

**INFORMATION FLUENCY AND INFORMATION TRAINING
FOR THE 21ST CENTURY**

A Proposal to the Andrew W. Mellon Foundation

From the

Associated Colleges of the South

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Information Fluency and Information Training for the 21st Century

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Information Fluency and Information Training for the 21st Century

An Executive Summary

The Associated Colleges of the South seeks \$600,000 over a three-year period in order to conduct specific activities to enhance information fluency and training on ACS campuses. Drawing on a group of extremely talented faculty, library directors and information technology specialists, the consortium plans to increase campus awareness of the information fluency issue in all its dimensions while offering specific programs in which students, faculty, library staff, information technology staff and others can learn to make effective use of information resources – to identify, interpret, understand, evaluate, apply and create information in any kind of format. These objectives will be met through two separate but overlapping and carefully coordinated approaches, one focussing on the teaching of research skills, and the second emphasizing training opportunities.

Information Fluency – Teaching Research Skills

The consortium seeks funds to enable it to examine the curriculum with an eye toward new programs and refinements that can enable individuals to access and assess information effectively. Efforts will also be made to examine the current information environment – institutional organization, planning and priorities and available technology – to establish specific learning outcomes and standards for information understanding and use, and to devise ways of effectively assessing how institutions and the consortium are enhancing information fluency. The programs will be carried out through intense collaborative projects on the campuses combined with workshop opportunities bringing together faculty, library staff, information technology staff and students. Current and former students will play the important roles of sounding board, advisor and mentor. Efforts made in the curricular area will emphasize individual disciplines and will be carried out in the context of individual student majors.

Information Fluency – Training Programs

The second initiative will involve extensive training programs linking faculty, library staff and information technology staff, with roles also foreseen for students and the faculty who play leadership roles in faculty development and curricular design at their institutions. These individuals will be brought together in order to enhance their ability to deal with the technology and work together in advancing information fluency among all groups on campus. As a result of the training effort, these individuals will be equipped to return to their campuses and conduct additional training programs. In a sense, we will be training the trainers for the institutions.

Training activities will take place at the ACS Technology Center at Southwestern University in Georgetown, Texas. Thanks to funding from the Andrew W. Mellon Foundation, this site is splendidly equipped to provide challenging instruction and training, both in terms of the facilities and the Center's leadership provided by Dr. Suzanne Bonefas, who has been directing the ACS technology programs for the last four years.

Conclusion

It should be noted that this initiative dovetails exceptionally well with the top priorities and strategic plans of the Associated Colleges of the South. The consortium has had the benefit of effective leadership in the technology and library areas, with technology faculty and library directors now working collaboratively to deal with the complicated area of information fluency. This grant would further cement that relationship and widen the circle to encompass information technology staff and students as well. Moreover, the program fits in with one of the overarching priorities of the consortium, namely, to create and offer programs that can ultimately enable students to enter graduate and professional school and the working world fully prepared to cope with the information revolution.

Information Fluency and Information Training for the 21st Century

I. Introduction

In response to the kind invitation from the Foundation, the Associated Colleges of the South is pleased to submit this grant proposal for a total of \$600,000 over a three-year period. The proposal seeks funding for an important and imaginative consortial initiative, namely, information fluency and training for the 21st Century. The first thrust – information fluency – responds to area two of the proposal invitation, which covers faculty, library and information technology staff collaboration in teaching research skills to students. The second initiative – information training – responds to area three of the invitation, encompassing summer institutes in which faculty, library and information technology staff will collaborate on pedagogical and curricular efforts. Naturally, there is some overlap between the two efforts.

The information fluency plans focus on the curriculum and the development of learning outcomes, with attention paid to the student major and consequently courses beyond the freshman year. They depend in large measure on bringing together three key groups on the campus: faculty, library and information technology staff. Moreover, close ties will be necessary with faculty who are playing leadership roles in faculty development and curricular design. There is a significant role for students in this endeavor as well, both current students – learning to serve as information mentors to fellow students – and recent students being asked to assist with design and teaching responsibilities.

Analyzing the information architecture or infrastructure on the campuses is also a vital component of this effort – identifying current information fluency related initiatives on each campus along with opportunities for improvement and potential collaborations.

The ACS believes that moving ahead in information fluency also requires a new process of assessment – that is, evaluation of consortial and institutional progress in fulfilling the learning outcomes identified and desired for students. This is a formidable challenge, but without such assessment, the ACS would not be able to determine the extent to which it has met its objectives in advancing information fluency. With an effective assessment process, the consortium can provide accountability while stimulating the most vigorous efforts to fulfill the ambitious objectives set before the institutions.

Meanwhile, the ACS seeks funding for training – training with significant implications for curricular reform and design, and offered at its Mellon-sponsored technology center. Foreseen are summer institutes and also workshops during the academic year – all linking faculty, library and IT staff in close collaboration. Members of each group will be viewed as information teachers; in a sense, they will play the role of team teachers, thereby focussing on what they can do collaboratively to foster and enhance student learning. Consequently, pedagogical training will be essential.

At the same time, the training will encompass a joint effort to design and re-design the curriculum as related to information fluency – accomplished in conjunction with the closely related area of pedagogy.

The group is also very interested in availing themselves of the opportunity at the Frye Institute at Emory, seeing the advantage of participating in what is expected to be a high quality service to library and IT staff. The case for ACS participation is bolstered by other collaborative arrangements ACS has with Emory.

Finally, it should be noted that the initiative we propose fits in exceptionally well with ACS and its institutional long term plans for information fluency and training. Library and faculty information literacy committees have been at work on preparing such plans and are now working together in that effort. This grant opportunity dovetails perfectly with their efforts and will provide a further stimulus as the consortium attempts to develop new models for information literacy and fluency.

II. Information fluency – Teaching technological research skills

An ever-increasing amount of information has made the finding, analysis and presentation of useful, relevant and reliable data a critical skill for a lifelong learner. While not a new problem, technology has magnified the issue by enabling the quick production and dissemination of massive amounts of information, as well as allowing its easy and transparent modification.

It is critical that a liberally educated person be able to deal with this information overload throughout his or her life. A person with a liberal arts education should be informed, knowledgeable, and self-sufficient, able to collect and evaluate the information needed to make decisions, and able to present those decisions in a clear and convincing way.

Today's technology provides an effective means to gather, analyze and present information, making it an essential part of a liberal arts curriculum.

