a student's own data, (4) Internet privacy issues, (5) Internet security issues, (6) citation styles, (7) social dimensions of digital technologies, and (8) social network etiquette.

- 3. Students as Digital Information Producers:** *“The development of students’ understanding that they are not only consumers of electronic information, but contributors and creators as well.”* **Questions 27, 52 – 54** were developed to identify if students are taught to use digital information and artifacts to create digital information and products and, if so, which specific skills are being taught and how this is accomplished. Specifically:

Question 27 merely tries to establish a sense of how common it is for faculty to ask students to create digital course-related material.

Questions 52 – 54 survey if faculty explicitly communicate and teach skills associated with becoming producers and creators of digital information.

- 4. Learning Management System and Website Usage:** *“Class and learning management systems for maximizing the efficient and effective use of such information resources in instructional settings.”* **Questions 1 –6; 9 – 12; 13- 15; 19 -21; 22 -23; 51** were developed to identify if faculty use and, if they do, what type of digital technology they utilize to deliver and/or enrich and track and manage course content, interact with students, and manage course logistics. The questions also try to identify issues that promote or interfere with the use of digital technology and hence its adoption rate. Specifically:

Questions 1 – 6, 8 explore the use of course websites.

Questions 9 – 12 survey the adoption rate of UC San Diego’s Learning Management System ([WebCt](#)).

Questions 13- 15 examine if students are being asked to contribute to the content of course websites.

Questions 19 – 21 explore the importance of live Internet access during class time.

Questions 22-23 survey the significance of e-submissions of course assignments.

Question 51 assesses the use of e-communication.

In addition:

Questions 55, 56 were developed to solicit data for the development of best practices.

Question 57 was developed to identify if generational differences exist.

Question 58 was developed to identify possible differences related to the academic field of the respondent.

Key Findings

I. Academic Senate Faculty

The survey was sent to 1,436 Academic Senate Faculty. We received 231 responses. A response rate of 16% might be sufficient for establishing a baseline for UC San Diego's overall faculty's opinion and teaching practices in regard to instructional technology and information fluency. Moreover, of our target audience, the 837 Main Campus faculty members, 182 responders identified themselves as Main Campus affiliates, indicating a response rate of at least 22% for this group. However, considering that there are most likely significant differences among different academic units, we suggest that these surveys be considered only first indicators of common teaching practices and use of digital resources, and we propose that more exhaustive studies should subsequently be conducted.

Most faculty members identified their affiliation with a specific academic unit. We therefore will also represent faculty members' feedback by their connection to a specific academic unit in some of the analyses. It is evident that the numbers by academic unit are even smaller. The results should therefore only be viewed as representing a trend that requires further examination.

Issue # 1: Library e-stores and web resources usage:

1. The survey indicates that library e-stores are not being used extensively for instructional (teaching) purposes by faculty members (Q7, Q34). Usage by students is also not very significant (Q13, Q30). Specifically:

- Only 59 of the 231 faculty members who responded to the survey use the library e- resources and if they do, they mostly take advantage of the textual reserves (Q7). Most faculty members (65%) also do not ask students to use the libraries' e-reserve materials (Q34).
- Only a small number of the 231 faculty who responded (i.e., 10%) ask students to post content on the course website (Q 13). Students hardly take advantage of the textual material available (6%) and seem to mostly use the library's non-textual material of the e-reserves (12%) (Q14).
- The vast majority of faculty instructors (90%) do not ask students to post material to the course website (Q13). Those who do, however, first and foremost ask students to post non-textual material created by the students themselves. Additional information posted by students is textual content available through the Internet, followed by non-textual Internet content and non-textual content (Q14).

It should be noted, however, that the professional schools – the [Graduate School for International Relations and Pacific Studies \(IR/PS\)](#) and the [Rady School of Management](#) – seem to be much more inclined to use the e-reserves. Among the undergraduate programs, the [Biological Sciences](#), [Physical Sciences](#), and [Engineering](#) are much less inclined to ask students to use the e-reserves (27%, 12%, and 18% respectively). Almost 50% of the [Arts and Humanities](#) and [Social Sciences](#) faculty ask students to use the e-reserves (Q34).

2. Web resources are more widely used. Roughly 60% of the 216 of the faculty who responded to these questions ask students to use material available on the Internet (Q28). The material used is overwhelmingly text (63%), followed by images (37%), data sets (28%) and video (23%). The overall usage of discipline-specific web applications such as BLAST and [ARTstor](#) is, not unexpectedly, small, only 12% (Q30).

Issue # 2: Digital Information Fluency Skills

The overwhelming majority of the faculty do not teach the skills associated with posting digital material on the website (Q16) or submitting material electronically (81%) (Q24). Although a higher percentage of faculty (31% and 23% respectively) teach how to locate and use Internet-related resources (Q31) or e-reserve services (Q35), the vast majority of faculty do not teach those skills.

Again, most faculty (between 70 – 80% – and this is true across all academic disciplines and the colleges) do not teach skills associated with the task of locating and effectively using web resources.

Among the critically important findings of the survey (Qs 39 – 50) is that digital information fluency skills are not being taught consistently or to the degree one should expect. Key concepts such as Internet privacy and security receive very limited attention. Attention to these topics varies by academic disciplines. Overwhelmingly, faculty members who teach those skills do this as part of their lecture. Very rarely do faculty members ask library staff to teach those skills. Specifically:

- Evaluation of credibility, authenticity and reliability of Internet resources are being discussed by only 44% of the faculty. Faculty from the Social Sciences and Engineering are more inclined to do so than faculty from the Physical and Biological Sciences or Arts and Humanities (5% and 6% respectively) and the colleges (6%) (Q39).
- The ethical use of data was taught by only 45% of the faculty. The academic discipline distribution shows the same pattern as above (Q39).
- Copyright/fair use issues are discussed by slightly fewer faculty members. Some 39% report that they provide guidance. The academic discipline distribution again follows the familiar pattern described above (Q39).
- Copyright issues related to students' own posting receives only minor attention. Only 16% of the faculty members address this issue, and, again the academic discipline distribution shows the familiar pattern described above (Q39).
- Internet security and privacy issues remain largely unaddressed in class. Again, the Social Sciences (16%, 21% respectively) and especially Engineering faculty (35%, 30% respectively) are more inclined to teach these issues than their counterparts in the Biological and Physical Sciences and Arts and Humanities (Q39).
- Citation styles are being discussed by only 51% of the faculty. The academic discipline distribution again follows the familiar pattern (Q39).

- Social network etiquette is being discussed by only 12% of the faculty, and again, Social Sciences and Engineering faculty seem to deem this topic more important than their counterparts in the Natural Sciences and Arts and Humanities (Q39).
- The political and economic aspects of information are addressed by 22% of the faculty. Analyzing the responses by academic field reveals that Social Sciences faculty members (32%) consider this more important than the Arts and Humanities and Engineering faculty (20%). The Natural Sciences and the Colleges faculty do not pay a lot of attention to this issue (7% and 4% respectively) (Q39).

Issue # 3: Students as Digital Information Producers

It is surprising that only 26% of the responding faculty ask students to produce digital material as course-related assignments (Q27). Similarly, only 20% of the faculty responders explicitly discuss that students too are producers and creators of digital information (Q52).

Issue # 4: Learning Management System and Website Usage

The overwhelming majority (79%) of the faculty have a course website (Q1). There are academic field-specific differences. Almost 47% of the faculty in the Natural Sciences, but only 25% of the Arts and Humanities and Social Sciences faculty, have a course website. Only 33% of the faculty use [WebCT](#) as the tool to create the website (Q2). The website is primarily used to post textual material, including the PowerPoint slides created for the course (63%) and links to Internet resources (54%) and video sites such as YouTube (18%) (Q4).

Most faculty members do not use a Learning Management System such as [WebCT](#) (76%) (Q9).

Most faculty respondents (90%) also do not ask students to post material on the course website (Q 13). Quality control issues – including the need to filter material before it is being posted, especially in large lecture classes – and copyright and overall course management issues are the most often quoted reason for not doing this (Q15).

Close to 44% of the responding faculty members use live web access while they are teaching (Q19).

About 40% of the faculty members require that students submit assignments electronically. Faculty who request paper submission most frequently state that e-papers are more difficult to grade and use for feedback (Q22).

Email is almost universally used as one form of faculty-student communication. However, 46% of the responding faculty also use course website tools, such as discussion boards, chat/IM and TritonLink applications (Q51).

Key Findings

II. Non Senate Faculty (NSF)

The survey was sent to 196 Winter Quarter Instructors, and 50 of those responded, for a response rate of 26%. Fundamentally, the NSF's responses mirror those of the Academic Senate Faculty.

