Overview of Senior Capstones

The senior capstone course, or project, is a culminating experience in which students are expected to integrate, extend, critique, and apply the knowledge gained in the major or concentration. It is usually considered to be an integral part of the study in depth portion of a curriculum. “Study in depth” addresses the inquiry process so that students experience the complexity of knowledge in a discipline; it is more than mere bureaucratic accumulation of courses. Such study involves students in the process of developing and assessing knowledge in a discipline.¹ Many institutions also foster the development of capstone courses to focus on the goals of a general liberal arts education. At Southern Illinois University Edwardsville, for example, the Senior Assignment serves as a demonstrable connection between the student’s major area of study and the full breadth of general education skills and competencies.²

The capstone course also provides a venue for assessing how successfully the student has attained the overall goals of the concentration curriculum. Capstones are effective assessment activities because they are a direct measure of student learning, they are authentic since they are created as part of normal classroom or curricular activities, and they are efficient since they take advantage of existing sources of data.³ A study by Henscheid⁴ in 2000 found that almost half of 707 regionally accredited institutions surveyed used capstones as part of their institutional assessment program. Of these institutions, smaller colleges and universities were more likely to use capstones for assessment than larger ones. A recent survey of HEDS⁵ institutions found that of the 58 responding institutions, 55% required all graduates to complete some kind of senior capstone experience in the major.

Hamilton’s Senior Program

At Hamilton all students are required to complete a senior capstone experience. The following text, from the college catalogue, describes Hamilton’s Senior Program:

All students are required to complete the Senior Program in their concentrations. Each department and program of concentration has designed a senior program that serves as an integrating and culminating experience for the concentration. Students use the methodology and knowledge gained in their first three years of study. Building on their courses and showing their increasing ability to work independently in terms of both motivation and subject matter, seniors are required to produce a significant synthesis of knowledge by means of one of the following: a research project leading to a written, oral or visual creation; a seminar for concentrators, including a major presentation and research paper by each student; or comprehensive examinations ideally involving both written and oral components. This requirement allows seniors to demonstrate at an appropriate level their mastery of content and the methods of the discipline.

² http://www.siue.edu/assessment/seniorassignment/index.shtml
⁵ Higher Education Data Sharing Consortium is made up of private, mostly liberal arts institutions.
In the Fall of 2008 department chairs were asked to provide information to the institutional research office on senior programs, specifically related to the assessment of senior capstones. A total of 16 departments provided information, ranging from basic descriptions of the senior program to an actual paper, presented to a national audience, consisting of an overview and evaluation of the senior seminar program in a specific department. Several departments provided syllabi from senior seminar courses. Additional information was obtained from the college catalogue, which contains descriptive language on senior programs and as well as course descriptions, and department web sites.

The format each concentration uses to meet the senior program requirement varies widely. Terms used in descriptions from the college catalogue and web sites include seminar, thesis, project, and performance. Within each of these categories there are a wide range of differences. Some departments and programs require a two-semester seminar, while most require only one. For some seminars an extensive research paper is required, while for others the focus is on discussion and presentation. Some departments require independent research projects or theses, where the student works on-on-one with a faculty member. In many of the arts concentrations the senior project may be, in its final form, a performance or exhibition. And, many concentrations require additional or extended seminars or projects for students wishing to receive departmental honors.

While the formats differ greatly, there are many common elements across senior programs. First, a review of department descriptions and syllabi of senior program courses found common themes of integration, culmination, and demonstration of accumulated skills. Second, all departments and programs contain a writing component, from entire theses to written project proposals. Third, almost all contain an oral communication component. Oral communication requirements range from short presentations in a classroom setting to project or thesis presentations to the entire college community. The concentrations of French and Hispanic Studies also require a test of oral proficiency in the language beyond the usual seminar or research project.

A review of department and program documentation also show little evidence of systematic assessment of senior capstones. While the broad parameters of the requirements are developed by the entire faculty within the department or program, each faculty member seems to either develop his or her own seminar requirements or evaluate students on an individual basis. There was no evidence that departments or programs (except one) had standard guidelines or rubrics to follow in the assessment of senior projects, and there was little documentation of the connection between curricular goals and senior program goals.