It is not enough, however, that a person knows how to use the available tools. Just as important is an understanding of how such tools may be used to accidentally affect or intentionally manipulate perceptions and decisions. It is therefore important that students understand the ethical implications associated with the use of information. By including in a liberal arts curriculum the skills and principles necessary to work with the large amounts of available information, as well as an understanding and appreciation of the uses of these tools, students will be prepared to be lifelong learners in today's world. They will move from simply being information literate to being information fluent.

Information fluency is not a destination but an evolving process in which the learner continues to grow in the understanding and use of information. It is a complex compendium of knowledge and nuance, heavily influenced by experience and technology. If information literacy can be compared to the ability to read a menu in a foreign language, information fluency would be the ability to carry on an intelligent conversation in that language. It is the capacity which ultimately lies at the intersection of technology, information literacy and critical thinking abilities.

In confronting this multi-dimensional issue, ACS proposes that four components be addressed:

- A. The curriculum
- B. Information architecture
- C. Information standards and learning outcomes
- A. D. Information assessment

A. The Curriculum

We believe that "one size fits all" approaches to information literacy are inconsistent with the mission of the liberal arts college. Furthermore, we recognize that there are tools and technical skills that are unique to every academic discipline. In order for us to become truly fluent in the use of information and technology, these skills must be learned in a meaningful context, and in such a way as to ensure that students not only put them into practice, but also have the opportunity to continually refine these skills in every course within a discipline. Therefore, rather than developing a single set of courses and skill sets for all students, we plan to integrate information fluency into the curriculum by examining the role of information and technology within the context of specific majors.

This process will involve identifying faculty members and courses which can serve as models for all ACS institutions, and asking these faculty to work together with librarians and information technology staff to refine old courses as well as develop new courses and modules that can be implemented across the consortium. Several ACS disciplinary groups already have a history of working together (for example, biologists, chemists, economists, language faculty and classicists), so we might begin with some of these disciplines. It will be important that this process is not limited to one or two courses. We will therefore ask that each course within a major be re-thought with an eye to integrating fully and consistently information technologies and skills. We have already identified several courses that can serve as such models.

Several ACS institutions are already embracing this approach to information fluency. For example, library and IT staff at Rollins College have begun discussions aimed at providing intensive instruction for majors in various disciplines and they are already doing so in several academic departments, including English, Psychology and History. At Washington and Lee University, information resource courses are also being developed within disciplines, emphasizing the development of critical thinking and learning and the practical skills necessary to use technology effectively in acquiring, analyzing and disseminating information. (See appendix for W&L's proposed course description for French 190)

In addition to such disciplinary models, we are also interested in infusing technology into inter-disciplinary collaborations. Indeed, ACS is currently offering two inter-disciplinary courses that depend upon technology for delivery: “The American Experience in Vietnam”(currently being offered at Centenary, Rollins and Richmond) and “The Archaeology of Western Anatolia” (offered at 6 ACS institutions in 1999 and at these and also DePauw University in 2000). The archaeology course not only depends on the Internet for delivery, but also includes technical skills as a major part of the course content – students use the internet as a research and publication tool, study computer-aided design, graphics manipulation, GIS, database design and data entry and other technical applications. We believe that there are opportunities for similar inter-disciplinary projects that require both basic and sophisticated technical skills from students and faculty.

Faculty participation in such technology-enriched courses requires high-level skills, on the part of both the faculty who teach the courses and the information specialists who provide technical and research support. We believe that input from faculty, library staff and information technology staff is crucial for the success of these endeavors, and that members of all three of these groups should be involved in course design and implementation from the outset. Therefore, the workshops described later will involve representatives of all three groups.

The meaningful infusion of technology into the curriculum involves not only treating technical skills as course content, but also using technology as a delivery mechanism. Such mechanisms must be carefully evaluated and selected on sound pedagogical bases, so that they will enhance the educational experience rather than distract from it. In addition to selecting the best technical solutions for delivery, it is also important that faculty be trained in the new pedagogical techniques that are required by the new technologies. We again envision this training as a joint effort among faculty and IT and library staff. Such joint training ensures that faculty will be aware of all the subtle capabilities of the technology and that support staff will be cognizant of classroom-specific issues in each discipline and course.

In addition to our focus on examining current courses and designing new ones, we would also like to explore the possibility of some type of information fluency certification for students who complete the courses. While we will study all current efforts of this type to see what they have to offer, we do not envision such certification as being so much a test of skills as a demonstration that students understand the role of technology, and can put this understanding into practice in the context of a given discipline or major.

We see an important role to be played in both the design and implementation of technology-enriched courses for students. As is often said, today’s students in many ways outstrip their teachers in their technical knowledge and expertise. In addition to playing a support role, we see opportunities for upper-class students to serve as "technology mentors" to their younger peers, perhaps leading study sessions that would supplement the regular instruction.

For inter-institutional courses, we have learned that some kind of face-to-face interaction is critical to student success in the course. Student mentors (who perhaps have participated in one of these inter-institutional courses in the past) could thus play an important advisory role in courses where the primary instructor is located on another campus. We envision a similar role for graduates of ACS institutions. In this case, alumni have the advantage of already being in an environment where they use their information skills every day, and could thus serve as a significant resource for those designing and teaching the new technology-enriched courses. Like the upper-class students, they could also play an important role as mentors to students enrolled in the courses.

B.

C. B. Information Architecture

As we examine how to infuse technology into the teaching of research skills to our students, we intend to conduct an in-depth study of existing consortium resources – both human resources and technical infrastructures.

In other words, we will focus on information architecture, which delineates the framework of the information fluency nexus – human resources, hardware, software, information sources (including the library itself), and the interrelationships among these features. This will encompass a broad range of functions and responsibilities, including information creation, retrieval, validation, storage, systems maintenance, safeguards, security, and procurement, and communications and reporting within the network.

The group will look carefully at the organization and staffing in library and IT departments, in the light of skills that we want to cultivate in our students and teach in our courses. Given the relatively small staffs of our institutions, it is often the case that certain specialties may be represented at only a few of our institutions. For example, many ACS faculty and students in numerous disciplines are interested in learning more about geographic information systems (GIS) and how to apply GIS in their disciplines, but there are relatively few experts to call upon (e.g., Science Librarian Hugh Blackmer of Washington and Lee). After we have completed this inventory, we will be able to pinpoint specific skills where training is necessary, both at the level of the consortium and at individual institutions.

