

Department of the History of Science
Plan for Assessment of Student Learning
Revised July 28, 2006

Introduction

Discussion of Developments Since 1995 and Summary of Plan Revisions

In the 1995-96 academic year, the department submitted its plans for assessment of our undergraduate major and our graduate program. In September 1996, we submitted our first assessment report on the undergraduate program along with a preliminary assessment of our graduate program. Over the summer of 1998, we completed and submitted an additional assessment report on the graduate program based on in-depth interviews with a sample of our graduate alumni.

Since 1998, we have continued to conduct assessment activities, but not always in accord with our plan. In the summer of 2001, we surveyed all our undergraduate alumni by mail. In spring 2004, we began a study of equity and climate in the graduate program; a component of this study involves assessment of graduate student learning.

These assessment activities have required a substantial amount of faculty time, given the very limited staff available in a small department like ours. Although some of the results have been useful, our general conclusion is that the knowledge gained is not commensurate with the effort expended. Little of what we learned was new, and we identified few problems in areas within our control.

Our revised assessment plan, therefore, focuses on activities that will be both more useful and less demanding of faculty time. There are two areas of effort. First, we feel that qualitative data collected through relatively open-ended personal interviews will be more useful than formal surveys. We plan to conduct such interviews with both undergraduate majors and recent graduate-student alumni. Second, we plan to expend effort compiling data that we already collect, in order to provide it in a format suitable for assessment.

Finally, we have also decided to add another category to our assessment plan, assessment of our contributions to general undergraduate education. Most of our undergraduate teaching is not devoted to our majors, but rather to general education courses that help bridge the gap between the sciences and the humanities. We clearly need to assess this important component of our teaching mission.

Overview of the Department of the History of Science

The Department of the History of Science at the University of Wisconsin-Madison houses one of the largest, broadest, and most prestigious academic programs in the United States for the history of science, medicine and technology. Founded in 1941, it was the first history of science program to exist as an independent academic department. The department's thirteen tenured and tenure-track faculty members and affiliated scholars provide broad coverage of the field, with expertise in the physical, biological and social sciences from the Middle Ages to the present; medicine from the early modern period to the present; and technology from the nineteenth century to the

present. The department has strong geographic coverage of Europe and the United States, with growing expertise in non-Western areas.

The department's strength in history of medicine is bolstered by close cooperation with the Department of Medical History and Bioethics in the School of Medicine. Five of our governance faculty have tenure homes and are primarily budgeted in the Medical School. A sixth faculty member has a 50/50 tenure and budget split with Medical History and Bioethics, but with a tenure home in History of Science. In addition, department faculty are active in several programs, among them Women's Studies, Integrated Liberal Studies, and Science and Technology Studies.

Because our department cuts across two colleges and several programs, it is difficult to disaggregate efforts specific to Letters and Science. Our graduate program is run collectively by the entire department, and most of the undergraduate offerings in Medical History are cross-listed with History of Science. Many of our key freshman-level undergraduate courses are offered through ILS. Many of our assessment activities will, therefore, cover the educational efforts of all department faculty.

The remainder of this plan will examine in turn the undergraduate major, general undergraduate education, and the graduate program.

Undergraduate Major

Overview of undergraduate major

The History of Science major gives students the opportunity to examine the changing historical content of the sciences, technology, and medicine, as well as their interaction with the surrounding culture, using the methods of the humanities and, to a lesser extent, the social sciences. The department's interdisciplinary outlook permeates our undergraduate major; no other humanities major requires six intermediate or advanced course credits in the sciences. In addition to the History of Science major, we also offer a joint major with History; this joint major is administered in cooperation with the Department of History.

The number of majors remains relatively small. Over the past ten years, we have graduated annually an average of roughly ten History of Science majors and a few more joint majors in History and History of Science.

Since our last assessment plan, we have significantly revised our undergraduate major to reflect better the goals of the program. In 1996, we restructured and simplified the History of Science major, increasing the number of required credits in History of Science and removing the three "tracks" that required students to focus on a particular sub-area of the field. By eliminating this requirement, we hope to increase students' understanding of the commonalities and differences across fields of science, technology and medicine. We have also added an honors option for the major.

