Chapter XII: CAPSTONE EXPERIENCES: ASSESSMENT OF THE MAJOR AND LIBERAL ARTS AND SCIENCES OBJECTIVES

Capstone Course

Who takes it?
All seniors take a capstone course in their major.

When is it administered?
During the senior year.

What office administers it?
The faculty of the discipline. Some, but not all disciplines may use discussion of the capstone courses and portfolio work from that discipline to evaluate their discipline curriculum.

Who originates the capstone course and review?
The faculty of the discipline.

When are results typically available?
The fall following the year in which the capstone courses are given.

From whom are the results available?
The faculty of the discipline.

What type of information is sought?
The faculty may have particular concerns about different aspects of the curriculum.

Are the results available by division or discipline?
By discipline.

Are the results comparable to data of other universities?
No.

The university has multiple purposes for its assessment program including the improvement of student learning, the identification of program and university strengths and weaknesses, the encouragement of student self-assessment, and the demonstration of accountability to numerous stakeholders. To accomplish these objectives Truman requires all students to sit for standardized tests; conducts surveys of enrolled students, alumni, and employers; administers a holistically-scored writing assessment to all students, conducts a university-wide portfolio project, and expects all students to have a capstone experience in the major. The purpose of this report is to describe and analyze the purposes and benefits of capstone experiences.

In most major programs at Truman State University, the capstone experience is a course that seeks to integrate subfields and skills of the major and is taken in the final year of a student's course of study at the university. Many of these courses require that students demonstrate specified skills and knowledge that faculty in the major have developed as learning priorities. During the mid-1980's Truman (then Northeast Missouri State University) made many changes in its curricular requirements. Faculty were encouraged to develop a major curriculum that followed a sequenced rationale and culminated in a

capstone experience to synthesize the major. In 1986, Truman's Faculty Senate adopted a requirement for capstone experiences in all major programs. The goals for capstone courses ranged from providing a checkpoint for faculty and students at the end of a student's program to providing a link to the next point in a student's career such as graduate school or traditional employment.

Over the last decade, capstone courses have evolved. Faculty have developed many approaches to "capstones" and have discovered numerous benefits beyond the initial expectations. Capstone courses help students to integrate the subfields, skills, and perspectives of the major. They prompt faculty discussion, contributing to increased coherence of the major's course of study. The courses create opportunities for multiple assessments to be made of the major and liberal arts and sciences objectives by the faculty themselves. It is the faculty's direct analysis of the students' cumulative learning that makes this method of assessment potentially so beneficial.

In addition to assessing learning goals specific to the major, faculty have also been asked to integrate university-wide liberal arts and sciences objectives with the major. As Missouri's liberal arts and sciences institution, Truman is committed to recruiting high ability students and to providing them with a quality education. In its plan submitted to the state of Missouri, Truman developed a three-part learning outcomes paradigm based on knowledge, skills, and attitudes. This paradigm provides a surprisingly common language for comparing the university's capstone experiences that at first seem distinctly varied.

GOALS FOR STUDENT LEARNING

Truman seeks that its students graduate with in-depth knowledge in the major comparable to that received from the best universities in the country and the world. Thus the university emphasizes that a student's learning should be cumulative and should cover the breadth of the discipline. The graduating student is also expected to demonstrate the ability to integrate knowledge and to make interdisciplinary connections.

Skills that have been identified as critical objectives for the university include the ability to write various types of papers, to speak comfortably both in formal and impromptu presentations, to work collaboratively with fellow students, and to think critically. Assessment of the third goal, attitudes, has included varied levels of attention, but many of the majors have developed several of the following four foci:

1.   Does the student demonstrate openness to more than one position and make fact / value distinctions?

2.   Does the student possess positive self-esteem and practice self-evaluation?

3.   What are the student's attitudes toward the university and the major?

4.   Does the student demonstrate ethical and social responsibility?

SELECTED ASSIGNMENTS FROM CAPSTONE COURSES:
KNOWLEDGE, SKILLS AND ATTITUDES

Strategies for senior experiences to demonstrate and build on student knowledge of the discipline range from presenting an article review, to writing a formal thesis or paper, to designing a research project, to sitting for a locally-developed comprehensive exam. Independent of the capstone course, the

university requires each graduating student, if possible, to sit for a nationally standardized exam in the major field. Interdisciplinary connections are encouraged through such mechanisms as selected case studies, required interdisciplinary portfolio entries, and exit interview questions that ask the students to identify connections between their major and minor programs. Interdisciplinary connections also will be encouraged through the Liberal Studies Program. The University's portfolio assessment of the liberal arts and sciences is implemented through capstone experience courses. Faculty in the major are asked to collect the portfolio and are encouraged to add specific portfolio requests pertaining to objectives in the major.