We will also include in this survey an analysis of available hardware and software that might support consortial programs and digital repositories, such as database servers and synchronous and asynchronous course delivery systems. Because ACS schools have differing network capacities and server and client operating systems, it is important that we take into account existing infrastructures in planning any consortial initiatives, in order not to render consortial resources inaccessible to either our own institutions or the general population. We will work with staff at all ACS institutions to identify appropriate and affordable (and, where possible, non-proprietary) standards to ensure long-term and uninterrupted access. We plan to actively pursue collaborations with other organizations,

perhaps at a national level, and must therefore ensure optimum compatibility at the level of the technological infrastructure.

At the same time, we will survey each ACS institution's priorities and long-term plans, both technological and curricular, to ensure that consortial efforts support these plans. Some of our institutions already have fledgling information literacy programs of their own, and have been thinking about these issues for some time. Wherever possible, we want to build upon existing planning and expertise, and serve as a vehicle for disseminating these ideas to the rest of the consortium.

An important part of our resources and needs analyses will be an examination of current budgets (and budget constraints), costs and institutional spending priorities. Our goal will be to identify means whereby we could contain or reduce such costs by working as a consortium. For example, we want to continue our efforts to find opportunities for joint purchasing of hardware and joint licensing of software. We will also consider areas in which it would make sense to streamline redundant operations, especially in areas where several institutions are engaged in similar pursuits where it might make sense (in terms of both labor and equipment costs) to combine these operations. An example might be specialized server applications such as GIS or similar programs that require a great deal of expertise to manage, although only a few faculty may be using them. By coordinating such efforts, we can realize both cost efficiencies and provide more faculty with an opportunity to avail themselves of such resources.

Having conducted a detailed survey of our technical strengths and weaknesses, and having begun to address the latter via training at the ACS Technology Center, we hope to identify potential partners for ongoing research projects, such as building digital repositories and creating on-line publications. We feel that such projects, with a strong grounding in both academic research and technological skills, will provide an excellent opportunity for our students to gain contextualized technical experience as well as provide insight into the process of creating quality information resources. Such programs will, at the same time, provide collaborative research opportunities for faculty, particularly those who may have small (or nonexistent) academic departments at their home institutions. We have already found this to be true in the ACS archaeology program, where students and faculty from 6 ACS institutions, in such diverse disciplines as classics, biology and geology, work with an international research team to carry out and publish important archaeological research. Library and IT staff will serve as crucial members of these research teams, providing the necessary expertise for bringing these projects to fruition.

In the context of such collaborative research programs that utilize information technology to the fullest, and that involve students, library staff, information technology staff and faculty, we would like to identify some best practices for the creators of digital information. We feel that this is an often-overlooked facet of information literacy efforts. Although it is part of our mission to teach students to discern when confronting the information available on the Internet as well as in print sources, we do not always adhere to such high standards ourselves. In most instances, this is a question of availability and

quality of training – many faculty simply do not have the time and the resources to learn the subtleties of information architecture that underlie the ability to create high-quality web sites and digital resources.

Even faculty who have received some basic training in HTML will probably lack the kind of training library staff have in principles of information organization and management, or recognize that such standards even exist. It is also difficult for faculty to keep up with new advances in technology, or understand the subtleties of emerging standards that affect the longevity and continued usefulness of data they produce, although IT professionals keep up with these advances on a regular basis. In order to ensure that our digital publication efforts endure and are not dependent on ephemeral technologies, and also that they are presented in such a way that is optimal for current and future research, we will carefully study standards for data markup, access and maintenance. Thus, we hope that these three groups can work together to identify and implement standards for information creators, and to integrate these standards into the courses and allied research projects that we create.

C. Information Standards and Learning Outcomes

In undertaking a project that impinges on so many interests, areas, and participants in academic life, it is imperative that well-defined standards and learning outcomes guide these endeavors. Standards are needed to define the subject and tasks involved, to focus and direct efforts, to organize and evaluate training, to establish quality control and to evaluate the results.

Standards provide a framework for assessing the abilities of the information fluent student and the comprehensiveness of the instruction imparted by the faculty, librarians and information technology staff. While there is general agreement on the importance of information literacy, there is less agreement on what constitutes fluency and how one can judge the success of a program aimed at achieving fluency.

Development of standards will enable the consortium to define the subject and focus efforts, as well as organize and evaluate training. Finally, standards will be needed to establish quality control and to assess results.

Preliminary attempts within ACS membership to articulate basic standards of information fluency began this past summer, resulting in these four general principles (an elaboration of the principles is provided in the Appendix):

Principle 1. The information fluent person will be able to identify the scope and types of information needed to address a given problem or issue and collect information relevant for his or her response to the problem/issue.

Principle 2. The information fluent person will be able to assemble and effectively analyze the appropriate body of information in order to solve a problem or resolve a question.

Principle 3. The information fluent person will be able to organize the articulation of the problem or issue addressed, relevant background information, and the problem analysis and conclusions derived from this information into a coherent argument appropriate for the intended audience.

Principle 4. The information fluent person will be a critical and intelligent information consumer.

Organizations outside of ACS like the Association of College and Research Libraries (ACRL) have developed comprehensive standards, and it will be necessary for the various groups within ACS to examine these standards, link them to current ACS efforts and develop standards that will work within the ACS framework and contribute to the national and international discussion.

While these principles are the first step toward reaching consensus on information fluency standards, development of specific measures of learning outcomes is the necessary next step if the standards are to be credible and effective. ACRL has developed measurable outcomes for each of its standards and these will be a good model for ACS efforts. Other models will also be examined and the consortium members will use them to develop a set of measurable outcomes reflecting the standards and resources available through the consortium.

D. Information Assessment

The consortium is committed to an intensive assessment effort, concentrating on this proposed initiative and its impact on information fluency. The effort will encompass individual parts of the initiative as well as the initiative as a whole. Why an assessment undertaking? There are many answers, starting with the need to determine whether or not the program is successfully fulfilling its goals – and if it is not succeeding, where it is falling short. Assessment can play an important role in validating the work being performed, certifying progress and stimulating further progress. At the same time, by pinpointing weaknesses, it can pave the way to improvements that need to be made. Assessment is a way of holding people accountable, and providing a stimulus for effective performance. The consortium feels that mounting an assessment effort will help to put a spotlight on the overall program, raising the consciousness of the campuses to information fluency as a central issue on campus. As assessment reports are completed, they can also serve as a very significant mechanism for communicating the nature of the overall effort and its goals to various audiences, including those beyond the consortium.