Ideally, our 1995 assessment plan should have contributed to the redesign of the major in 1996. The results of the 1995 plan were not available in time to affect the redesign. But even had these results been available, the data collected did not provide the kind of information that would have helped in the redesign.

Learning objectives and goals

The goals of the major have not changed significantly since the 1995 plan, but are presented here in a more succinct form.

The major has two goals, first those specific to the history of science, and second those common to most disciplines in the humanities. The field-specific goal is to help students develop a broad historical understanding of science, technology, and medicine, both as ways of knowing and as changing cultural phenomena. In common with other humanities majors, students who complete our major will learn skills in critical reading and writing and in the use of historical data to create their own arguments.

The field-specific goals can be broken down as follows:

- We expect students to gain an overview of how various aspects of science, technology and medicine emerged over time. We expect students to gain this knowledge primarily, but not exclusively, in 200-level courses.
- We expect students to gain a more detailed understanding of science, technology or medicine in specific disciplines, national contexts, or historical periods.
- We expect student to gain insight into the complex, two-way interactions between science and other aspects of culture and society, particularly as implicated in the functioning of a modern democratic society.

The common goals consist of the following:

- We expect students to develop critical reading skills and to use these skills to analyze both primary and secondary historical texts. Critical readings includes the ability to understand the argument of a text, to uncover the implicit assumptions in the text, and to evaluate the cogency and flaws of the text.
- We expect students to develop the writing skills to present clear, carefully reasoned interpretations of the historical evidence. We expect students to be able to defend these interpretations persuasively and honestly.

Strategies for measuring students' performance on program-level goals

In our 1995 assessment plan, we proposed two assessment techniques. The first was to have a faculty committee review the final papers of the capstone seminar taken by all History of Science majors. This seminar requires the production of a major historical paper based on research in primary sources. The second technique was a mail survey of our undergraduate alumni.

We propose to continue the capstone assessment, while abandoning the alumni survey. We propose to add two new assessment procedures: an annual report by the instructor of the capstone course, and a periodic set of exit interviews with a sample of graduating majors.

The following revisions apply to items from the 1995 assessment plan:

- Alumni survey (dropped). For the 1996 assessment report, we conducted a mail-in survey of a sample of recent alumni. We did not receive enough responses in time for the report deadline to draw any significant conclusions.
In summer 2001, we repeated the alumni survey, including in our sample all undergraduate alumni since 1974. Our response rate was 12 percent. The answers to the questions were overwhelmingly positive. Nevertheless, in terms

of assessing student learning in the major, the responses provided little useable information. Given the cost and effort involved, we have decided to abandon with assessment technique in the current plan

- Capstone paper assessment (retained). The 1995 plan proposed having a faculty committee assess the papers from the capstone course every five years. This assessment has been done once, in 1996. The assessment was useful, but it did not sufficiently address the specific goals for the major enumerated in the 1995 plan.

In the future, the charge to the assessment committee will specifically ask that the committee to address the learning objectives and goals for the major. We will continue this assessment, but at three-year rather than five-year intervals.

The following are the new assessment techniques for the undergraduate major:

- Annual report from the instructor of the capstone course. Our capstone course (Hist Sci 555) is taught every spring in one section of between eight and 15 students. The instructor of this course is well positioned to assess to whether our majors are achieving the learning objectives listed in this plan. We propose to require the instructor of this course to submit a brief report assessing the general level of student preparation for each of the five learning objectives for the major.
- Exit interviews with graduating majors. Every three years, we will conduct exit interview with all of our graduating majors in History of Science. We plan to employ a graduate student to conduct these interview and to write a brief report summarizing the results in relation to the five learning objectives of the major. Students will be granted anonymity.