To assess student skills such as communicating and collaborating, faculty might ask students to formally present their research to the class, to argue and defend an issue position, to sit for an oral examination, or to work in groups to solve a problem or conduct a research project. Many of the capstone courses also attempt to consciously assess various levels of critical thinking from the ability to apply concepts and theories of the discipline to new situations, to analysis, synthesis, and evaluation. Other disciplines focus more generally on problem-solving ability. Case studies, bibliographic literature reviews, argumentation papers, audience analysis, canon discussions, and student self-evaluation each prove to be popular assignments that combine knowledge objectives with skills assessment.

Objectives regarding attitudes are more difficult to specify and assess than knowledge and skills, but faculty in many majors have developed a consensus on several objectives and have developed approaches to assess them. Case studies can present students with ethical dilemmas to resolve, and role-playing can be an effective means for demonstrating multiple perspectives to an issue. Students may be asked to debate a position other than the one they hold. Many of the capstone courses provide multiple opportunities for students to self-assess. Students might be asked to identify their strengths and weaknesses during an exit interview or to evaluate the curriculum. Every student is asked to evaluate the university and the major on university-wide surveys. Faculty in the major then receive the data on their majors as well as university averages.

CAPSTONE BENEFITS

Benefits of the capstone courses are varied, but perhaps an examination of the reported benefits of one of the capstones can best demonstrate some of the potential contributions capstone courses can make. Team-teaching the capstone course brings opportunities several times a week for colleagues to reflect on and discuss student learning in the major. Inevitably, such discussions include references to the curriculum, specific assignments and teaching pedagogy. Faculty have the opportunity to learn teaching strategies and discipline subfields from each other. This is a particularly good opportunity to mentor new faculty about the importance of discipline objectives, high expectations for students, and frequent faculty-student interaction. Through collegial discussions, program objectives are shared, cohesiveness increases, and improvements are planned.

Students also benefit from the experience. They use their cumulative knowledge and skills to integrate and further develop their understanding of the major. Student's efficacy and satisfaction increase because they are asked to accomplish challenging tasks and because they are provided the opportunity to critique the university and the major. Students report that they found it interesting to produce a selected portfolio reflecting on their college learning experiences.

Ultimately, in order for capstone courses to be successful assessment instruments, the instrument itself must be coupled with the interest of faculty who are committed to student learning. It is easier to merely comply with a mandate to develop a capstone course than it is to produce a course agreeable to all faculty that meets the objectives of integrating student knowledge and assessing student learning. Team-

taught courses enhance the opportunities for faculty conversation and collegiality. Majors that rely on one faculty member or that rotate faculty into the course, do not talk to each other nearly as often as faculty in the team-taught format. Several of the Truman disciplines have structured discipline meetings to expand the observations of the professor(s) responsible for the course to those professors who do not teach the course. Ultimately, it is this stage of the process, the conversation among faculty, that is the key to effective assessment. Program review specifications are adding a section asking faculty to document the conclusions of the discipline's strengths and weaknesses derived from the capstone. This is intended to encourage systematic conversation and review by faculty.

VARIOUS MODELS OF CAPSTONE EXPERIENCES

Since the university granted faculty in each discipline the autonomy to interpret the capstone requirement for their major programs, a wide variety of models has evolved. Several models are presented in the following pages showing the knowledge, skills, attitudes paradigm. These various models provide a more complete description of capstone courses at Truman State University.

CAPSTONE EXPERIENCE--ART

SENIOR SEMINAR AND SENIOR PROJECT

* TEAM TAUGHT   (Senior Seminar)

* COMMUNICATION EVALUATED (Senior Project) (by a committee of faculty)

* PROJECT DESIGN

* ORAL PRESENTATION

KNOWLEDGE

* DISCIPLINE CONTENT AREA
    Comprehensive Exam--Written
    Area Exam--Written
    Thesis/Position Paper
    Portfolio--Exhibition--Special Project (many BA students work with Dr. Shoaff to develop lesson plans or write papers as a capstone experience project as pre-MAE students).
    Senior Project Oral Defense
    Formal Oral Presentation

* INTERDISCIPLINARY CONNECTIONS
    Portfolio
    Issues Project

SKILLS

* WRITING
    Issues Project
    Thesis/Position Paper
    Portfolio

* SPEAKING--Extemporaneous
    Discussion
    Issues Project
    Senior Project Oral Defense