The ACS hopes to develop a structure and process for evaluating information fluency initiatives that will be worthy of emulation by other institutions – an evaluation model that can be replicated throughout the country.

With this rationale in mind, ACS plans an assessment effort, drawing on expertise within and outside of the consortium. It will draw upon individuals or persons with expertise in information fluency and evaluation programs. Key steps in assessment will not wait for the third year of the project; rather, they will begin at the outset of the project.

Evaluators will visit and revisit projects and project directors, offering the kind of on-going feedback that can reinforce current efforts and provide lessons for mid-course correction, if such action is appropriate.

While assessment results will be used in the program as it develops, these results will also be disseminated to other interested institutions and consortia and will be made available to the Foundation as the funding agency. In this way, outside organizations can keep abreast of activities within ACS and be encouraged to provide helpful advice along the way.

Special workshop and planning sessions will be held to create the appropriate assessment instruments and produce a timetable for the various steps involved in the process. Those immersed in this effort and others will be invited to take part in the training workshops as well, through which they will learn important lessons about the conduct of assessment efforts and how they can train additional assessors and evaluators from their campuses.

III. Information Fluency: Training Program

Introduction

Training is an important part of our effort to ensure that our graduates are equipped to handle information and technology – that is, training of members of library and IT staffs as well as faculty. Moreover, while some of the training we envision will be more appropriate for specific groups, we consider it essential that these groups work together in all aspects of this initiative, as all play crucial roles.

Role of Library Staff

Library staff traditionally oversee information organization and management, and are also instrumental in training both students and faculty in effective research methods. With more and more research indices and publications moving into electronic format (many of which have unique organizational systems), we rely heavily on the expertise of library staff in order to conduct effective research. At most ACS institutions, librarians already provide students with regular bibliographic instruction, often as part of the core curriculum for freshmen. We would like to take this a step further, so that library staff are also involved in courses that count towards the major, and that focus on discipline-specific research.

Role of IT Staff

Information technology staff play the critical roles of both system and user support. Moreover, they have expertise in areas that once were the exclusive domain of information specialists, but are increasingly becoming necessary skills for information users – for example, creation of web pages and interactive internet resources, and database design and implementation. As system and network administrators, they are also responsible for ensuring uninterrupted access to Internet resources. Thus, it is important that they be involved in any effort that involves either skills training or the creation and long-term maintenance of digital repositories.

Role of Faculty

Faculty, who both design and deliver courses, are the most direct link to students. They also have discipline-specific research expertise, though, with the emergence of newer electronic resources, it is more and more difficult for them to remain current. They do the majority of the teaching, but are not necessarily the group with the most expertise in the new technologies. Training this group is therefore crucial, especially training that results in ongoing relationships and collaboration with library and IT staff members.

Workshops

We plan to offer workshops and planning meetings for members of these three groups in the same areas as were discussed above: curriculum and course design, information architecture, standards, and assessment.

Curriculum

These workshops will serve both as venues for the discussion of pedagogical issues related to the infusion of technology into the curriculum and as planning meetings for the re-design of current courses and the design of new ones with an IT component. We believe that we have already made great progress in educating our faculty about the possibilities enabled by technology, and we would like to build upon this foundation by critically examining these technologies and the information retrieved through these technologies in order to determine which are the most pedagogically sound. We hope that the result will be new and enhanced courses that go beyond the use of technology as an "add-on," and that fully integrate technology into both course content and teaching methodologies. Participants in the course design meetings will work closely with members of the standards and assessment groups, in order to design a curriculum that explicitly addresses these standards of student proficiency in information fluency.

Information Architecture

After an initial meeting in spring 2000 to identify the areas in which additional training is required, based on the inventories described above, we will design workshops that best meet the needs of ACS faculty and library and IT staff. We already know that members of these groups are interested in techniques and emerging standards for digital publication, so that workshops might be offered on such topics as XML (extensible markup language) and database design and use. We are also concerned about legal and ethical issues associated with making materials available on-line, such as copyright and fair use.

Standards

In this area, ACS already has a core group who have met in the summers of 1998 and 1999 to begin developing both standards for information fluency and measurable outcomes based on these standards. We expect that members of this group will play in an important role in course design, as well as continue to refine these standards and outcomes. (See Appendix for a draft of their report.)

Assessment

Participants in our assessment workshops will study how to most effectively measure a student's proficiency, working from the guidelines and outcomes under development by the standards group. It will be the task of the assessment group to develop a process to measure outcomes, administer assessments across institutions, and determine how to make use of and disseminate the results of their assessments. This is a critical step to our endeavor, since we hope that by sharing these results widely, we can initiate a dialogue about information fluency that goes beyond our consortium, to the national level.

Workshop Site

The Mellon-sponsored ACS Technology Center at Southwestern University in Georgetown, Texas presents an ideal setting for much of this training. Indeed, ACS is sponsoring a relevant symposium there in November for faculty, librarians, information technology staff and faculty development leaders. Entitled "Toward Information Fluency in the Liberal Arts," the two-day symposium will focus on central issues related to information fluency, share information on approaches and standards, and identify ways of collaborating more effectively in promoting information fluency. (See the Appendix for the agenda for this meeting.) The results of the symposium will be posted on the ACS website, made available for conference presentations and submitted for journal publications.

Workshop Timeline

Note: It is our expectation that ACS staff and others will attend multiple workshops, in order to ensure that all participants remain apprised of all facets of our Information Fluency initiative. In addition to these meetings, participants and all interested ACS

faculty and staff will be invited to participate in ongoing listserv and bulletin board discussions. We will also publish regular reports and updates on our website and in our monthly e-mail newsletter.