Next steps

We believe that the new plan for assessing the major is both realistic and useful. We will carry out our assessment according to the following schedule:

- Capstone paper assessment: fall 2006 and every three years thereafter
- Annual report from capstone course instructor: spring 2007 and annually thereafter
- Exit interviews: spring 2007 and every 3 years thereafter

General Education

Overview of contributions to general education

Course credits for our majors account for only about 10 percent of our undergraduate teaching. Most of our undergraduate teaching is in service courses, which typically provide either humanities (H) or natural science (N) breadth credit. These courses help students grasp the connections between humanistic and scientific approaches to knowledge, and therefore play an essential role in promoting the principles of liberal education in the college.

We typically teach six large TA-taught courses annually, with enrollment capacities ranging from 80 to 320 students. Much of this teaching is done through the Integrated Liberal Studies program, where we teach a two-course sequence in the

history of science, ILS 201 and 202. Our 300 and 500-level courses are also primarily filled by non-majors; most of these courses do not require previous course work History of Science.

Learning objectives and goals

The objectives of general education courses in History of Science are two-fold.

- For students not majoring in a scientific or technical field, the goal is to convey knowledge of the real-world functioning of science, technology or medicine in specific historical contexts, knowledge that will make these students better informed participants in our technically complex and ostensibly democratic society.
- For students pursuing scientific, technical or medical careers, the goal is to make them aware of the types of problems faced in the past by people working in these fields, in the hope that this awareness will inform the choices they make in their own careers.

Strategies for measuring students' performance on program-level goals

Assessment of these goals is difficult. We propose to analyze existing data collected through students evaluations, and to use our analysis of this data to revise the evaluation forms so that they more specifically address the general-education learning objectives, as follows:

1. Plot 5-year data of course evaluations for the "overall course" and "professor" questions, subdivided into 200-level lecture courses, upper-level (300-500) lecture courses, and undergraduate seminars (Hist Sci 180, 280, and 555). While this analysis is not precisely a measure of student learning, it will serve to identify problem areas that need focused assessment efforts.
2. Compile student comments related to the learning objectives from undergraduate course evaluation forms completed during the previous year. Although our existing course evaluation forms do not specifically address learning objectives, students often provide comments that do so.
3. Using the compiled comments from items 2, revise the course evaluation form to address directly the learning objectives

Next steps

Here is the schedule for the assessment items listed above.

- Items 1 and 2 above to be completed by a student hourly employee during fall semester 2006.
- Item 3 to be undertaken by a faculty committee during spring semester 2007.

Graduate Program

Overview of graduate program

The Department of the History of Science is one of the leading graduate programs in the history of science, medicine and technology in the United States, having awarded close to 150 Ph.D.'s since 1952. Although a few students are admitted for the terminal M.A. degree, the vast majority of our graduate students enter the program for the Ph.D. In assessing graduate student learning, therefore, this plan will focus on how well we prepare students for the Ph.D. As we mentioned in the program overview, the graduate program is run in close collaboration with the Department of Medical History and Bioethics, making it impractical to focus solely on contributions from L&S faculty.

Learning objectives and goals

Graduate students in history of science, unlike those in most other programs, usually have not majored in the field as undergraduates. The Department is thus particularly self-conscious about developing the following specific skills in its students by the time they complete the M.A.:

- Mastery of a body of relevant historiography, including the ability to engage with its arguments;
- Ability to formulate creative, significant, and "doable" research questions that engage with the historiography (criticism, extension, refutation, restriction, qualification, etc.);
- Ability to plan and carry out extensive and careful research in primary sources (*Sitzfleisch*, detective work of research, analysis, contextualization);
- Ability to weave a historical narrative from diverse primary sources and frame it as a valuable contribution to existing scholarship;
- Ability to produce a persuasive, well-structured, and lucidly written argument presented according to the scholarly and publication norms of the discipline.

The department requires demonstrated promise in each of these skill areas before admitting students to the Ph.D. program. While in the Ph.D. program, students are expected to refine, hone and deploy these skills at a greater level of sophistication in the production of the dissertation. In addition to these scholarly skills, we expect our students to develop the ability to find their way within the scholarly community by understanding, for example, the most appropriate ways to disseminate the results of their research (conference papers, refereed articles, monographs).