However, there are noteworthy exceptions:

Issue # 1: Library e-stores and web resources usage

Significantly more NSF than Academic Senate faculty use the library-e-reserve (86% vs. 53%) (Q7). NSF also post more non-textual library content than faculty (21% vs. 14%), but seem to rely less on textual library resources (50% vs. 73%).

More NSF ask students to use material available on the Internet (Q28) for course related activities. This is also significantly higher than Academic Senate Faculty (78% vs. 60%).

Issue # 4: Learning Management System and Website Usage:

A higher percentage of the NSF (56% vs. 33% of Academic Senate Faculty) are using [WebCT](#) (Q2).

A higher percentage of NSFs teach students:

- how to post material on the course website (18% vs. 6%) (Q16)
- how to submit material electronically (28% vs. 19%) (Q24)
- issues related to the credibility and authenticity of internet resources (58% vs. 44%) (Q39)
- regarding copyright issues related to students' own postings (26% vs. 16%) (Q39)
- social network etiquette (26% vs. 12%) (Q39)
- the political and economic aspects of information (40% vs. 22%) (Q39)

More NSFs seem to take advantage of the discussion board, chat/IM and TritonLink-based communication tools than Academic Senate Faculty (55% vs. 46%) (Q51).

Some of these differences may exist because more NSF from the Social Sciences and/or Engineering responded to the survey.

B.3 – Librarians’ Survey

Background

Librarians who teach information fluency were surveyed (Appendix B.3). The survey questions for the librarians were developed to receive feedback about the four issues identified in the Advisory Group’s charge letter:

1. **Library E-Stores and Web Resources Usage:** *“The development and management of various academic ‘e-stores’ (electronic materials such as books, journals, images, audio, maps, and primary source data sets).”* To explore if librarians use campus e-stores (created by the Library) and other web resources we developed **Questions 15-17; 18-28**. Specifically:
 - a. **Questions 7-9** ask if librarians ask students to post materials to their course websites.
 - b. **Questions 15-17** survey the types of open web resources being used as a teaching tool.
 - c. **Questions 18-20; 28** explore how Library e-stores (including e-reserves) are being used as teaching tools and any issues that impact their use.
 - d. **Questions 22-27** assess if librarians ask students to use web resources and Library e-stores during instruction sessions and for assignments.
 - e. **Question 21** explores web applications used by librarians in their instruction.

2. **Digital Information Fluency Skills:** *“The skills needed to critically evaluate information assembled in such stores, understand its context, and utilize and apply the information.”* **Questions 10-12; 29-30; 32-52** were developed to identify which specific information fluency skills and proficiencies are being explicitly taught and practiced. Specifically:
 - a. **Questions 10-12** assess if librarians teach what the Advisory Group has defined as “fundamental competencies” involved in posting textual and non-textual material on a course website.
 - b. **Questions 29-30** appraise if skills necessary to effectively use Library e-reserves are being taught.
 - c. **Questions 32-36** survey if skills necessary to successfully submit various assignments electronically are being taught.
 - d. **Questions 37 –38** explore if skills necessary to effectively locate and use web resources are being taught.
 - e. **Questions 39 – 52** focus on if, and, if so, how the following key information fluency competencies are being taught: (1) credibility and authenticity of Internet resources, (2) ethical use of data, (3) copyright issues related to the use of web material as well as to the posting of a student’s own data, (4) Internet privacy issues, (5) Internet security issues, (6) citation styles, (7) social dimensions of digital technologies, and (8) social network etiquette.

3. **Students as Digital Information Producers:** *“The development of students’ understanding that they are not only consumers of electronic information, but contributors and creators as well.”* **Questions 53-55** were developed to identify if students are taught to use digital information and artifacts to create digital information and products and, if so, which specific skills are being taught and how this is accomplished. Specifically:

- a. **Questions 53-55** ask if librarians explicitly communicate and teach skills associated with becoming producers and creators of digital information.
- 4. Learning Management System and Website Usage:** *“Class and learning management systems for maximizing the efficient and effective use of such information resources in instructional settings.”* **Questions 1 –9; 13-14; 31-33** were developed to identify if librarians use and, if they do, what type of digital technology they utilize to deliver and/or enrich, track and manage course content, interact with students and manage course logistics. The questions also aim to identify issues that promote or interfere with the use of digital technology and hence its adoption rate. Specifically:
- a. **Questions 1-6** explore the use of course websites by librarians and the kinds (including [WebCT](#)) used.
 - b. **Questions 7-9** examine if students are being asked to contribute to the content of librarians’ course websites.
 - c. **Questions 13-14** explore the importance of live Internet access during class time.
 - d. **Question 31** assesses the use of e-communication.
 - e. **Questions 32-33** examine if students are being asked to submit assignments electronically.

In addition:

- **Question 56** was developed to compile a set of best practices.
- **Question 57** was developed to identify if generational differences exist.
- **Question 58** was developed to allow for additional information if applicable.

Key Findings

The survey was sent to 55 librarians who teach information fluency skills to students. We received 28 responses, for a response rate of 51%. Respondents were not asked to indicate for which discipline(s) they conduct information fluency instruction, so results cannot be correlated to the disciplines.

Issue # 1: Library e-stores and web resources usage:

- 100% of librarians who responded use Library e-resources for their instruction sessions (Q18), and 96% use resources on the open web (Q15). The most-used Library e-resources were indexing and abstracting databases (82%) and full-text databases (82%) (Q19). The most-used open web resources were general resources (68%) (Q16).
- 86% of librarians ask students to use Library e-resources for their assignments (Q25) and 82% ask students to use resources on the open web (Q22). Of the Library e-resources that students were asked to use, full-text databases rated the highest (96%) (Q26). Of the open web resources, general resources were rated highest (83%), followed by full-text databases (57%) and non-textual databases (48%) (Q23).
- 38% of librarians ask students to post materials to their course websites (Q7).
- Only 37% of librarians ask students to use the Library’s e-reserves for their sessions, but many indicated in their textual responses that they teach students **how** to use e-reserves in the event they might need this information for their other classes (Q28).

Issue # 2: Digital Information Fluency Skills

96% of librarians responded affirmatively to the following question: *Do you teach students how to efficiently locate and effectively use material available on the Internet for course-related activities?* (Q37). This finding is not surprising since, for librarians, locating and using material on the Internet is a core content of their instruction. Additional elements of information fluency are also being taught, although with less consistency (Qs 39-52):

- Evaluation of credibility, authenticity and reliability of Internet resources are being discussed by 93% of librarians.
- The ethical use of data was taught by 68% of librarians.
- Copyright/fair use issues are discussed by 78%.
- Copyright issues related to students' own posting receives less attention (33%).
- Internet privacy issues are addressed by only 30% of librarians, but Internet security issues are covered by 43%.
- Citation styles are being discussed by 89% of librarians.
- Social network etiquette is being discussed by only 7% of librarians.
- The political and economic aspects of information are addressed by 39% of librarians.

Additional findings related to digital information fluency include:

- The majority (75%) of librarians do not teach students how to post materials to their course websites (Q10).
- As stated above, many librarians teach students how to use the Library e-reserves even though they do not require that students use e-reserves for their instruction sessions (Qs 11-12).
- Only 22% of librarians ask students to submit assignments electronically (Q32). Of those who do, the majority are by email (75%), followed by a wiki (38%) (Q33). Since electronic submission by these means is straightforward, it is not surprising that only 7% of librarians teach students how to submit them (Q34).

Issue # 3: Students as Digital Information Producers

Almost half (46%) of librarians responded that they deliberately develop students' understanding that they are not only consumers of electronic information, but contributors and creators as well. Comments from respondents indicate that they cover a variety of concepts in their teaching (Qs 53-55):

- Students can contribute content to scholarly blogs, social networking sites, and Wikipedia and evaluate others' content.
- Anyone can contribute content to the web, so it's important to critically examine resources.
- Carefully craft web contributions, especially in blogs and Facebook, because information is cached and can live forever.
- Developing presentations that include film, sound, and images requires the same attention to IP issues and full citation of sources as [do] written materials.
- Encouragement of students' future contributions to "scholarly publishing through open access publications, understanding author rights, and evaluating publication vehicles through various tools for journal and author metrics."