* SPEAKING--Prepared
    Formal Oral Presentation

* COLLABORATIVE SKILLS
    Issues Project

* CRITICAL THINKING

CRITICAL THINKING SKILLS

(examples: issues project, senior project oral defense, portfolio, exhibition, special projects)

*   COMPREHENSION AND APPLICATION
          Comprehensive Exam
          Area Exam
          Thesis/Position Paper

*   ANALYSIS
          Thesis/Position Paper
          Issues Project
          Exhibition/Portfolio

*   SYNTHESIS
          Thesis/Position Paper
          Exhibition/Portfolio/Special Projects

*   EVALUATION
          Thesis/Position Paper
          Discussion
          Oral Presentation

ATTITUDES ASSESSMENT

*   OPENNESS TO MORE THAN ONE POSITION AND RECOGNITION OF FACT/VALUE DISTINCTION
          Issues Project
          Discussion

*   REFLECTIVE EVALUATION OF SELF
          Senior Project Oral Defense
          Portfolio
          Videotaped Record Returned to the Students

*   EVALUATION OF UNIVERSITY AND MAJOR
          Examination/Analysis of Discipline Assessment
          (graduating senior interview project, similar to
          GSQ, bust assessment of art and art history only)

CAPSTONE EXPERIENCE--POLITICAL SCIENCE

SENIOR SEMINAR

      * TEAM TAUGHT
      * SEMINAR FORMAT
      * READ "CLASSICS"
      * THREE CREDIT COURSE

KNOWLEDGE ASSESSMENT

      * Papers Tied to Weekly Reading Assignments
      * Class Discussion
      * Comprehensive Exam
      * Research Design

SKILLS ASSESSMENT

      * WRITING
            Papers on Weekly Reading Assignment
            Literature Review Paper
            Research Design
            Portfolio

      * SPEAKING—Extemporaneous
            Class Discussion
            Q/A Session following Presentation on Research Design—as Discussant and
            Presenter
            Exit Interview

      * SPEAKING--Formal
            Discussant Presentation
            Presentation on Research Design

      * COLLABORATIVE SKILLS
            Classroom Group Work
            Peer Review of Research Design

CRITICAL THINKING SKILLS (Higher order thinking—various exercises in analysis syntheses, and argumentation.

      * Hypothesis Development Assignment

Capstone Experience--Political Science (continued)

      * Literature Review

      * Papers on Weekly Reading Assignments

      * Argumentation Proposition Papers

EXAMPLES OF CURRICULAR OR PEDAGOGICAL IMPROVEMENT FOR ENHANCING STUDENT LEARNING -- SKILL MATRIX for REQUIRED COURSES IN THE MAJOR

      * Political Science Methodology—Quantitative Research Project
      * Comparative Politics—Research Project Beginning with Research Design
      * Public-Policy Making—Government Documents Research

* Political Thought—Government Document Research
* Political Thought—Proposition Papers

STRATEGIES FOR USING PERFORMANCE IN THE CAPSTONE FOR ASSESSING PROGRAM QUALITY

* Team Teaching (teams rotate)
* Cross-Grading
* Program Review
* Program Indicators Reviewed Annually

CAPSTONE EXPERIENCE--BUSINESS ADMINISTRATION AND ACCOUNTING

* TRADITIONAL BUSINESS COURSE

* INHERENTLY INTEGRATIVE

* CASE STUDY/SIMULATION APPROACH

KNOWLEDGE ASSESSMENT

* DISCIPLINE CONTENT AREAS
    Comprehensive Exam
    Library Research Paper
    Case Studies/Simulations
    Class Discussion
    Synthesis Of Finance, Marketing, and Management

* INTERDISCIPLINARY CONNECTIONS
    Case Studies/Simulations
    Research Paper
    Discussion Of Current Issues
    International Strategies
    Ethics/Social Responsibility

SKILLS ASSESSMENT

* WRITING
    Case Studies/Strategic Audits
    Research Paper
    Essay Exams
    Writing Portfolio

* SPEAKING--Extempore
    Class Discussion
    Case Study Analysis
    Argumentation--Take a Position and Defend It
    Paper Defense

* SPEAKING--Formal
>> Group Presentation of Strategy Research Paper
>> Group Presentation and Discussion of Case Study

* COLLABORATIVE SKILLS
>> Group Papers and Presentations
>> In-class Application/Problem-Solving Exercises

CRITICAL THINKING SKILLS

* COMPREHENSION AND APPLICATION
>> Comprehensive Exams (in some sections)
>> Case Studies/Simulations
>> Research Paper
>> In-class Exercises/Group Work