Strategies for evaluating students' performance on program-level goals

The existing structure of our graduate program provides considerable assessment of individual student learning. The department already uses these individual assessments for program-level assessment, but informally. For example, the department is considering creating a new research practicum for first-year students in response to concerns about the program-level quality of the M.A. papers.

In our updated assessment plan, we propose to make more explicit this informal program-level assessment. In addition to formalizing existing assessment procedures,

the department will continue to monitor the success of its Ph.D. graduates, and will conduct a pilot series of exit interviews of recent graduates.

The updated assessment plan for the graduate program consists of the following three items:

- The M.A. paper as an instrument for program-level assessment. Graduate students normally submit the M.A. paper in the spring of the second year. All faculty members read, evaluate, and jointly discuss every M.A. paper. This labor-intensive process of assessment provides a direct measure of student learning assessed by the entire faculty, which inform our judgments about the quality of graduate education as well our judgments about individual students.

We propose to formalize this assessment as follows. The chair will appoint a subcommittee of the department with the charge of distilling and recording the most notable program-level lessons evident in the aggregate of M.A. papers for a given year. The subcommittee's report will provide the basis for a formal faculty-meeting discussion of the means of improving student performance, as well as faculty teaching and advising in relation to our program goals.

- Assessment of success of Ph.D. graduates – employment data. In our 1996 report, we included the results of a survey of book production among the graduates of leading programs in the history of science. These results showed that UW-Madison PhDs led the field with both the highest rate of publication of first books and the highest absolute number. This result provided a strong indirect measure of the success of our graduate students in achieving the learning objectives of the program.

However, book production can only measure the long-term success of our graduates, as the average time to publication is about seven years. As a more timely measure of success, we propose to track the employment of our Ph.D. graduates from the last 15 years in order to discover how many are employed in academic positions related to their studies. This data will be recompiled every three years.

- Exit interviews of graduating Ph.D. students. In 1998 Dr. Sarah Pfatteicher (LEAD Center) conducted in-depth interviews of six of 24 Ph.D. graduates between 1987-97. While informative about longer term trends, responses to this survey often concerned issues that were no longer current owing to personnel and curricular changes. The most concrete problem identified concerned the quality of historiographic training in the graduate program. The problem had been known for some time already, and was solved by rearranging teaching assignments. While the solution was obvious without any formal assessment, the assessment may have contributed modestly to the timing of the solution.

In 2004, the graduate advisor Judith Houck documented gender asymmetries in the relative apportionment of teaching and fellowship support. To examine the matter, the chair appointed a gender equity study committee composed of one graduate student, a senior lecturer, and two faculty. To investigate this problem further, the committee has planned exit interviews with recent Ph.D. students. For these interviews, the committee has developed a set of questions that covers the full range of the life of the Department, including the quality of student learning (see attached document).

Next steps

The following schedule will be used to implement the assessment strategies.

- M.A. paper assessment – annually, beginning April or May 2007
- Ph.D. employment data – every 3 years, beginning fall semester 2006
- Exit interviews – every 3 years, beginning August 2006

Appendix
Survey Questions for Recent Ph.D. Exit Interviews
 Draft, July 2006

Background

- What was your undergraduate major?
- What kind of undergraduate institution did you attend?
(Small Liberal Arts College, Small University, Large University)
- Did you have any prior experience with graduate school before you started at UW-Madison? if so, in what field?
- How/why did you decide to pursue a degree in the History of Science?
- How did you hear about the history of science program at Wisconsin?
(knew someone who attended the program, a professor recommended the program, HSS, SHOT, or AAHM website, search engine, read a book by someone who worked here, other)
- When you started in the program, what did you think you wanted to study?
How far removed was your final topic from where you started?
- What is the most influential article/book you read in graduate school (if you remember)?