Issue # 4: Learning Management System and Website Usage:

- The majority of librarians (75%) have course websites, but only 3 of the 28 responding librarians use a Learning Management System such as [WebCT](#) (Q3). Most use static HTML pages (81%), followed by a wikis (48%) and online tutorials (43%).
- 38% ask students to post material to their course websites (Q7), and 22% ask students to submit assignments electronically (Q32).
- 96% of librarians use a live web connection while teaching (Q13).
- The vast majority of them (93%) use email to communicate with students (Q31).

Terminology

Library terms used throughout this report include “e-resources,” “e-stores” and “e-reserves.” Two of these – e-resources and e-stores – refer to the body of electronic data available through the Libraries. These two terms are often used interchangeably. The e-reserves are available for specific purposes, as follow:

Library e-resources (also referred to as e-stores)

Any electronic resource managed or licensed by the UC San Diego Libraries and available through the Libraries’ websites, such as article databases (JSTOR, PubMed, Web of Science, etc.), image databases (e.g. ARTstor), library catalogs (e.g. Roger, Melvyl, etc.), e-journals, e-books, etc.

Library e-reserves

Materials requested by faculty to be available through the course reserves system and made accessible to students electronically.

B.4 - Student Affairs Professionals Survey

Background

The Student Affairs Professionals Survey (Appendix B.4) was developed to appraise if, and if so, how the four issues identified in the workgroup's charge letter are being addressed in the informal learning environment overseen by Student Affairs professionals. We hoped to receive feedback about the following:

1. **Library E-Stores and Web Resources Usage:** *"The development and management of various academic 'e-stores' (electronic materials such as books, journals, images, audio, maps, and primary source data sets)."* To explore if Student Affairs professionals use campus e-stores (created by the Library) and other web resources, we developed **Questions 9; 17 - 19; 20**.
Specifically:

Questions 9 and 20 explore if, and if so, how Library e-stores are being used and any issues that impact their use.

Questions 17 – 19 survey the types of web resources being used in support of Student Affairs program(s).

2. **Digital Information Fluency Skills:** *"The skills needed to critically evaluate information assembled in such stores, understand its context, and utilize and apply the information."* **Questions 14 – 16; 23; 23 - 25, 31 – 33, 34 -47** were developed to identify which specific information fluency skills and proficiencies are being explicitly taught and practiced.
Specifically:

Questions 14 – 16, 25 assess if Student Affairs professionals teach what the Advisory Group has defined as "fundamental competencies" involved in posting textual and non-textual material on a course website.

Questions 23 – 25 survey if skills necessary to successfully submit various assignments electronically are being taught.

Questions 28 –33 explore if skills necessary to effectively locate and use web resources are being taught.

Questions 34 – 47 focus on if, and if so, how the following key information fluency competencies are being taught: (1) credibility and authenticity of Internet resources, (2) ethical use of data, (3) copyright issues related to the use of web material as well as to the posting of a student's own data, (4) Internet privacy issues, (5) Internet security issues, (6) citation styles, (7) social dimensions of digital technologies, and (8) social network etiquette.

- 3. Students as Digital Information Producers:** *“The development of students’ understanding that they are not only consumers of electronic information, but contributors and creators as well.”* **Questions 7, 11 – 13; 51, 52 – 54** were developed to identify if students are taught to use digital information and artifacts to create digital information and products and, if so, which specific skills are being taught and how this is accomplished. Specifically:

Questions 7 (indirectly) and 11 – 13 try to establish a sense of how common it is for student affairs professionals to use material created by students for website use and if students are being asked to post material.

Question 51 surveys if persistent data storage (e.g. for an e-portfolio) is being provided.

Questions 52 – 54 survey if Student Affairs professionals explicitly communicate and teach skills associated with becoming producers and creators of digital information.

- 4. Learning Management System and Website Usage:** *“Class and learning management systems for maximizing the efficient and effective use of such information resources in instructional settings.”* Although Student Affairs professionals do not have course websites, many use websites for their specific programs. **Questions 1 – 6, 8, 11 – 13, 28 – 30, 47, 48 – 49** were developed to identify if Student Affairs professionals use and, if they do, what type of digital technology they utilize to deliver and/or enrich, track and manage program content, interact with students, and manage program logistics. The questions also try to identify issues that promote or interfere with the use of digital technology and hence its adoption rate. Specifically:

Questions 1 – 6, 8 explore the use of program websites.

Questions 11- 13 examine if students are being asked to contribute to the content of program websites.

Questions 28 – 30 explore if students are being asked to use material available on the Internet for programmatic events.

Question 47 surveys if live Internet is of programmatic significance.

Question 48 – 49 assesses the use of e-communication.

In addition:

Question 56 was developed to solicit data for the development of best practices.

Key Findings

The survey was sent to 19 Student Affairs professionals who oversee units with an explicit student development and informal learning/co-curricular program mandate: [College Deans of Student Affairs and Residential Life](#), [Career Services Center](#), [Counseling and Psychological Services \(CAPS\)](#), [Student Legal Services](#), [Student Educational Advancement \(SEA\)](#), [Student Life](#) and Student Affairs Resource Administration. We emphasized the hope that our survey would be shared with others in these units, so we do not know precisely how many Student Affairs professionals received the survey. At least 19 of them had an opportunity to respond.

Unfortunately, we only received five responses total, which allows us, at best, to suggest trends.

Issue # 1: Library e-stores and web resources Usage:

The survey indicates that Library e-stores are not being used. Most Student Affairs professionals take advantage of resources (textual material and images) available via the Internet (4 out of 5).

Issue # 2: Digital Information Fluency Skills

Student Affairs professionals do not teach the skills associated with posting digital material on the website (Q14) or submitting material electronically (Q25). Only one responded that he/she teaches how to locate and use Internet-related resources (Q31).

Digital Information Fluency skills are not being taught consistently (Qs 34 - 47). Although social network etiquette is not being discussed at all, other key concepts such as copyright and fair use issues and Internet security and privacy receive strong attention. Four out of five respondents report that they address/discuss these topics.

Issue # 3: Students as Digital Information Producer

Only one of the Student Affairs professionals explicitly discusses that students too are producers and creators of digital information (Qs 52-54). Students are not asked /allowed to post on Student Affairs professionals' websites (Qs 11 – 13), although the material created by the students is being used on those websites (Q7).

Issue # 4: Learning Management System and Website Usage:

Questions 1 – 6, 8, 11 – 13, 28 – 30, 47, 48 – 49

All Student Affairs professionals have a program website (Qs 1-6). Those websites have links to other web resources (Q8), and they contain material created by students (Qs 11 – 13).

Most Student Affairs professionals ask students to use material (text and images) available via the Internet (Qs 28 – 30). Live Internet access is not being used for any program activities (Q47).

Student Affairs professionals use a variety of e-communication tools. Email (100%), discussion forums (50%) and social networking sites (75%) are the most commonly cited ones (Qs 48, 49).

B.5 – Technical Support Staff Survey

Background

IT Technical Staff are colleagues who provide key instructional and/or general IT support in academic departments -- [Mechanical and Aerospace Engineering \(MAE\)](#), [Structural Engineering \(SE\)](#), [Linguistics](#), and [Cognitive Sciences](#), a college ([Sixth College](#)), a professional school ([IR/PS](#)), an academic school ([JSOE](#)), and in the [Staff Education and Development Unit](#). We surveyed a total of eight colleagues. The goal was to complement the information received from Academic Senate faculty and Non-Senate faculty. The survey questions (Appendix B.5) were reduced to fourteen and were asked as part of a phone interview. The questions were created to receive feedback about the following four issues:

1. Library E-Stores and Web Resources Usage: *“The development and management of various academic ‘e-stores’ (electronic materials such as books, journals, images, audio, maps, and primary source data sets).”*

We asked the following questions:

- Do students use e-reserves?
- Do faculty ask students to use digital material for course assignments?
- Do students use material from the web for course activities?

2. Digital Information Fluency Skills: *“The skills needed to critically evaluate information assembled in such stores, understand its context, and utilize and apply the information.”*

We asked the following questions:

- Are students taught how to post? If so, how?
- Do students submit assignments electronically? Are students taught how to submit?
- Are students taught how to locate and use internet materials for courses?
- Are the issues below being discussed, and do faculty members provide guidance for the following?
 - Evaluation of web resources
 - Ethical use of data
 - Copyright and fair use of information and data
 - Copyright of student work
 - Web privacy
 - Web security
 - Netiquette
 - Citation styles
 - Political and economic aspects of information and societal impacts

3. Students as Digital Information Producers: *“The development of students’ understanding that they are not only consumers of electronic information, but contributors and creators as well.”*

We asked the following questions:

- Do faculty members deliberately teach skills that allow students to become contributors and creators of electronic information? And, if it is being taught define the skills that should be taught and describe how they are being taught.