Spring, 2000: Initial Planning meeting with library, IT and faculty representatives from all ACS institutions to determine agendas for summer 2000 workshops (e.g., what skills to focus on, how to select courses for (re)design)

Summer, 2000: Workshops/Planning meetings: Standards & Assessment; Curriculum design; Technical issues

Summer, 2001: Follow-up workshops to those of Summer, 2001

Summer, 2002: Workshops and final meeting of Assessment group; joint meeting of all 3 groups to discuss future directions

IV. Outcomes

I. Information Fluency

A myriad of positive outcomes are expected from this new ACS initiative – some quantitative, some qualitative, and some a combination of the two. Focussing first on the information fluency component of the proposal, the program planners anticipate that during the project's first 18 months ten academic departments on each campus will be active participants, looking at ways in which information fluency can be adapted to current courses or how they can be modified or new courses created. More departments are expected to join following the success of the initial group. Assuming involvement by four faculty members per department per institution (some larger departments will no doubt pique the interest of many more), we estimate 40 faculty members will be actively immersed in the effort, working alongside two or three library staff and one to two instructional technology staff per campus. In aggregate, 45 individuals per campus or 675 faculty and staff across the consortium will be affected. To further illustrate the impact, this means that nearly one-third of total ACS faculty and virtually all major library staff and instructional technology personnel will be involved. Student participation is also a major program benefit. During the first 18 months, the planning committee's goal is to recruit 20 current students and ten alumni per institution to be engaged in the project, totaling 450 students. Again, as with faculty and staff, more students are expected to participate after the initial 18 month period.

Many of the above individuals will be especially active on their respective campuses, meeting with specific departmental and institutional curriculum committees, attending special conferences and workshops concentrating on the curriculum, working on related areas of pedagogy, curricular design standards, and assessment.

Qualitatively, when put into practice this extensive participation will yield fuller, richer, more attractive courses and special modules, which, in turn, are expected to

increase student satisfaction and improve performance related to information fluency. The emphasis on pedagogy likewise should have a notable impact on faculty that filters down to students through improved course design and teaching methods. Finally, establishing specific standards for information fluency will stimulate student performance. The extent to which they meet or exceed those standards will demonstrate how successful the project has (or has not) been.

II. Information Fluency Training

The consortium anticipates lively interest among its target audience for information fluency training. Two principal workshops are scheduled per year, each attracting roughly 30 faculty members, thereby benefiting 180 people over the entire grant period. At least one follow-up workshop per year is planned at each institution. Assuming 25 participants for each, an additional 375 faculty members will attend these follow-up sessions. If an equal number of new participants enrolls each year for these on-campus workshops, over 1100 faculty members will be trained over the three-year period. However, since some duplication in attendance is likely, a more reasonable estimate presumes approximately 900 different attendees. Adding in library staff attendance (30 participants for each of the two principal workshops) increases the total by 60 each year. IT staff would also be represented, but given their small staffs on each campus, we expect only fifteen participants from this group per year, and a three-year total that is not much higher. The number of current and former students who receive training will be roughly the same number (20 current students and 10 alumni per campus) and the same individuals recruited in the information fluency component described in part I. But, special efforts will be made to persuade as many students as possible to participate in the training workshops.

The planning group is confident that the qualitative impact of the workshops will be far-reaching and will lead to better use of information technology and thereby to improved student performance and satisfaction. ACS will document the results using anecdotal evidence, test results, and other assessment tools (developed under the auspices of this grant) to determine and report how well students are progressing in accessing, understanding and making use of information.

V. Dissemination and Collaboration with other Organizations

The focus of this proposal is on promoting collaboration within the Associated Colleges of the South; at the same time, the ACS is mindful of the advantages of sharing its information widely with other institutions and consortia interested in the same subject. It plans to circulate information that will be useful to others, while learning how other groups are confronting the same issues. Consequently, it plans to maintain close relationships with the other organizations that have been invited by the Mellon Foundation to apply for grant funding in the area of information fluency.

The ACS plans to begin this sharing effort early during the grant period, knowing that it can use the wise counsel of the other groups as it develops course materials, plans training activities and carries out other projects. Liaison representatives from ACS to the other groups will be appointed so that the information exchange and consultation can

continue throughout the project, and pave the way for a broad, collaborative dissemination of results at the end of the grant period. ACS hopes that it can join the other organizations in broadly disseminating information results related to information fluency and explore the possibilities of working together in the future to spread the lessons and benefits of this experience on a broader and national scale.

We do envision a concerted, multi-consortial initiative in the future, and will explore and test the possibilities of such an arrangement as the three-year grant period unfolds.

VI. Proposed Budget

	<u>Year One</u>	<u>Year Two</u>	<u>Year Three</u>	<u>Total</u>
Information Fluency – Teaching Research Skills				
Release Time/Stipends	40,000	40,000	40,000	120,000
Workshops/Meetings	50,000	50,000	50,000	150,000
Consultants	3,000	3,000	3,000	9,000
Travel	7,500	7,500	7,500	22,500
Information Fluency - Training Programs				
Training Workshops	50,000	50,000	50,000	150,000
Consultants	2,000	2,000	2,000	6,000
Travel	7,500	7,500	7,500	22,500
Office				
Supplies and Equipment	12,500	12,500	12,500	37,500
Staff Assistance	27,500	27,500	27,500	82,500
Total	200,000	200,000	200,000	600,000

Budget Narrative

I. Information Literacy - Teaching Research Skills

Release Time/Stipends

Release time/stipends will be made available to faculty, staff and students to work on specific projects related to curriculum review, the development of standards, information architecture and assessment of performance. For example, a group of faculty members might work on the development of a specific course to be implemented on one campus and made available to others. (\$2,500 for each of sixteen individuals, or \$40,000 per year)

Workshops/Meetings

Workshops and conferences will be organized around the specific projects areas mentioned above. For example, faculty involved in curriculum design will come together to share their work and insights, leading toward model courses. Those involved in developing standards or learning outcomes will collaborate in reviewing alternative standards and agreeing on appropriate measurable outcomes. (Based on the experience of ACS in conducting such workshops and meetings over the last five years, \$25,000 is the expense for a single workshop for 15-20 participants, or \$12,500 for two workshops involving 7-10 participants)

Consultants

The consortium needs to take advantage of outside consultants who have worked in literacy across the curriculum programs, developed performance standards, worked with information architecture issues and who have conducted program and institutional assessments (six consultants at \$500 apiece)

Travel

Travel funds will be necessary for staff and project leaders to look at specific programs and conduct planning and evaluation activities (\$750 x 10 trips)

II. Information Fluency – Training Programs

Training Workshops

The ACS plans to hold two workshops per year for training purposes, each designed to bring together faculty, library staff (at various levels) and institutional technology staff to enhance their understanding of the information process and enable them to work together more effectively (at \$25,000 for each of two such workshops). Students would also participate in these workshops.