Life beyond academics

- What was your partner status when you entered graduate school? (committed partner, non-committed partner, single)
- What was your partner status when you left graduate school? (committed partner, non-committed partner, single)
- Do/did you have family living with you in Madison? What is/was their relationship to you?
- How would you describe your social network while in graduate school?
- Name a non-academic activity in which you participated regularly.
- What non-academic resources do you wish you had had access to?

Departmental Climate

- How well do you think your academic interests fit with the interests of other members of the department (faculty and/or students)?
- Did you feel like you were an atypical graduate student in any way? Explain why/why not. (class, income, age, gender, race, nationality, prior experiences, family background, academic interests, none-of-the-above)
- Was the gender climate of the department ever an issue for you or anyone you knew? Elaborate if you wish.

- How comfortable were you with asking questions in the following places...

COMFORTABLE?	Extremely	Rather	Somewhat	Slightly	Not at all
Asking questions in class					
Asking questions at brownbag					
Asking questions at colloquium					

Asking questions at conferences					
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- What would have made you more confident in any of these situations?
- Describe the effect of brown bag on departmental culture/ climate.
- Describe the effect of colloquium on departmental culture/ climate.
- Describe the value of each of these activities in your development as a scholar?

Mentoring

- At what point did you feel like you identified what it is to be a historian of STM? How did this make you feel? (ostracized, included, tangential, fascinated, ambivalent, irrelevant)
- If you had to identify a single person as your most important resource helping you in your graduate studies, you would identify that person as _____. (fellow graduate student in the department, fellow graduate student not in the department, faculty in the department, faculty outside of the department, academic non-faculty associate of the department, academic non-faculty not associated with the department, non-academic)
- How did you pick your advisor?
- How advanced in their career was your advisor(s)? (assistant, associate, full)
- What is the best thing your advisor does/ did for you while you were in grad school?
- What is one thing your advisor could have done better while you were in grad school?
- Describe your intellectual 'fit' with the department.
- Please rate the importance of the following factors to your overall graduate school experience.

IMPORTANT?	Extremely	Rather	Somewhat	Slightly	Not at all
Your advisor					
Other HSTM faculty					
Faculty from other departments					
Graduate students in the department					
Grad students in other departments					
Non academic friends and activities					

- Please rate your satisfaction with these same factors.

SATISFIED?	Extremely	Rather	Somewhat	Slightly	Not at all
Your advisor					
Other HSTM faculty					
Faculty from other departments					
Graduate students in the department					

Grad students in other departments					
Non academic friends and activities					

Funding

- As a graduate student, I made money by **teaching** as a (TA, lecturer, neither, both).
- How valuable was your teaching experience?
- As a graduate student, I had made money by helping faculty with their **research** as a (PA, RA, neither, both).
- How valuable was your research experience?
- As a graduate student, I received funding to attend academic **conferences** from (the department, resources outside the department, neither, both).
- How many conferences did you attend as a graduate student, and when in your graduate school career did you attend?
- Which conferences did you attend, and how valuable were they?
- As a graduate student, I received funding to conduct my own independent **research** from (the department, resources outside the department, neither, both).

Career Development

- If you chose to leave the program, is there anything the department could have done to make your decision to leave more difficult?
- Do you feel suited for the HTSM “profession”? for academics generally? Explain why or why not.
- How did you learn to do research?
- How did you learn to write a book review?
- How did you learn to write a chapter?
- How did you learn to give a conference paper?
- Describe the most important skill you developed while a graduate student at UW-Madison? (languages, how to read a book/paper, speaking in a public forum, constructing an argument, etc.).

Career objectives

- What were your career objectives when you joined the program?
- What were your career objectives when you left the program?
- Have they changed since then?
- What are you doing now?

Doing it all over again...

- Did you feel like there was a turning point in your graduate career? If so, describe it.
- If you had to do it all over again, what would you have done differently? (dissertation topic, department, university, advisor, nothing, other)
- What were critical factors in your decision to stay or leave graduate school?
- If there was one thing you wished you had known at the outset of your graduate career, what would it have been?
- What is your most vivid memory from graduate school?