* ANALYSIS/PROBLEM-SOLVING
>> Case Studies/Simulations
>> Research Paper
>> Argumentation

* SYNTHESIS
>> Comprehensive Exam
>> Case Studies/Simulations
>> Research Paper

* EVALUATION
>> Group Presentation Evaluation
>> Strategic Evaluation and Recommendations
>> Portfolio

ATTITUDES ASSESSMENT

* ETHICS/SOCIAL RESPONSIBILITY
>> Case Studies
>> Class Discussion

* SELF CONFIDENCE
>> Argumentation--Ability to State and Justify Position Effectively
>> Knowledge of Models Which Become Tools of Analysis

* SELF ASSESSMENT
>> Portfolio

CAPSTONE EXPERIENCE--PHILOSOPHY AND RELIGION

SENIOR SEMINAR

    * TEAM TAUGHT

    * 3 CREDIT COURSE

    * STUDENTS WRITE AND PUBLICLY DEFEND A SENIOR THESIS

KNOWLEDGE ASSESSMENT

    * DISCIPLINARY AND INTERDISCIPLINARY CONTENT, INTEGRATION AND ASSESSMENT
        Thesis Developed Over Stages
        Graded Class Participation
        Graded Short written Assignments
        Public Oral Examination With Qualified External Examiner and Thesis Committees

SKILLS ASSESSMENT

    * WRITING
        Senior Thesis Developed Over Stages
        1. Prospectus and Annotated Bibliography
        2. Conspectus and Selected Passages
        3. Full Draft (25-60 pages)
        4. 10 Page Abstract
        5. Final Draft After Oral Defense

    *SPEAKING
        Discussion
        Presentation of Prospectus
        Presentation of Conspectus
        Oral Defense With External Examiner

    *COLLABORATING
        Written Questions and Comments on Other Students' Projects
        Discussion of Other Students' Projects

CRITICAL THINKING SKILLS

    * COMPREHENSION AND APPLICATION
        Research for Writing Thesis
        Comprehensive Oral Examination

    * ANALYSIS
        Analyzing Key Primary and Secondary Sources for Thesis Research
        Analyzing Couterarguments to the Student's Own Arguments

* EVALUATION
>   Evaluation of Sources for Thesis
>   Written Critiques of Other Students' Work
>   Evaluation of Merit of Other Students' Critiques of Own Work

*SYNTHESIS
>   Writing of Thesis
>   "Debriefing"

ATTITUDES ASSESSMENT

* INFORMED OPENNESS TO MORE THAN ONE POSITION
>   Nature of Research in the Discipline
>   Collegial Discussion in the Seminar
>   Thoughtfulness in Written Critiques

* REFLECTIVE EVALUATION OF SELF
>   Discussions With Thesis Advisor
>   Consideration of External Examiners Report
>   Final Round—"Debriefing"

*EVALUATION OF UNIVERSITY AND MAJOR
>   Final Round of Presentations
>   Course Evaluation
>   Written Reports of the External Examiners

CAPSTONE EXPERIENCE--MATHEMATICS

A mathematics major fulfills the capstone experience by completing a project which demonstrates his or her ability to study independently some area of mathematics, and to communicate, orally and in writing, the knowledge so obtained.

THE MECHANISM

Each student will be responsible for choosing a project and a supervisor. If the supervisor approves, the student proposes (in writing) this project to the Undergraduate Committee. The Undergraduate Committee will then decide if the project is appropriate.

At the completion of the project, the student, with the approval of the supervisor, presents the final written report to the Undergraduate Committee, which decides whether the report is adequate. If so, the supervisor makes arrangements for the public presentation. At the completion of this presentation, the student will have completed his or her capstone experience and met the graduation requirement.

THE PROJECT

Many different types of projects will be considered acceptable. They should satisfy three criteria.

(1) The student should learn some mathematics outside the classroom setting.
(2) The student should synthesize material obtained from different sources.
(3) The student should clearly communicate, orally and in writing, what he or she has learned.

Acceptable kinds of projects:

The student may undertake research in collaboration with a faculty member.
The project may be further study of an area of interest to the student.
For example, someone interested in combinatorics could study, and report on, design theory.
The project might be an application, new or old, of mathematics. For example, the student could learn about the application of linear algebra to Markov chains.
The student could base his or her report on an article in the Mathematical Monthly.