4. Learning Management System and Website Usage: *“Class and learning management systems for maximizing the efficient and effective use of such information resources in instructional settings.”*

We asked the following questions:

- Do your faculty members use course websites? If so, elaborate on the type, how they are being used, and who created the website?
- Do your faculty members use LMS? If so, which one(s)?
- Do your faculty members access the web live in class?
- Name the methods faculty members use to communicate with their students.

Key Findings:

Library E-Stores and Web Resources Usage

Four out of eight staff members confirmed that faculty ask students to use e-reserves; three did not know, and one stated that students are not being asked. Four respondents confirmed that students are being asked to use web material for course assignments. And three of the staff members reported that students are expected to use digital material for course activities.

Digital Information Fluency Skills

Only two interviewees responded that students are being asked to post to the course website. They also asserted that students do not need to be taught the necessary skills for this task. All staff members confirmed that students are being asked to submit assignments electronically (Turnitin.com; [WebCT](#), Sharepoint; drop-in folder in lab). Basically, all units expect that students know how to do this task, i.e., this skill is not being taught. It is also assumed that students know how to locate and use Internet materials for courses. Only two of the surveyed units seem to explicitly teach all ([IR/PS](#)) or almost all ([Cognitive Science](#)) of the following skills:

- Evaluation of web resources
- Ethical use of data
- Copyright and fair use
- Copyright of student work
- Web privacy
- Web security
- Netiquette
- Citation styles
- Political and economic aspects of information and societal impacts

Although all interviewees affirmed that evaluation of web resources, ethical use of data and fair use/copyright issues are being addressed in courses, many added that it is done "...with a few sentences at the beginning of the class, it's boiler plate stuff...."

Copyright of student work is an issue that – with the exception of IR/PS – is not being addressed. Many staff members added that this "... should be done."

Web privacy, web security, netiquette and citations styles are all explicitly addressed in courses taught by Cognitive Science (COGS 3) and the "political and economic aspects of information and societal impacts" are being taught in COGS 10. All other respondents confirm that those topics are not addressed in courses offered by their respective academic unit.

Students as Digital Information Producers

According to four (out of eight) surveyed staff members, students are being taught that they are producers and creators of digital information. Only one person pointed to a specific course (COGS 3) in which students learn the skills that "producers and creators of digital information should have" are being discussed. All other interviewees did not provide any details to this question.

Learning Management System (LMS) and Website Usage

All staff members confirmed that the faculty members they support use websites, which are either an LMS or a static website. According to the respondents, a small number of faculty members also use a wiki.

All reported that the creators of the faculty website can be the faculty members themselves, TAs, or staff.

All interviewees state that the information posted on the faculty websites are one or all of the following: PowerPoint, Internet (links, YouTube), or text.

Those who use an LMS are [WebCT](#) users. Seven staff members confirmed that faculty regularly access live Internet resources, mostly PowerPoint, video, images, data sets, and ARTstor. Only one of the interviewees implied that faculty rarely, if ever, use live Internet access.

According to the staff members, all faculty members use email to communicate with students. Those who use LMS use the embedded system. Very few use Facebook or a wiki.

C. Learning Management Systems (LMS) in Use at Other UCs

Adoption Rates

Campuses keep very different statistics. Some campuses collect course syllabi and count their adoption rates at near 100% because each course has a website with the instructor's syllabus. UC San Diego only counts courses that are actively used. Because of the inconsistent empirical methods, comparative data are not included. All use is voluntary, except where noted (UC Merced and only for grades).

UC San Diego LMS Statistics - [WebCT](#)

	Fall 2008	Winter 2009	Spring 2009
Courses	406	419	448
Enrollments	38,691	35,532	39,529
Distinct Users	20,428	18,970	19,592

Most Popular Elements

- Gradebook
- Posting of materials, syllabi
- Discussion groups/forums
- Assignment turn-in

All UC's are using some form of LMS with similar feature sets. All campuses have a degree of Student Information System (SIS) integration, with a few providing student pictures and submission of final grades through the LMS (or a tool presented through the larger framework). Systems by campus are noted below with more comprehensive information about UC San Diego. Because of the detail, UC San Diego appears to be decentralized. However, the primary LMS is used across all majors and divisions except in small pockets of graduate populations. Even in those areas where another system is used, those groups sometimes make use of the central LMS. Note that Blackboard (BB) owns three major LMS brands (Angel, WebCT and BB) that are converging into a single product.

LMS by UC Campus

FTE counts include only the primary LMS group, including manager, and are much fuzzier than suggested by the table below. Counts have not been evaluated by their respective campuses and only serve to create a very general picture for comparison's sake. In most cases, the LMS support groups draw on other units such as shared help desks, system administrators, database administrators, and computer operations staff not included in the counts below. For some campuses where the LMS has been in use many years and where instructional technology support is centralized, programmers might not be dedicated full-time to the LMS and might be spread across several instructional projects.

**Survey of UC Campus Use of Learning Management Systems
Spring 2009**

Campus	Primary LMS	Other (Current)	FTE/Resources	Notes
UC Berkeley	Sakai		20	Founding member of the Sakai Foundation with a significant programming investment. Past LMS packages used: Blackboard (BB), Prometheus (now BB)
UC Davis	Sakai	Homegrown system in ColdFusion. Reworking Sakai gradebook so last holdouts will migrate to Sakai.	10 + 2 programmers on loan	Active in the Sakai Foundation and development.
UC Irvine	EEE	Moodle – Extension also managed by central LMS group.	6 + 4 student programmers + 1 student QA assistant	EEE is a 14 year-old, homegrown, LAMP-based (Linux Apache MySQL PHP) system. Unique campus in that School of Medicine and Business use campus LMS.
UC Merced	Sakai		4	Using Sakai for grades is mandated. Unable to discern what percentage of time the 4 FTE spend on Sakai.
UC Riverside	Blackboard	Moodle – College of Engineering, Extension (transitioning slowly from BB)	3	Central IT services provide database and system administration.
UC San Diego	WebCT	<ol style="list-style-type: none"> 1. Angel – Rady School of Management 2. BB – Extension: contracts with BB for hosted solution 3. First Class – IR/PS is using internal mail system’s shared folders – simple but effective for their needs. 4. School of Medicine Web Portal - homegrown system 	3 - for the Main Campus, including Scripps Institution of Oceanography, (but not the Rady School of Management, Extension, IR/PS, or the School of Medicine, as noted in the previous column).	Moodle pilot underway. Central LMS group includes system administrator, database administrator, training support and primary faculty support second tier student support.

Campus	Primary LMS	Other (Current)	FTE/Resources	Notes
UC San Francisco	Moodle	Previous long-term user of WebCT	3	Currently contracting with outside vendor for hosted solution with intent to bring the service in-house.
UC Santa Barbara	Moodle		2 + 1 student programmer	Decided against Sakai after 2-year pilot. LMS activity only funds one programmer. LMS usage relatively new at UCSB (<5 years) largely because of resources.
UC Santa Cruz	Sakai	WebCT: Extension and main campus transitioning away from WebCT to Sakai	3.5 (only 1 career staff) + 4.5 students	
UCLA	Moodle	WebCT, Sakai (abandoning). Engineering and many other groups use homegrown systems.	3 for Common Collaboration and Learning Environment (CCLE) plus dept. resources	Moodle is UCLA's CCLE envisioned as a bridge between systems, not a wholesale replacement. Highly decentralized infrastructure and support. Departments run their own servers or use into the central system.

LMS Trends in the UC System

- **Open Source over Commercial Packages**

All campuses except UC Riverside are using open source learning management systems or are moving in that direction. Larger institutions such as Berkeley and UCLA see open source as philosophically compatible to their academic mission. Berkeley's, and now UC Davis', participation in the Sakai Foundation has influenced and continues to influence the project's survival. Smaller campuses can no longer afford what was only a few thousand dollars per year a decade ago and now demands licensing fees similar to other enterprise applications (tens of thousands of dollars, or the equivalent of one to several programming FTE). Further, the commercial LMS vendors have been reduced to essentially one provider of higher-education LMS software. Campuses have little ability to insulate themselves from consistent 10% increases per year and upgrades to underlying dependencies such as Oracle database software. Campuses are moving resources from licenses to programming staff.

- **Smaller Campuses, Shared IT Resources**

Smaller campuses are more likely to make use of central IT resources, such as shared system and database administrators. This limits these units' ability to rapidly deploy new features or versions, or to effectively troubleshoot complex LMS issues that require the help of the system, database and LMS administrators.

