

The Capstone Course: Innovative Concepts and Content

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The purpose of this article is to provide new concepts, a rationale, and a framework for developing an innovative working model for an institution-wide capstone course. Often used as a culminating experience for curricula across academic programs in higher education, the capstone course involves structuring academic exercises that challenge higher order thinking skills and provide a platform for students to demonstrate mastery and achievement within a discipline. This definition can be broadened to evaluate the impact that liberal arts core courses have on students, and the impact of courses within the major on a student's professional development.

Reform strategies for capstone experiences should properly integrate institutional mission and service learning, and develop collaboration between students, faculty, and professionals within a discipline. Marden-Lokken said that the capstone experience included building a foundation in ethics as part of the general education curriculum (personal communication, December 12, 2003).

Whether seeking efficiency or effectiveness, many colleges and universities identify the quality of instruction and student learning as priorities shaping faculty commitment to curricular change (Ferren & Slavings, 2000). Not surprisingly, institutional cost control measures can counter efforts to restructure curriculum simply by drawing away resources from curricula to focus on cost control of facility expenditures, personnel, and programming. Reform strategies of the magnitude of curriculum restructuring must address both.

Embracing this challenge, Alvernia College embarked on a curriculum restructuring action plan and, in so doing, provided tangible evidence that the college's academic programs were effective and met the demands of the public as well as the demands of accrediting agencies. This plan undertook a revision of the college's core curriculum, creating options for students to explore some subjects in depth while maintaining the requirement to gain awareness of broad areas of study in the arts and sciences. Students completing the core curriculum were expected to develop facility in oral and written communication, rudimentary quantitative skills, and critical thinking ability. The centerpiece of the core—theology and philosophy—was maintained.

A committee of administrators and faculty members met to deliberate the merits of the capstone course and to understand the role that the capstone course served within each department. As a member of the Association of American Colleges & Universities

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(AAC&U), Alvernia College committed time, money, and personnel to collaborate with other member institutions that embraced AAC&U's Statement on Liberal Learning (1998):

The ability to think, to learn, and to express oneself both rigorously and creatively, the capacity to understand ideas and issues in context, the commitment to live in society, and the yearning for truth are fundamental features of our humanity. In centering education upon these qualities, liberal learning is society's best investment in our shared future.

Fully committed to the goals and objectives outlined by AAC&U's Greater Expectations Initiative (2002) ("building coherent, purposeful programs that lead to higher levels of achievement for all students"), this case study approach introduced a plan for curricular innovation with attention focused on the capstone experience. As part of the discussion, the strategic model and action plan used a PERT diagram to disclose the necessary steps and timeline for undertaking capstone course development and reform.

Literature Review

A 1996 report, *Shaping the Future: New Expectations for Undergraduate Education in Science, Mathematics, Engineering, and Technology*, prepared under the direction of the National Science Foundation and designed primarily to review undergraduate education in the areas of science, mathematics, engineering, and technology in America, has had great influence in helping to bring about institutional and educational reforms in United States colleges and universities ("Guide," n.d.). The initial purpose of the review was to consider the needs of all undergraduates attending types of U.S. two- and four-year colleges and universities.

Why make any changes or institute any reforms within higher education? The *Shaping the Future* report (1996) makes the following arguments:

1. As K-12 education changes as a result not only of new state standards but also because of a new emphasis on inquiry and active learning, and increased uses of technology, students will enter undergraduate institutions with new expectations, increasing the pressure for reform at this level.
2. Too many college graduates enter the workforce ill-prepared to solve real problems in a cooperative way, and lacking the skills and motivation to continue learning.
3. As colleges and universities struggle with college reform issues, the world continues to change. Knowledge expands, new fields develop, other nations improve their educational systems, and new needs emerge. These changes create a need for governmental agencies at all levels—business, industry, professional communities, and colleges and universities—to work together with a sense of urgency to make the necessary improvements.

If the above statements are true, what do college students need to learn to survive in a complex and interdependent world? According to *Greater Expectations: A New Vision for Learning as a Nation Goes to College* (2002), the list is as follows:

1. **Intellectual and Practical Skills:** Students need skills that are extensive, sophisticated, and expand with new technologies. As they progress through grades K-12 and the undergraduate years at successively more challenging levels, students should learn to:
 - a. communicate effectively orally, visually, in writing, and in a second language;
 - b. understand and employ quantitative and qualitative analysis to solve problems;
 - c. interpret and evaluate information from a variety of sources;
 - d. understand and work with complex systems and with diverse groups;
 - e. demonstrate intellectual agility and the ability to manage change;
 - f. transform information into knowledge, and knowledge into judgment and action.
2. **Knowledge of Human Culture and the Natural World:** While intellectual and practical skills are essential, so is a deeper understanding of the world students inherit. This knowledge extends beyond core concepts to include ways of investigating human society and the natural world. Both in K-12 education and in college, students should have sustained opportunities to learn about:
 - a. human imagination, expression, and the products of many cultures;
 - b. interrelations within and among global and cross-cultural communities;
 - c. means and modeling the natural, social, and technical worlds;
 - d. values and histories underlying U.S. democracy.
3. **Individual and Societal Responsibility:** A democratic society depends on its citizens' sense of social responsibility and ethical judgment. To develop these qualities, education should foster:
 - a. intellectual honesty;
 - b. responsibility for society's moral health and for social justice;
 - c. active participation as a citizen of a diverse democracy;
 - d. discernment of the ethical consequences of decisions and actions;
 - e. deep understanding of one's self and respect for the complex identities of others, their histories, and their cultures.

In an increasingly technical and competitive world using information as its common currency, a society without a properly educated citizenry will be at great risk and its people denied the opportunity for a fulfilling life ("Shaping the Future," 1996).

In his first address to the faculty in 1998, President Lawrence Mazzeno of Alvernia College issued the challenge, "Change or Die," as a way of focusing faculty attention on what needed to be done to position the college as a viable institution in the world of higher education.

The change process often meets with resistance and must be nurtured over time. The change cycle has the following components:

1. **External Enabling Conditions:** Enabling conditions (if they exist) indicate that the environment will be supportive of cultural change. Such conditions are in the external environment and impact the organization. In a school setting, examples include scarcity or abundance of students, and stability or instability of the external environment.
2. **Internal Permitting Conditions:** To increase the likelihood of organizational culture change, four internal permitting conditions must exist:
 - a. a surplus of change resources (e.g., managerial time and energy, financial resources) that are available to the system beyond those needed for normal operation;
 - b. system readiness (e.g., willingness of most members to live with the anxiety that comes with anticipated uncertainty that is characteristic of change);
 - c. minimal coupling (e.g., coordination and integration of system components);
 - d. change-agent power and leadership (e.g., the ability of administrators to envision alternative organizational futures).
3. **Precipitating Pressures:** Four factors that precipitate organizational culture change include:
 - a. atypical performance;
 - b. pressure exerted by stakeholders;
 - c. organizational growth or decrease in size, membership, heterogeneity, or structural complexity;
 - d. real or perceived crises associated with environmental uncertainty.
4. **Triggering Events:** Culture change usually begins in response to one or more triggering events:
 - a. environmental calamities or opportunities such as natural disasters, economic recession, innovations, or the discovery of new markets;
 - b. managerial crises such as a major shake-up of top administration, or a foolish expenditure;
 - c. external revolution such as mandated desegregation or Title IX;
 - d. internal revolution such as the installation of a new administrative team within the organization.
5. **Cultural Visioning:** Creating a vision of a new, more preferred organizational culture is a necessary step toward that culture's formation.
6. **Cultural Change Strategy:** Once a new culture vision exists, an organization needs a strategy to achieve that culture. Such a strategy outlines the general process of transforming the present culture into the new one.
7. **Culture Change Action Plans:** A series of explicit action plans for the inducement, management, and stabilization of change make a change strategy known.

8. **Implementation of Interventions:** An organization selects culture change interventions based on the ecology of a particular organization for each action plan phase and the change agent's competencies in implementing them.
9. **Reformulation of Culture:** When implemented, the intervention plans result in a reformulated culture (Lunenburg & Ornstein, 2000).

Capstone activities should be explored as new ways for colleges and universities to assess and evaluate the success of their programs as students leave the campus. At Alvernia College, the goal associated with the capstone program is to see what impact the "core courses" have had on the student, how successful the courses were in his/her major in preparing the student for the world of work, and how well the combination of the core and a student's major have blended together in the college's attempt to deliver on the promise of its mission, "Skills for the Workplace, Values for Life."

Descriptive models of capstone projects are numerous and each is unique. Examples of two institutions which underwent capstone reform are Western Michigan University and Indiana University-Purdue University, Indianapolis (IUPUI). At Western Michigan University, a major research project focused on the capstone in the master of arts program in socio-cultural studies. The goal was a capstone activity guaranteeing students, at the completion of their coursework, the ability to put together a project that would reflect a synthesis of skills and knowledge from a concentration of their core courses while at the same time illustrating a practical application of this newly gained knowledge ("Capstone Info," 2004). Similarly, IUPUI espoused a working definition of the capstone experience as "a culminating set of experiences that captivate, encapsulate, synthesize, and demonstrate learning" (Hamilton, 2002).