Consultants

Consultants will be very useful in planning, organizing and leading the training workshops (four consultants at \$500 apiece)

Travel

Staff travel and planning sessions for the workshops will be necessary (Ten trips at \$750 each)

III. Office

Supplies and Equipment

Supplies, equipment, materials, software and related office expenses will be necessary (at \$12,500)

Staff Assistance

At least half-time professional staff will be necessary to supply leadership and coordination for the overall effort (\$25,000 in compensation for such a position plus \$2,500 for secretarial assistance)

VII. Conclusion – Synergies with ACS Priorities and Planning

This proposal is extraordinarily well-timed for the ACS, coming at the end of a special four-year library initiative funded by the Mellon Foundation and at the beginning of a new three-year technology effort that creates a technology center for ACS institutions – a center funded by the Foundation. In many ways, this information fluency initiative is a logical outgrowth of the ACS “virtual library” effort through which the institutions dramatically expanded their access to electronic materials and conducted research on the use of those materials as well. Moreover, the information fluency plan advanced in this proposal calls for extensive training, thereby connecting itself quite naturally to the new ACS technology center, which has been established for the kind of training the consortium now proposes.

It should also be noted that the new proposal coincides with an urgent and top priority topic for the consortium and its emerging plans for the future. At recent meetings of the presidents and the chief academic officers, the topic of information literacy and fluency was identified as an emerging priority concern for the consortium as a whole. When asked by the chair of the board to identify a single issue or topic on which the consortium should concentrate its attention, the ACS president indicated that it was information fluency.

This grant will thus build on current interests and priorities in the consortium, and enable the consortium to move rapidly toward fulfilling its ambitious goals.

As a consequence, the leaders of the ACS greatly appreciate this opportunity and hope that this proposal merits the support of the Foundation.

APPENDIX I: WORKING GROUP REPORT

Toward Information Fluency in the Liberal Arts Preliminary Report ACS Working Group on Information Literacy July 17, 1999

1. Introduction

An ever-increasing amount of “information” has made the finding, analyzing and presenting of useful, relevant and reliable data a critical skill for a lifelong learner. While not a new problem---people have struggled with information in various forms for centuries---technology has magnified the issue by allowing the quick production and dissemination of massive amounts of information, as well as allowing its easy and transparent modification. In addition, people today cannot help but passively receive information of all sorts through television, motion pictures, radio, and print media. Bombarded with information from all sides, a one can easily find oneself overwhelmed and in a state of “information anxiety.”

It is critical that a liberal arts educated person be able to deal with this “information overload” throughout his or her life. A person with a liberal arts education should be informed, knowledgeable and self-sufficient, able to collect and evaluate the information needed to make decisions, and able to present those decisions in a clear and convincing way. Today’s technology provides a means to effectively gather, analyze and present information, making it an essential part of a liberal arts curriculum.

However, it is not enough that a person know how to use the available tools to gather, analyze and present information. Just as important is an understanding of how such tools may be used to accidentally affect or intentionally manipulate perceptions and decisions. It is therefore important that students understand the ethical implications associated with the use of information. By including in a liberal arts curriculum the skills and principles necessary to work with the large amounts of available information, as well as an understanding and appreciation of the uses of these tools, those educated will be prepared to be lifelong learners in today’s world. They will move from simply being information literate to being information fluent.

2. Background

A survey of the dialogue on information literacy demonstrates an evolution of definitions, standards, and goals toward this end. Less than two decades ago, definitions involved finding relevant information and some vague notion of using that information effectively. More current descriptions have expanded to include personal development (critical

thinking, life-long learning, etc.) and problem solving. Only the most recent attempts, however, involve some idea of fluency.

For example, this 1989 description of an information literate person has some vague notion of finding and effectively using information:

one able to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." The American Library Association. Presidential Committee on Information Literacy. Final Report.
<gopher://ala1.ala.org:70/00/alagophiv/50417007.document>

A 1993 definition of information literacy expands the idea but is also vague:

"the skills of information problem solving." Wisconsin Educational Media Association (adopted by the National Forum for Information Literacy). Position Statement on Information Literacy.
<http://www.ala.org/aasl/positions/PS_infolit.html>

The following definitions, written in 1996 and 1997, respectively, show further expansion of the concept of information literacy, adding the ideas of personal development and delivery of the information.

"the ability to locate, evaluate, and use information to become independent life-long learners." Commission on Colleges, Southern Association of Colleges and Schools (SACS). Criteria for Accreditation. 10th ed.
<<http://www.csupomona.edu/~library/InfoComp/definition.html>>

"the abilities to recognize when information is needed and to locate, evaluate, effectively use, and communicate information in its various formats." State University of New York (SUNY) Council of Library Directors. Information Literacy Initiative.
<<http://olis.sysadm.suny.edu/ili/final.htm>>

More recently, the Association of Colleges and Research Libraries has been drafting Information Literacy Competency Standards, found at <<http://www.ala.org/acrl/ilintro.html>>. "The Big6.com" has published a model of Information Problem-Solving at <<http://www.big6.com/overview/index.html>>.

Perhaps the most authoritative commentary on information literacy is the recent publication "Being Fluent with Information Technology."

"fluency with information technology (i.e., what this report calls FITness) entails a process of lifelong learning in which individuals continually apply what they know to adapt to change and acquire

more knowledge to be more effective at applying information technology to their work and personal lives.”
<<http://books.nap.edu/html/beingfluent/es.html>>.

3. From Information Literacy to Information Fluency

In the ever increasing complexity of today’s world, the liberal arts graduate must be prepared to deal with a variety of issues and opportunities, most of which are influenced by the need to acquire and assess information. The ability to succeed in this environment will be influenced by the quality of the learning experience as an undergraduate. Thus, as we look to the future we must understand the critical nature of providing the appropriate framework for the student to internalize the ability to work creatively in an information-driven society. Information fluency should be one of the outcomes of the liberal arts experience.

The road to information fluency is paved throughout the undergraduate experience and the destination is never reached. In fact, the undergraduate experience only sets the stage for a lifelong journey of learning and grappling with an ever-expanding body of knowledge and resources to be accessed and used. But, the first step to paving this road is the understanding that faculty commitment to the concept of information fluency is essential. It is only through making information issues a factor throughout the curriculum that information fluency will be an outcome for students. Helping faculty with their own information fluency is a determining influence in their ability to deal with the issues in their own courses. The extensive faculty development work in teaching with technology that has been accomplished by ACS is clearly a major foundational element in this process.