Unacceptable kinds of projects:

An unadorned computer program would be unacceptable. A nontrivial program, in conjunction with a paper explaining the mathematics involved, might, however, be acceptable.
A summary of an article, or a book report, might be inadequate. As state above, the student should synthesize material from different sources. The project certainly could be based on a single article or book, but at the very least, the material should be placed in an appropriate context.
A report on the history of some mathematics might or might not be acceptable. One of the criteria above is that the student learn some mathematics (not just history). A history that demonstrates the student's mastery of the mathematical issues involved would, however, be good.

ROLES OF STUDENT, SUPERVISOR, AND UNDERGRADUATE COMMITTEE

The student is responsible for finding a supervisor and a project, for getting the necessary approvals from the Undergraduate Committee, and, of course, for completing the project.
The supervisor's role is primarily to provide guidance. He or she may help in the choice of project (e.g. by suggesting articles to consider), and may need to provide encouragement or suggestions at difficult moments. It is not intended that the supervisor should actually choose the project, or ride hard on the student. The amount of assistance needed will naturally vary, but the project is the student's not the supervisor's. The supervisor will, however, have to approve the student's work before it is taken to the Undergraduate Committee.
The Undergraduate Committee's role is mainly to ensure that projects are appropriate. It is their job to disapprove of projects that do not meet the specified criteria. They should not be expected to check papers for accuracy.

FINAL COMMENTS

The final paper should be submitted to the Undergraduate Committee *in the semester before graduation*. The accompanying schedule gives more detail. The main point here is that the student should complete his or her project in the first term of the senior year at the latest.
The public presentations should be 25-30 minutes in length. Of course, the paper will be more extensive.
The paper must adhere to the usual standards of style and format. It must be typed, and it must contain a proper list of references.

Projects undertaken for other purposes could be used for this as well. (Projects undertaken for a class may serve as a basis, but must be considerably extended.) The paper and public presentations will, however, still be needed.

An outstanding project might also satisfy the honors requirement.

Faculty in other disciplines may serve as supervisors.

DEADLINES FOR CAPSTONE PROJECTS

The student should choose a supervisor as early as possible in the term *before* graduation, i.e. the first term of the senior year. The student and the supervisor then agree on a project, and the student writes a proposal, outlining the project. This proposal is submitted to the Undergraduate Committee.

After the Undergraduate Committee approves the project, the student does it, and writes a paper and submits it for approval.

After papers are approved, the Undergraduate Committee coordinates the scheduling of public presentations. These will normally be given during the semester in which the student graduates. The supervisor will make the arrangements for the presentation.

Deadlines for Spring and Summer Graduation:

By midterm, Fall semester	Submit written proposal
By the last day of Fall semester classes	Submit final paper
By the last day of Spring semester classes	Give presentation

Deadlines for Fall Graduation:

By midterm, Spring semester	Submit written proposal
By the last day of Spring semester classes	Submit final paper
By the last day of Fall semester classes	Give presentation

Guidelines for Proposal:

Keep it simple. No more than one page is necessary.
References are required.
The proposal must be typed.
The supervisor's signature is necessary.

CAPSTONE EXPERIENCE--ENGLISH

SENIOR SEMINAR

* TAUGHT BY INDIVIDUAL PROFESSORS
* FOUR CREDIT COURSE

English 498. Senior Seminar. 4 hours.

The purpose of the course is to offer a forum for senior English majors to examine their progress toward an English major, determine directions for future studies in the major, and share new studies.

TYPES OF EXPERIENCES

One example of an English capstone experience for four semester of seniors required student self-assessment through reflective journal entries and through design and submission of the LAS portfolio, collaborative seminar presentations of research, and individual "personal best" projects presented in public fora beyond the seminar. Knowledge and skills assessment are reflected in the seminar activities.

METHODS OF CONDUCTING SEMINAR

Seniors reviewed and strengthened their knowledge of disciplinary content areas in discussions of language, literature, and literacy issues, through the discussion of the formation of literary canons and application of critical perspectives to canonical and non-canonical works, and by writing two "meditations" on languages and a self-portrait as an "English major." They demonstrated their abilities in making interdisciplinary connections through their research and presentations and through their review and selection of material for the portfolio.

They demonstrated writing skills in the production and revision of statements of personal philosophy for graduate school applications, letters of application to graduate study or employers, résumés and *curricula vitae*. They demonstrated speaking skills in extemporaneous seminar discussions, in formal, collaborative seminar presentations, and in public presentations in public fora outside the seminar. Self-assessment protocols assisted the students in evaluating their performance in the formal speaking activities. They also reflected on their collaborative skills through the self-assessment protocols.

CONCLUSION

The English faculty have redesigned the capstone course so that it provide seniors with more opportunity for integrating their studies in five strands of the major and more opportunities for interdisciplinary and collaborative capstone projects.