- **More Centralized LMS Units, Professional Schools & University Extension Separate**

It is very common among the campuses for professional schools and university extension to have their own LMS instance. This is likely due to the cultural approach common at business schools (high touch, demand for great customization) and non-affiliate populations served by university extensions. While matriculating students are many, it is much easier to manage an LMS without adding in tens of thousands of non-affiliates that turn over every six weeks. At institutions that allow open access, guest accounts can make up more than 25% of the user database. Faculty with control of open access to any self-registered system user often don't notice non-affiliate "lurkers." These members of the public keep up with the course online and aren't noticed until they ask the professor a question.

- **Supplemental Course Website Use, Limited Online Course Offerings**

UC campuses are similar in that course websites and LMS use are chiefly supplements to resident courses. While this has not changed since LMS packages were first adopted, the complexity and range of tools has expanded to include more media, especially (audio) podcasts and image-heavy PowerPoint. Other areas of recent growth include assignment collection, due to the integration with Turnitin.com. Some of the most recent faculty to turn to LMS include those whose departments have cut paper budgets for class handouts. Relegated to only supplemental use, LMS platforms are not being used for online course delivery except in very few cases, such as UC Irvine's summer school offerings. Nearly all UC Academic Senates appear to be completely opposed to the idea of online courses.

Instructional Technology at UC San Diego

UC San Diego is very successful when instructional technology adoption is viewed in terms of faculty participants divided by expenditures (software, hardware and FTE). Adoption of the central LMS service reaches roughly 70% of undergraduates each quarter. Of the features available, the biggest usage occurs among those that reduce the bookkeeping-type duties associated with teaching: managing grades, delivering handouts, making automatic plagiarism checks, and collecting assignments.

D. Literature/References

Articles are listed in the order received on the Advisory Group's wiki.

- "Information Literacy Competency Standards for Higher Education," American Library Association, September 01, 2006.
<http://www.ala.org/ala/mgrps/divs/acrl/standards/informationliteracycompetency.cfm> (submitted by Catherine Friedman)
- [Horton, Jr., Forest. "Understanding Information Literacy: A Primer."](#) (submitted by Benjamin Grinstein)
- <http://www.infolit.org/> (submitted by Stefan Llewellyn Smith)
- "REINVENTING UNDERGRADUATE EDUCATION: A Blueprint for America's Research Universities" by the Boyer Commission, 1998
<http://naples.cc.sunysb.edu/Pres/boyer.nsf/> (submitted by Bill Griswold)
- UC San Diego's CSE 3 course: Fluency in Information Technology
<http://cse.ucsd.edu/undergrad/courses/ugradcoursedes/cse3.html>
<http://www.cs.ucsd.edu/~ricko/CSE3/> (submitted by Bill Griswold)
- U.S. Dept. of Education's [NPEC Sourcebook on Assessment: Definitions and Assessment Methods for Communication, Leadership, Information Literacy, Quantitative Reasoning, and Quantitative Skills](#), see Chapter 5, p 19-23, Tables C-1 & D-1. 2005. (submitted by Christine Bagwell) | [Summary](#)
- "Information Literacy: Definitions and Models," by Sheila Webber and Bill Johnston. Part of a larger website called "The Information Literacy Place."
<http://dis.shef.ac.uk/literacy/definitions.htm>. (submitted by Susan Shepherd)
- "Information Literacy: Essential Skills for the Information Age," 2nd ed., by Michael Eisenberg et. Al., Westport, Connecticut, Libraries Unlimited, 2004.
[Amazon link](#)
[Roger record](#)
See especially Chapter 1: [Defining Information Literacy.pdf](#), which defines information, visual, media, computer, digital, and network literacy. (submitted by Susan Shepherd)
- A comparison of the accuracy of science entries in Wikipedia versus Encyclopaedia Britannica
[Giles, J. Special Report: Internet encyclopaedias go head to head. *Nature*, 438, 900-901.](#)
(submitted by Gail Heyman)
- [Digital Literacy at SixthCollege](#). December 9, 2005.
[Digital Literacy Learning Goals for Sixth College Students](#) (submitted by Gabriele Wienhausen)
- "Being Fluent with Information Technology" Computer Science and Telecommunication Board; National Research Council ([PDF excerpt](#)) | [Full e-versions](#) (submitted by Christine Bagwell)
- [Information Literacy in the California Content Standards \(Information Literacy Lit K-12 Standards\)](#) (submitted by Gabriele Wienhausen)
- [The Nordic Journal of Information Literacy in Higher Education](#) (submitted by Christine Bagwell)
- [Perspectives on History: Intersections: History and New Media](#). 47:5, May 2009. (submitted by Gabriele Wienhausen)
- ["Finding Context: What Today's College Students Say about Conducting Research in the Digital Age."](#) Alison J. Head and Michael B. Eisenberg, Project Information Literacy Progress Report, University of Washington's Information School, February 4, 2009. (submitted by Catherine Friedman)

IV. Conclusions

- A. Digital Information Fluency Defined**
- B. DIF Learning goals**
- C. Existing UC San Diego Courses and Initiatives with Some DIF Components**
- D. Examples of Collaboration between Faculty and Librarians**
- E. [Examples of Extending DIF Contributions beyond the Classroom](#)**

The Advisory Group was charged to explore “... *how other educational institutions and organizations have defined and approached the broader concept of information technology literacy and, as appropriate, what strategies and /or best practices they have identified for promulgating the concept in the higher education setting.*” Early in their deliberations, group members reached the consensus that although many skills and issues associated with traditional information literacy (e.g., the ability to find and establish the veracity of information, the ability to identify suitable data to support an argument, etc.) have remained constant, the greatly enhanced ease of retrieval and reproduction permitted by digital technologies and the rapid growth in production and availability of digital information have led to transformative changes that require new ways of approaching and thinking about literacy in the digital environment.

Therefore, the group identified the term “Information Literacy” as too narrow and decided to reconfigure its focus to “Digital Information Fluency.” This created the need to define Digital Information Literacy (DIF). We surveyed our sister UC campuses and other research universities. Unable to locate an existing definition for DIF and consequently DIF learning goals, group members proceeded to draft a definition with recommended learning goals.

The proposed DIF definition and its associated learning goals (see Sections A and B, below) are described in relative general terms. This was done intentionally as an acknowledgement that each academic unit should have an opportunity to align DIF learning goals with the overall specific learning goals of their academic majors.

In Spring 2009, AVCUE Sawrey invited Co-Chair Wienhausen to address a meeting of the Council on Undergraduate Education (CUE) to update the Council on the Advisory Group's progress. After hearing her presentation on the Advisory Group's findings, CUE members were amenable to the suggestion that departments and programs consider incorporating DIF learning goals into the learning objectives that have been developed for each degree program.

The group felt compelled to highlight that UC San Diego already offers numerous courses in which one or more (of what the group defined as) DIF learning goals are being addressed (see Section C below). As these courses were designed prior to this report, not in response to it, they most likely will not fully realize the stated learning goals. Furthermore, the alignment of the courses with the DIF learning goals should be viewed as a first crude attempt. This is a process that requires intimate course content knowledge and should therefore be done by the course instructor. The collection of existing courses presented in this report is far from being a comprehensive list. Still, it illustrates that many of our UC San Diego faculty are teaching courses that address what the advisory group has defined as DIF learning goals.

In addition, we gathered examples of collaboration between the librarians and instructors that exemplify ways in which through pedagogical changes alone courses were reformatted to address some of the DIF learning goals (see Section D below).

Furthermore, we wish to point to one specific reference: the May 2009 volume of [*Perspectives on History*](#), the newsmagazine of the American Historical Association, is completely dedicated to “History and New Media.” One of the articles, written by UC San Diego Professor Stefan Tanaka, explores the impact of digital media in the field of history. Tanaka states that “... data is growing exponentially and the nature of that data is also changing.... We can find more facts, but we can also ask different

questions.” He concludes that “... there is possibility for enriching history by using digital media.” This example highlights that the time is ripe for cross-disciplinary discussion about digital information literacy in the curriculum (see Section E, below).

Last, but not least, we all were reminded that learning takes place inside and outside of the classroom. Teachable moments present themselves, for example, when first-year students move into their residence halls. Currently, during student move-in, [Academic Computing & Media Services](#) distributes fliers and website information that address issues of copyright and fair use of digital information (see Section E, below). One could easily imagine that this relatively passive introduction of one of the key aspects of DIF could be significantly enhanced through a specifically designed short workshop.