Information fluency is not a destination but an evolving process in which the learner continues to grow in the understanding and use of information. It is a complex compendium of knowledge and nuance, heavily influenced by experience and technology. The first step in the process is information literacy, which can be compared to the ability to read a menu in a foreign language. To continue with this analogy, information fluency can be compared to being able to carry on an intelligent conversation in that language. It is the capacity which ultimately lies at the intersection of technology, information literacy, and critical thinking abilities.

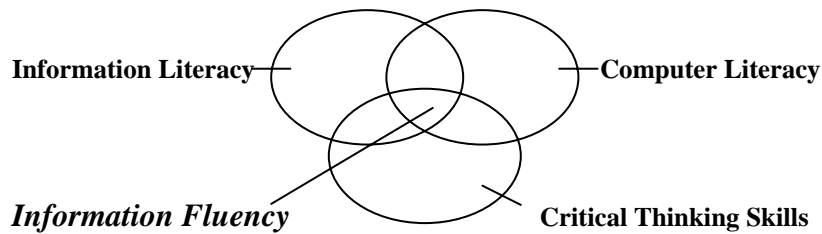
In today’s environment, it is impossible to divorce information from technology. Thus, we must deal with how technology influences work with information. With each passing year, students come to college with a greater knowledge of computing tools. Thus, their technology skills are improving. Yet, their information literacy is at an early stage of development.

At the earliest stage, students must be made aware of what information literacy is and how their technology skills can be used to strengthen their literacy. Awareness is a fundamental element in questioning the validity of something. For example, knowing that tire pressure is integral to automobile safety makes one question whether or not his

or her tires are properly inflated. Thus, a key step on the path to information fluency is awareness of issues.

A major task in the educational process is to make students aware of issues. For example, having some experience in manipulating graphic images makes one understand that a “photograph” in a magazine may not be exactly what it appears to be at face value. A more complicated example is that the floating point number system typically used in most computer calculations can create catastrophic results in certain circumstances. Understanding that this can be a problem frees one from thinking that an “answer” obtained from a computer must be correct.

Decisions are made based on the availability of information. The quality of the decision is clearly related both to the quality of the information and to the proper application of its use. We believe that information fluency involves abilities to think critically about an information problem or issue, collect the information necessary to inform this critical thought process, and combine information and critical thinking skills to analyze the information available, synthesize conclusions about the problem at hand, and present the results of this analysis and synthesis in an effective way. Of course, a facility with and an understanding of the capabilities of computing technology are central to this entire process in today’s world. However, as the diagram below illustrates, it is only when these computing skills are combined with a knowledge of information, including its many forms and sources, and critical thinking skills that information fluency is achieved.



4. Some Thoughts on Information Fluency Standards

We believe that basic standards of information fluency can be defined at a high level to be domain independent. However, the effective implementation of these standards will require instantiation within specific knowledge domains. For example, the specific performance indicators demonstrating how the standards might be applied in biology or chemistry may be quite different from those for the humanities – and these in turn will likely be different from those applicable to the arts and so on. In short, we believe that information fluency must be *implemented* in specific knowledge domain contexts. Nonetheless, we assert that basic principles of information fluency can be identified, articulated, and measured. We have attempted to identify some of the most important of these principles here.

Principle 1. The information fluent person will be able to identify the scope and types of information needed to address a given problem or issue and collect information relevant for his or her response to the problem/issue.

Principle 1a. The information fluent person will possess the critical thinking skills necessary to articulate a problem or issue clearly and assess the scope and types of information needed to conduct an informed study of the problem/issue.

Principle 1b. The information fluent person will be conversant with a number of access methods, techniques, and technologies to enable an effective and efficient collection of information of the identified type.

Principle 1c. The information fluent person will possess the skills to evaluate critically any information collected as to its reliability, authenticity, relevance to the problem/issue at hand, and inherent bias.

Principle 1d. The information fluent person will understand the legal and economic issues inherent in the use of intellectual property and employ and cite sources in a ethical and legal manner.

Performance Indicators: Given the need to address some problem or issue – perhaps an incomplete, unstructured, ambiguously phrased problem/issue – a person understanding the above principles should be able to accomplish the following. First, he or she should be able to formulate the problem in such a way that allows the articulation of the scope and types of information needed to better understand the problem, its implications, its context, its sources, and its history. Once the needed scope and type of information have been determined, the person should be able to apply the most appropriate methods and technologies for locating and retrieving relevant information, applying critical thinking skills to evaluate each unit of information retrieved for its authenticity, reliability and relevance. Once the appropriate information has been assembled, the person should know how to assess the intellectual property rights associated with the information and seek appropriate releases and/or permissions before incorporating the information into his or her own work.

Principle 2: The information fluent person will be able to assemble and effectively analyze the appropriate body of information in order to solve a problem or resolve a question.

Principle 2a: The information fluent person will be able to manage the complexity involved in applying a body of information to the solution of a problem.

Principle 2b: The information fluent person will be able to reason about a problem and the body of information related to the solution of a problem.

Principle 2c: The information fluent person will be able to evaluate proposed solutions to a problem based on the body of relevant information at hand.

Principle 2d: The information fluent person understands and will be able to express some of the limitations of the process involved in deciding on a solution to a problem or answer to a question.

Principle 2e: The information fluent person will appreciate some of the costs, benefits, liabilities, advantages, and implications of a proposed solution to a problem.

Performance Indicators: For problem-solving, complexity has several forms. The ability to assemble a large body of information efficiently is an advantage of information technology. But, deciding on what is relevant is more difficult. The information fluent individual can apply methods to summarize, sample, or separate what is relevant from a large body of information. For example, it is often useful to apply visualization methods to a large collection of numeric data in order to grasp better trends or relations among the data. Effective problem-solving often begins with reasoning about the problem itself. What is the nature of the problem? What are its specifications? What counts as a solution?

Solving the problem also requires reasoning about a body of related information from that domain. Facts often have connections or correlation. The information fluent individual can recognize and express some of these connections and derive conclusions that suggest new information relevant for the problem. Few problems or questions have simple, direct solutions. Instead, complex problems have a variety of suggested solutions. The information fluent individual can choose among proposed solutions based on the evidence of the body of information. What are potential solutions? Which are more strongly supported by the evidence.