There were, however, departments or faculty members who have reviewed or analyzed their senior capstones in some form, or published capstone goals that align with curricular goals. Here are some examples:

- **Mathematics** – In 2007 Professors Bedient and Cockburn presented a paper to the Mathematical Association of America on the Math Department’s senior seminar. They presented an overview of the senior program at Hamilton and provided details and an evaluation of the senior seminar they each taught. Through the seminars students were subjected to rigorous problem-solving exercises and confronted with broad philosophical questions that they had to address by “bring(ing) all of their intellectual tools to the table.” Overall, they found their seminar courses to be highly successful in engaging their students in the discipline of mathematics.

- **Anthropology** – Faculty members in the Anthropology Department developed a rubric to assess senior theses. The five criteria in which students are graded are viewpoint, voice, creative synthesis, ownership of ideas; logic/connections and research vigor; evidence; style and composition; and conventions. Within each criteria they list distinctive characteristics and how
those characteristics would be described under a scoring schema of A = Exceeds, B = Meets, C = Approaches, and D = Needs More.

- French – The French Department’s description of its senior program outlines three distinct requirements. All seniors are required to complete two seminars, one each term with at least one focusing on the pre-modern period. A thesis is also required, usually as part of the Spring seminar. Finally, a test of oral proficiency must be completed with an independent examiner in the Spring semester.

- Physics – Student outcomes in the Physics concentration fall into three categories: content (mastery of physics and its subfields), scientific writing, and presentation. Assessment of student work in the senior project includes evaluation of three talks (presentation and content), the written thesis (scientific writing and content), and the elements of engagement, productivity, independence and understanding (content, writing and presentation).

- Art – The Art Department developed a department-wide description of goals and objectives for the senior program, which also discussed curricular goals. For the project, multiple works are required, the number determined by type of media used. Student evaluation standards are defined, and expectations of quality and quantity of work by grade scale are described.

- Economics – The syllabus for the senior research seminar in Economics explicitly states that the goal of the course is to address a topic at an advanced level employing the tools learned in previous courses, tying together the outcomes of the curriculum and the capstone. It also identifies improved writing and oral exposition as important goals of the course.

Conclusions and Recommendations

The senior program is a key component of the Hamilton College curriculum. It helps assess the student’s mastery of disciplinary content as well as important cross-curricular outcomes such as writing, oral communication, and critical thinking. Assessing campus-wide outcomes in this program is especially important at Hamilton, where the “open curriculum” has no general education distribution requirements.

The process of assessment, however, is rather idiosyncratic within departments and programs. Very few programs have documentation of systematic analysis of students in capstones, and very few have documented the relationship between capstone goals and curricular goals. Since the senior program at Hamilton is based on “integration and culmination,” it would be helpful to be explicit about what is being integrated and culminated. As stated by Berheide (2007), best practice in assessing capstones is analyzing the projects systematically for the evidence they provide about program quality and to use that evidence to make curricular improvements.

There is no intention in the Dean’s office, however, to impose any kind of college-wide standard or process on senior program assessment. These capstone activities are complex and sophisticated endeavors, and it takes a great deal of disciplinary expertise on the faculty’s part to both channel the students’ energy and interests and to assess the quality of the final product. Students are learning a great deal in the process, both broadly (writing, oral communication, critical thinking, etc.) and about the discipline in which they are working. The goal is to describe the assessment activity that is already going on, and communicate how important learning outcomes are already being evaluated in senior projects across disciplines.
With the goal of autonomy and flexibility in mind, we encourage each department and program to consider one or more of the following activities in regards to assessment in the senior program:

- Periodically review and discuss, as a department, the senior capstone(s), with a focus on how they relate to overall curricular goals. Retain summaries of such reviews or discussions.

- Develop written capstone goals that align with departmental and College-wide curricular goals for all faculty members in the department or program to consider as they evaluate students in the capstone.

- Develop a grading rubric for all faculty members to follow when evaluating a project or thesis.

- Consider the use of external evaluators or submission of projects and papers for presentation at conferences. These provide external validation of the quality of student work.

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