A-B. Definition of Digital Information Fluency (DIF) and Learning Goals

Preface

The underlying nature of Digital Information Fluency is generic, yet its expression in tools and practice can be highly varied across disciplines. Thus, the information literate psychologist might encounter Digital Information Fluency challenges in an engineering setting – and *vice versa*. Yet, the psychologist and engineer should be equally capable of understanding a digital technology article in the popular press.

Thus, the following definitions and learning goals are structured to accommodate this variability built on common concepts. First, common *Foundational Competencies* are distinguished from “higher level” competencies, which are likely to possess a greater disciplinary character. Second, the following definitions and learning goals are stated at a high level, with the purpose of leaving room for them to be elaborated in a way appropriate to their context of application, such as a college or a department’s major.

To counter the problem that these high-level definitions and learning goals are necessarily vague, included are *examples* of existing courses at UC San Diego that illustrate just *one way* in which these might be realized in a concrete form. As stated before, these courses were designed prior to this report, not in response to it; they therefore may not fully realize the group’s stated learning goals.

A. Digital Information Fluency (DIF) Defined

Digital Information Fluency can be defined through a system of three interrelated competencies:

- ***Foundational Competency***
The first competency consists of a basic knowledge of computing and the lifecycle of digital information, the skills involved with the identification, navigation, evaluation and communication of digital information, and the facility to participate in and contribute to digital communities.
- ***Conceptual Competency***
The second competency includes an understanding of the history, development and general structural features of digital technologies and digital information, an understanding of methods and techniques that can be used to represent information, and the ability to comprehend the rhetorical strategies used in text-based and multimedia arguments.
- ***Expressive and Rhetoric Competency***
The third competency involves the ability to use digital information and artifacts in the creation and communication of meaningful arguments in the digital environment.

Taken in the aggregate, the three competencies constitute an unfolding intellectual and academic progression that occurs as a result of a student's full educational experience as an undergraduate at UC San Diego, i.e., throughout a student's undergraduate curriculum, and culminates in their graduating with recognizable Digital Information Fluency skills.

B. DIF Learning Goals

Foundational Competency

The first competency consists of a foundational knowledge of computing and the lifecycle of digital information, the skills involved with the identification, navigation, evaluation and communication of digital information, and the facility to participate in and contribute to digital communities.

Learning Goals

1. Student has a basic knowledge of computing that includes understanding the structural features of information systems¹ and the lifecycle of digital information².
2. Student is able to select appropriate discovery tools to meet information needs, can identify appropriate Internet resources to use, can formulate search queries to effectively extract results, and can critically evaluate the credibility and significance of Internet sources.
3. Student understands the principles of copyright and his/her rights as a creator of information, follows those principles by using accepted practices of attribution of sources, and knows the conditions for and consequences of infringement.
4. Student has a basic understanding of digital content production principles and techniques³.
5. Student has an awareness of social norms and sufficient technical skills to successfully and ethically communicate and collaborate in a virtual environment.

¹ Structural features of information systems include hardware and software components, interfaces, databases; consistency; availability, persistent storage, archiving, audit trails, security, privacy and their technological underpinnings.

² Digital information lifecycle elements include creation, accessibility and preservation.

³ Digital content production principles and techniques include how different software packages can be used to format and display information and how different production techniques can be used for different effects.

Conceptual Competency

The second competency includes an understanding of the history, development and general structural features of digital technologies and digital information, an understanding of methods and techniques that can be used to represent information, and the ability to comprehend the rhetorical strategies used in text-based and multimedia arguments.

Learning Goals

1. Student understands the societal dimensions (e.g. historical, political, cultural, and economic) of digital technologies and digital information.
2. Student understands the general methods and techniques for presenting information and understands that digital representations of information have limitations.
3. Student can compare and distinguish between the structure and impact of the rhetorical strategies commonly used in formal written arguments and those used in multimedia arguments.

Expressive and Rhetoric Competency

The third competency involves the ability to use digital information and artifacts in the creation and communication of meaningful arguments in the digital environment.

Learning Goals

1. Student can apply the fundamental design principles that inform the creation and efficacy of digital media artifacts.
2. Student is able to create and identify patterns and interpretations of digital information and data to validate their own analysis.
3. Student is able to create and produce digital media artifacts to support different rhetorical strategies.
4. Student is able to make effective visual/auditory multimedia arguments.

C. Existing UC San Diego Courses and Initiatives with Some DIF Components

Several existing courses and initiatives on campus already include the teaching of some aspects of Digital Information Fluency. These activities serve as examples of practices and models already in place that can be learned from and built upon. The list is not exhaustive, and by including these we are not implying that they fully teach the range of DIF competencies or fully meet the learning goals identified by the Advisory Group. Instead, these serve as examples of activities that might be leveraged for this purpose through a re-envisioning of the manner in which they are being taught or slightly altering the content presented. Those activities that take place outside of the classroom also have the potential to be used to support the building of DIF competencies, either by connection with a course or independently.

Based on survey information we received and a cursory review of these courses and activities, there seem to be more courses or initiatives that address Foundational or Conceptual Competencies rather than Expressive and Rhetoric Competency, but a more thorough analysis of campus activities would be necessary to determine if this were true.

Courses that teach some aspect of Competency A: Foundational Competency

The first competency consists of a foundational knowledge of computing and the lifecycle of digital information, the skills involved with the identification, navigation, evaluation and communication of digital information, and the facility to participate in and contribute to digital communities.

- [BENG 1](#) – Introduction to Bioengineering
 - *Course content: Introduction to information access, communication, ethics and social responsibility*
 - *Class session content: Librarian-led session on finding and evaluating information resources;*
 - *Online tutorial content: Librarian created online tutorial covering how to find and evaluate information resources*
- [BILD 10](#) – Fundamental Concepts of Modern Biology
 - *Class session content: Librarian-led session plus online guide that covers finding and evaluating information*
- [CHEM 187](#) – Foundations of Teaching and Learning Science
 - *Librarian-led session on finding and evaluating information resources*
- [CHEM 188](#) – Capstone Seminar in Science Education
 - *Librarian-led session on finding and evaluating information resources*
- [CHEM 192](#) – Senior Seminar in Chemistry/Biochemistry
 - *Course content: Understanding and using the chemical literature (course co-taught by librarian)*
- [COGS 3](#) - Introduction to Computing
 - *Course content - Introduction to computers and how they can be used*
- [COGS 8](#) - Hands-on Computing
 - *Course content - Fundamental concepts of algorithmic thinking and design*
- [CSE 3](#) - Fluency in Information Technology
 - *Course content - Introduction to concepts and skills necessary to effectively use information technology*

- [ECON 120A,B,C](#) – Econometrics
 - *Course content- Introduces the science of statistics and provides the building blocks necessary to construct rigorous econometric analysis, including basic statistics, probability rules, and the formal methods used by statisticians to learn about the real world from data*
- [ICAM 40/VIS 40](#) - Introduction to Computing in the Arts
 - *Course content - Introduction to the uses and precedents for the use of computers in art making*
- [LING 105](#) - Law & Language
 - *Class session content – Librarian-led session on finding and evaluating information*
- [MAE 1](#) – Introduction to Mechanical Engineering
 - *Class session content – Librarian-led session on finding and evaluating information*
- [MAE 05](#) - Quantitative Computer Skills
 - *Course content - Use of computers in solving problems*
- [MAE 156](#) – Fundamental Principles of Mechanical Design
 - *Class session content – Librarian-led session on finding and evaluating information*
- [POLI 30](#) - Political Inquiry
 - *Course content - Introduction to quantitative analysis, including research design, data collection, data description and computer graphics*
- [POLI 102G](#) - Special Topics in American Politics - Data Analysis
 - *Class session content - Librarian-led session plus online guide that covers finding literature to support data interpretation*
- [POLI 115A](#) - Gender, Politics, and Globalization
 - *Class session content - Librarian-led session on finding and evaluating information*
- [PSYC 6](#) – General Psychology Social Foundations
 - *Course assignment - Students create a wiki-type page related to the class materials*
- [SE2](#) – Structural Materials
 - *Course assignments – Students use print and online library resources to enrich laboratory learning about properties of materials*
 - *Class sessions – Librarian-led class sessions on finding and using appropriate engineering information resources*
- [VIS23](#) - Information Technologies in the Arts
 - *Course content - Fundamentals of art historical practices such as writing and compiling bibliographies with traditional and online resources*
 - *Class sessions - Librarian-led class sessions on compiling bibliographies and finding and evaluating information*

Courses that teach some aspect of Competency B: Conceptual Competency

The second competency includes an understanding of the history, development and general structural features of digital technologies and digital information, an understanding of methods and techniques that can be used to represent information, and the ability to comprehend the rhetorical strategies used in text-based and multimedia arguments.