Most forms of reasoning are fallible. The information fluent individual can identify the liabilities and limitations of a proposed solution to a problem in addition to the strength of its evidence. For example, an information fluent individual should be able to understand how to test conclusions drawn from the analysis and what would corroborate or disconfirm these conclusions.

Often, the choice of a solution for a problem has implications. These implications may involve differences in the expense of time, energy, and material goods; they may affect the interests of others; they may impede or contribute to collateral goals or ends. The information fluent individual can recognize and articulate some of these attendant outcomes. For example, the choice among proposed solutions is often mediated by an analysis of their implementation costs.

Principle 3. The information fluent person will be able to organize the articulation of the problem or issue addressed, relevant background information, and the problem analysis and conclusions derived from this information into a coherent argument appropriate for the intended audience.

Principle 3a. The information fluent person will possess the skill to articulate a problem or issue coherently and clearly, identifying the specific component(s) of the broader issues that his or her analysis addresses.

Principle 3b. The information fluent person will possess the skills to present coherently background information and the views and findings of others about the given issue, accurately representing the sources of information and opinions presented.

Principle 3c. The information fluent person will possess sufficient knowledge about and skills in the use of presentation methods, techniques, and technologies appropriate for the effective presentation of his or her findings to others.

Performance Indicators: Given the identification and analysis of appropriate information to reach some conclusions about a given problem or issue, the information fluent person will be able to articulate those findings in a coherent convincing manner to others. More particularly, such a person will possess the organizational, planning, and hierarchical thinking skills necessary to construct an effective connected sequential argument. These skills will involve the ability to describe adequately the issue or problem being considered, its context and history, and the work others have done in addressing it. In addition, the information fluent person will have the ability to clearly identify the aspect of the problem or issues he or she is focusing on, the analysis and synthesis conducted, the conclusions reached, and how the accompanying information and analysis support these conclusions. Finally, such a person should be able to organize and effectively present his or her findings employing the presentation technology most appropriate for the intended audience.

Principle 4. The information fluent person will be a critical and intelligent information consumer.

Principle 4a. The information fluent person will possess the skill to recognize suspect or incorrect information as a passive recipient of information.

Principle 4b. The information fluent person will possess the skills to analyze information received for misleading implications, unwarranted conclusions, and unfounded trends.

Performance Indicators: We are constantly bombarded with “information” in our daily lives – even when we are not in an active information-search mode. The information fluent person will be aware that all information is potentially biased, misleading (whether intentional or not), and incorrect and will have the critical thinking skills to analyze any information received with this in mind. More particularly, the information fluent person will have the skills necessary to recognize the blatant misuse of statistics and charts, the abuse of logical arguments, the statement of unsubstantiated claims, and reliance on undocumented or unreliable sources.

APPENDIX II: AGENDA OF THE ACS INFORMATION FLUENCY SYMPOSIUM

ACS Symposium: Toward Information Fluency in the Liberal Arts
November 19-21, 1999
ACS Technology Center
Southwestern University

Friday, November 19

- 3:00 Welcome
- 3:15: ACS Pilot Program Report
"Toward Information Fluency in the Liberal Arts"
Pilot program group will report on their position paper and the work conducted on information fluency at their pilot workshop in July, 1999.
Robert A. Shive, Millsaps College
- 3:45 **Barbara Brown**, Library Director, Washington and Lee University, "Moving Targets and Slippery Slopes: Evaluation and Assessment of Information Fluency"
- 4:00 Break
- 4:15 **Susan K. Hagen** Assoc. Dean of the College, Birmingham-Southern College,
"theRecord.bsc.edu: Portfolios for Assessment and Advising"
- 4:30 **Fran White**, University of Richmond, "A Liberal Arts Education and Technology Proficiency - Making the Connection with Tek.Xam"
- 4:45 **Ross Scaife**, Assoc. Prof. of Classics, University of Kentucky, "Informatics Across the Curriculum: First Steps at the University of Kentucky"
- 5:00 **Hugh Blackmer**, Science Librarian, Washington and Lee University, "Geographical Information Systems: an Insurmountable Opportunity?"
- 5:15 **Jim Elmborg and Mary Fairbairn**, Furman University, "Furman's Mellon Summer Workshops for Students and Faculty"
- 5:30 David Brown, Wake Forest University, "Introduction to Keynote Address: Preliminary Questions"
- 6:00 Dinner and keynote address by **David Brown**, Vice President & Dean of Int'l Center for Computer Enhanced Learning (ICCEL), Wake Forest University, "Information Fluency and Active Learning"
Linda McCombs Ballroom, second floor of the McCombs Center
- 7:30 Breakout Groups
Divide into groups to discuss the 5 aspects of information fluency:
Standards
Faculty/Librarian/Technology Support Staff Training Faculty/Librarian/Technology Support Staff
Collaboration
Curriculum Development
Assessment
- 9:00 Adjourn

Saturday, November 20

- 9:00 Breakout Groups Continue (ACS Tech Center)
- 10:15 Break
- 10:30 Breakout Groups
- 12:00 Lunch (McCombs Student Center)
- 1:30 Breakout Groups Report to Entire Group
- 3:30 Break
- 3:45 Plenary Session
Summarize significant conclusions of symposium, address questions and concerns, and outline future directions for dissemination, etc.
- 5:30 Adjourn

6:45 Dinner

APPENDIX III: ORGANIZATION

Organization of the Effort for the Dissemination and Collaboration

This important and exciting effort will be organized via an overall steering or coordinating committee, with representatives drawn from faculty, library and information technology staff. Each group, which has a separate organization, will supply representatives to the overall committee, thereby ensuring that the interest of all three groups will be considered throughout this undertaking. The group will be drawn from those especially conversant with information fluency issues and will be widely representative of ACS membership.

The group will group will work on a regular basis with two ACS staff individuals, one being the director of the organization's technology program and the other the directory of ACS library programs. The ACS president will be a central figure in the discussions, meetings and decisions of all these groups.

The board meeting group will report regularly to the ACS council of deans, which is the effective managing committee of the entire consortium. The ACS presidents will be continually informed of developments within the project and will discuss and review the program on a regular basis. In between meetings of the deans and the presidents, written reports will be circulated and posted on the ACS Information Fluency home page: <http://www.colleges.org/~if/>.