- [BIBC 115](#) - Computer Programming in Biology
 - *Course content - Use of computer programming in the analysis and presentation of biological data*

- [BICD 162](#) - Critical Reading and Writing in the Biological Sciences
 - *Course content - How to interpret results and write a paper that summarizes scientific research*
- [BIEB 100](#) – Biometry
 - *Course content - Application of statistics to biological problems*
- [COGS 187](#) - Cognitive Aspects/Multimedia Design
 - *Course content - Cognitive basis of successful multimedia design; what makes an interactive system effective*
- [COGS 187B](#) - Cognitive Aspects/Multimedia Design II
 - *Course content – Probes more deeply into concepts covered in 187A*
- [COGS 188](#) - Representation, Search & the Web
 - *Course content - Computational methods for finding and exploiting structure across data corpora*
- [ECON 120A,B,C](#) – Econometrics
 - *Course content - Introduces the science of statistics and provides the building blocks necessary to construct rigorous econometric analysis, including basic statistics, probability rules, and the formal methods used by statisticians to learn about the real world from data*
- [ICAM 40/VIS 40](#) - Introduction to Computing in the Arts
 - *Course content - Introduction to the uses and precedents for the use of computers in art making*
- [SOC 60](#) - The Practice of Social Research
 - *Course content - Principles of social research design*
- [SOC 103M](#) - Computer Applications to Data Management in Sociology
 - *Course content - Develop skills in computer management and analysis of sociological data*
- [VIS 70N](#) - Introduction to Media
 - *Course content - Technical foundation and theoretical context for production-oriented film and video studies*

Courses that teach some aspect of Competency C: Expressive and Rhetoric Competency

The third competency involves the ability to use digital information and artifacts in the creation and communication of meaningful arguments in the digital environment.

- [SOC 105](#) - Ethnographic Film
 - *Course content - Media Methods*
- [SOC 109](#) - Analysis of Sociological Data
 - *Course content - Application of scientific method, interpretation of statistical results, and clear presentation of research findings*

D. Examples of Collaboration between Faculty and Librarians

The libraries have been contributing to the teaching of DIF as defined above via the three modes: (1) providing direct instruction embedded in a departmental course, (2) giving workshops, and (3) instructing via on-line tutorials. Examples for each one of these approaches are:

- Instruction imbedded in courses
 - [BENG 1](#), [BILD 10](#), [LING 105](#), [POLI 102G](#), [POLI 115A](#), [VIS 23](#): See descriptions of individual courses above.
- Workshops
 - [Find It Fast: Library Instruction for Busy People](#): *covers basics of finding information using online resources.*
 - [Organizing and Writing with RefWorks](#): *covers use of RefWorks software to organize research and maintain references.*
- Online Tutorial
 - [Get Started: Where Students Start Their Research](#): *covers how to use online research tools.*

Short Descriptions

We have included a few specific examples to demonstrate that changing how a course is being taught allows teaching DIF competencies without changing the course content or increasing the need for additional resources. These pedagogical changes were possible because a faculty member and a librarian established a creative partnership:

SE2: <http://libguides.ucsd.edu/content.php?pid=41112&sid=302560>

Because of limited class time, the faculty member teaching the course was reluctant to spare the time for an in-class lecture. Therefore, the librarian presented 10 hands-on sessions outside of class time, and students attended one that fit their schedules. The sessions used the class assignments to help students investigate the e- and print resources that would lead them to the information needed, whether property data or test methods or an article on the history of aluminum beverage cans.

BILD 1 Wiki: <http://ucsdbild1.wetpaint.com/>

This supplemental instruction was online only (via the wiki) and had no in-person component. The librarian created this wiki to support the BILD 1 video projects. She selected online resources from the library's collection that she thought would be valuable for this project. She also included information about how to evaluate websites and cite sources. She has updated this each year (2007 and 2008) with new resources. The librarian had no face time with students for this class. She drafted an e-mail introducing herself and informing students about the wiki, and the email was sent to students via the professor.

BILD 10: <http://ucsd.libguides.com/bild10>

This guide supplemented in-person instruction that the librarian did for one lab section of BILD 10. The students had a debate assignment that required the use of many different resources – including some that are not traditionally searched by biology students. The in-class exercises are also included on a tab for reference. For this class, it was important that students understand the different types of resources (websites, books, newspapers, journal articles) and what types of information they could expect from them. Another tab, “doing the research,” presents the types of resources in the order recommended as students consulted them for projects. The final set, “journals,” includes links to several databases, including some non-science ones.

BENG 1: http://biomed.ucsd.edu/dturnbow/beng1_tutorial/player.html

This class is required by all bioengineering majors and is very large – about 275 students. For this class, the Library has traditionally offered in-person workshops that are offered outside of regular class time over a one-week period during 4th week. The students are assigned a paper about a broad bioengineering topic. The professor has described this paper as a vehicle for stimulating students’ thinking about bioengineering and how it applies to the world. Since most of the students are Freshmen and have never used the Libraries before, these workshops provide a general overview of the UC San Diego Libraries and include some instruction about types of literature (primary, secondary) and selecting databases to search as well as some search strategies that they can use for their papers. Enrollment for this class increases each year. Since the library can accommodate only about 20-25 students per library workshop, it has become increasingly difficult for us to provide in-person workshops due to the limitations of staff resources. For example, this year the library would have had to offer 14 one-hour workshops over five days.

In Winter Quarter 2009, two librarians conducted a study (with permission of the course faculty). They split the class in half so that one group attended the in-person workshops as usual, and the other completed the online tutorial. The workshop and tutorial included the same content and practice exercises throughout. All of the students, regardless of method, completed the same online quiz at the end. In addition, they were asked to complete a short evaluation about how they “felt” about the in-person workshop or tutorial. The librarians compared the quiz results of the two groups and learned that students scored equally on all questions, regardless of method. The librarians also learned that students typically liked the method in which they received the information. A final survey at the end of the quarter revealed, however, that students were more likely to use the library in the future for other classes if they attended the in-person workshop (perhaps as a result of the affective nature of teaching...the connection students feel when they meet an instructor in person).

E. Examples of Extending DIF Contributions beyond the Classroom

- In a recent article in [*Perspectives on History*](#), the newsmagazine of the American Historical Association, UC San Diego professor Stefan Tanaka discusses the ways in which history may be enriched by using digital media. The publication of a timely article in the special May 2009 issue devoted to “History and New Media” encourages cross-disciplinary discussion about digital information literacy in the curriculum.
- During student move-in, [Academic Computing & Media Services](#) distributes fliers and posts website information that covers issues of copyright and fair use of digital information. This relatively passive introduction of one of the key aspects of DIF could be significantly enhanced through a specifically designed short workshop.

V. Recommendations

Recommendations for: “...how the campus should leverage and develop its investments in this area (information literacy)”

It is clear that many of the skills and issues associated with traditional information literacy (e.g., the ability to find and use information in ethical and legal ways, the ability to establish the veracity of information, the ability to identify suitable data to support an argument, etc.) remain constant today. At the same time, they have been altered and intensified by the greatly enhanced ease of retrieval and reproduction permitted by digital technologies and by the rapid growth in production and availability of digital information. We think these changes should be considered transformative, and as such they require new ways of approaching and thinking about literacy in this environment.

Being information fluent today requires those traditional skills and, among other things, an understanding of the principles and structure of a database; the roles of operating systems; how software interfaces and networks work; the underlying principles of encoding information in binary form; issues such as privacy, security, copyright and online etiquette; and the ability to select and effectively use appropriate presentation and publishing technologies. In other words, today’s students have to become competent in Digital Information Fluency (DIF). Without it, students graduating from UC San Diego would not have the intellectual tools necessary to critically assess and use information, to create new knowledge, and to become lifelong learners.

One of the key lessons learned by the Advisory Group was that our cross-campus discussions, i.e., discussions that included members of diverse academic departments, librarians, and student life and technical support units, were essential to our developing a shared understanding of the meaning of Digital Information Fluency and how it should be approached at UC San Diego. By engaging in those discussions, we came to agree that teaching DIF should be viewed as a collective responsibility, that there is a need to intentionally teach it, and that we should identify how existing resources could be fully leveraged through existing structures and campus partnerships to teach DIF competencies.

Recommendations:

1. Digital Information Fluency should be an explicit expectation of every graduating UC San Diego student. It should be viewed as an intellectual and academic progression that occurs as a result of a student’s full educational experience as an undergraduate. By graduation, each student should have acquired Digital Information Fluency.
2. Teaching the skills and conceptual abilities associated with Digital Information Fluency should be accepted as a communal UC San Diego responsibility. It should not be taught through one specific course nor sequestered within a single program, department, college, or unit, e.g., College Writing Programs or the Libraries.

3. Teaching Digital Information Fluency and supporting students as they acquire DIF competencies should be accomplished by leveraging and enhancing existing structures and by re-envisioning the manner in which we teach, not by developing new structures.
4. The Offices of the Associate VC for Undergraduate Education and the University Librarian should establish a workgroup that is charged to:
 - a. Develop and employ strategies for implementing Digital Information Fluency learning goals and outcomes (as suggested by the *Senate-Administrative Advisory Group for Information Literacy*) within all academic majors, taking into consideration:
 - o students enter UC San Diego as Freshmen or as Transfer Students;
 - o the recent WASC accreditation process during which all academic divisions established learning goals.
 - b. Identify methods that enable the assessment of students' DIF competencies and the overall effectiveness of how DIF is being taught.
 - c. Develop and employ strategies for coordinating and monitoring DIF activities across the campus; explore the need for a designated DIF Coordinator to coordinate and monitor campus DIF activities.
 - d. Query the usefulness of a DIF resource portal (possibly kept up-to-date by a Digital Information Fluency Coordinator).
 - e. Investigate how best to promote existing resources, including academic e-stores available through the Libraries, class and learning management systems and other resources managed by Academic Computing & Media Services, and existing courses (e.g., CSE 3) to facilitate the teaching and learning of DIF.
 - f. Identify and develop scholarly activities that allow sharing, dissemination and discussion of DIF approaches and projects, such as summer mini-conferences and learn-at-lunch programs.

The aforementioned workgroup should include:

- o Vice Chairs for Education representing the five Academic Divisions (i.e., a subset of the Council on Undergraduate Education)
 - o Representatives from the Libraries
 - o Representatives/Directors of the Undergraduate College Core Sequences/Writing Programs
 - o Representative(s) from Academic Computing & Media Services (ACMS)
 - o Representative(s) from College Student Life offices
5. The Offices of the Associate VC for Undergraduate Education and the University Librarian should create a campus-wide professional learning community that would provide a mechanism and venue for ongoing dialogue and exchange around Digital Information Fluency among faculty, librarians, technical staff, Student Affairs staff, and students. DIF, as defined by the Advisory Group, is implicitly evolving and requires ongoing discussion to establish a continued and shared understanding of what DIF means for UC San Diego, to ensure that the DIF competencies and learning goals reflect contemporary requirements, and to advance cross-sectional collaborations in the design and delivery of DIF instruction.

VI. Executive Summary

The UC San Diego Senate-Administration Advisory Group for the [Information Literacy Theme for the WASC reaffirmation of accreditation review](#) examined the broader concept of Information Literacy within the instructional setting. The study's explicit foci were (1) development and management of e-stores; (2) students' skills in the process of critically evaluating, interpreting and using information; (3) students' awareness of being producers of knowledge and creators of digital information and data; and, (4) learning management systems for optimizing the use of such information in instructional settings.

Since one of the key characteristics of digital technology is the increasing ease with which each individual can become a media producer as well as consumer, the Advisory Group early in its deliberations agreed to reconfigure its focus from "Information Literacy" *per se* to "Digital Information Fluency" (DIF). Through targeted surveys, the Advisory Group established a baseline of current teaching and learning practices within the context of Digital Information Fluency.

Survey: Literacy/Digital Fluency Programs at other UCs and selected East Coast Universities

An all UC-campus survey (extended to also include several East Coast Universities) established that most of these programs do not focus on computer/technology fluencies but tend to emphasize information resources rather than the technology that supports them. None of the programs address digital/information fluency skills across the curriculum in a comprehensive or sequential manner. However, some of the universities' programs feature individual elements from which we can learn: high-level program management administered by the office of the undergraduate studies dean at the University of Central Florida, grant funding for supporting IF programs at UC Berkeley and Cornell, and the all-important faculty/IT/library partnerships forged at several of the campuses surveyed.

Survey: Current Teaching and Learning Practices at UC San Diego – Academic Senate and Non-Senate Faculty

The Academic Senate and Non-Senate Faculty surveys indicate that:

- a vast majority of instructors have course websites (although there are academic field-specific differences) and use them primarily to post pdf documents, PowerPoint slides created for the course, links to Internet resources, and video sites such as YouTube.
- Library e-stores are not being used extensively for instructional purposes
- most faculty do not use a Learning Management System ([WebCt](#))
- an overwhelming majority of the faculty do not teach the skills associated with:
 - the production of digital material
 - issues related to Internet resources' credibility and authenticity, fair use and copyright
 - issues related to students' own postings
 - the political and economic aspects of information
 - social network etiquette

Survey: Current Teaching and Learning Practices at UC San Diego - Librarians

A survey querying UC San Diego's librarians demonstrated that librarians teach students how to efficiently locate and effectively use material available on the Internet for course-related activities. Almost half of the librarians responded that they deliberately develop students' understanding that they are not only consumers of electronic information, but contributors and creators as well.

Survey: The Learning Management System at UC San Diego and other UCs

Learning Management Systems (LMS) survey established that all UCs are using forms of LMS with similar feature sets. All campuses except UC Riverside are using open source learning management systems or are moving in that direction. UC campuses are similar in that course websites and LMS use are chiefly supplements to resident courses. While this hasn't changed since LMS packages were first adopted, the complexity and range of tools used has expanded to include more media, especially (audio) podcasts and image-heavy PowerPoint. Other areas of recent growth include assignment collection, due to integration with Turnitin.com. Currently, LMS platforms are not being used for online course delivery except in very few cases, such as UC Irvine's summer school offerings. Nearly all UC Academic Senates appear opposed to the idea of online courses.

Feedback received through the surveys highlight that there is growing recognition that the ease of retrieval and reproduction permitted by digital technologies and the rapid growth in production and availability of digital information have led to transformative changes that require new ways of approaching and thinking about literacy in the digital environment. Attempts to locate existing definitions for DIF and consequently DIF learning goals were unsuccessful. Therefore, group members proposed to define DIF as an aggregate of three competencies, i.e., *Foundational Competency, Conceptual Competency, and Expressive and Rhetoric Competency*. They unfold as an intellectual and academic progression that occurs as a result of a student's full educational experience at UC San Diego.

UC San Diego already offers numerous courses in which one or more (of what the group defined as) DIF learning goals are being addressed. Among them, CSE 3 could potentially serve as a course that addresses most of the foundational learning goals identified in this report. Already existing partnerships between librarians and instructors exemplify ways in which through pedagogical changes alone courses could be reshaped to address some of the DIF learning goals.

The Advisory Group's key recommendations are:

- 1) Digital Information Fluency (DIF) should be viewed as an explicit component of undergraduate education at UC San Diego.
- 2) DIF should be integrated throughout the university's educational system, not sequestered within a single program, department, college, or unit.
- 3) DIF teaching should be accomplished through the campus' existing structures.
- 4) A working group is needed to incorporate DIF learning goals and outcomes throughout the UC San Diego curriculum.
- 5) A mechanism is needed to allow for ongoing dialogue around DIF.

VII. Acknowledgments

The Committee co-chairs would like to acknowledge the efforts of a number of individuals who contributed significantly to this report. First, we commend the efforts of the Advisory Group members. Many members took on extra assignments and conducted interviews of specific stakeholder groups or analyzed data or summarized the essence of our discussions and by doing so allowed us to see the trees for the forest.

We would also like to acknowledge the yeoman-like efforts of Bonnie Horstmann and Patricia Valiton, who served as our primary staff support. Additionally, we acknowledge and appreciate the great work of Sandy Beattie, who helped us make sense out of the voluminous survey data, converting it into meaningful presentations. We would also like to extend our gratitude to Patricia Valiton for her service as the chief editor for our report.

VIII. Appendices

A. Charge Letter

B. Survey Templates

- 1. Academic Senate Faculty Survey**
- 2. Winter Quarter Instructors (NSF) Survey**
- 3. Library Staff Survey**
- 4. Student Affairs Professionals Survey**
- 5. Technical Staff Support Survey**

C. Survey Data

- 1. Academic Senate Faculty:**
 - a. Charts and Graphs**
 - b. Analyses by Division/School**
- 2. Non-Academic Senate Faculty (NSF)**
 - a. Charts and Graphs**
 - b. Analyses by Division/School**
- 3. Library Staff**
- 4. Technical Support Staff**

D. Information/Digital Literacy Programs Matrix