Defining the purpose of the capstone experience, identifying the keys to successful models, generating options for model flexibility, and determining preferred pedagogical practices are the components of the process of capstone innovation.

Discussion

The goal of the Alvernia study of capstone course reform was to improve the quality of education in order to graduate better prepared students for the working world. At the same time, capstone courses provide an opportunity for colleges and universities to reinforce their educational missions, values, community goals, ethical concerns, and social responsibility. J. Kinzie (personal communication, January 16, 2004) reported that the value of the capstone experience is its effort to enhance student socialization and its focus on critical thinking skills and worthy applications in academic and professional settings. Of equal significance is the meshing of institutional objectives with the objectives set forth by accrediting agencies, and perhaps as important, meshing objectives with those set forth by professional associations and organizations working cooperatively with academia.

The significance of curriculum restructuring for accreditation purposes is a view adopted by administrators as part of a comprehensive effort to meet or exceed

accreditation standards. From this perspective, the Offices of the President and the Provost would initiate several charges to standing or created committees to adopt new measures and programs to achieve the strategic goals established for academic programs that comply with accreditation standards. These strategic goals exist within an institution's overall strategic plan and may be clearly aligned within the institution's self-study process for accreditation. In Alvernia's case, the capstone course developed in this manner, as did subcommittees on mission integration, moral leadership, program partnerships between arts and sciences and the professional programs, and core competency assessment.

From the viewpoint of professional agencies with deliberate agendas of improving the liberal education component, the most profound efforts to date reflect the partnership among the following research associations: The Association of American Colleges and Universities, The Center for Postsecondary Research and Planning at IUPUI, The American Association for Higher Education, The Center of Inquiry in the Liberal Arts at Wabash College, and The Lumina Foundation for Education. Research is currently underway by the National Survey of Student Engagement (NSSE) and the Project Documenting Effective Educational Practice (DEEP); both projects address the importance of the capstone course as a powerful integrating component within a student's education.

Driving these educational reform initiatives is the creation of outcomes assessment measures for academic programs and support services that document effective and efficient programs. Revitalizing undergraduate education will take pace-setting reforms "to help college students become intentional learners who can adapt to new environments, integrate knowledge from different sources, and continue learning throughout their lives" ("Greater," 2002, p. xi).

With a new administration introduced at Alvernia College in 1997, there was an expressed desire on the part of some faculty to revise the college's core curriculum. Curricular reform began in 1998 with faculty efforts to revise the core to allow students an in-depth subject focus along with an awareness of the broad areas of study in the arts and sciences. This joint administrative and faculty initiative sought dramatic expansion with conference affiliation and team participation with AAC&U since 2001. Faculty and administrative teams submitted proposals to AAC&U on general education and the freshman experience.

Several thinkgroups arose to investigate the direction on certain campus issues. One such think group ("Endings") immediately began exploring the existence and design of capstone experiences on campus. The capstone experience team was formed in 2003 and began work to convince faculty colleagues of the possibility of creating a single capstone experience, or series of experiences, that would allow students to demonstrate mastery of their disciplinary major through higher-order skills along with a concomitant understanding of Alvernia College's core values.

A capstone experience team of five persons was assembled and included three members of the faculty, the director of institutional research, and the president of the college. The group clarified its purpose and agenda prior to attending the 2003 AAC&U

Greater Expectations Conference. AAC&U staff and resources proved invaluable in formulating an action plan to proceed with reforming the capstone. The conference also provided opportunities to discuss the capstone experience with representatives from other schools, who offered opinions and examples of capstone courses within many of their own majors.

Upon returning to Alvernia, the capstone experience team established an agenda for further capstone reform. A statement of purpose and criteria explaining the motive of reform was drafted by this group and presented to the faculty assembly in fall 2003. The capstone team met with faculty of other departments and provided further explanation of the reform project. In these meetings, two departments volunteered their programs to be reviewed by the capstone team and to consider modifications and efforts to implement initiatives outlined in the statement of purpose and criteria.

During the 2004 spring semester, the Departments of Social Work and Psychology undertook an internal examination of their capstone courses and met with the capstone team to discuss methods of revising the existing design to meet outlined initiatives developed from the 2003 AAC&U conference. The departments first evaluated the effectiveness of their senior capstone courses. Initiatives include:

- an overall assessment of seniors' knowledge and academic skills within their major discipline as well as the general education requirements (e.g., a summative exit examination experience);
- a presentation of the capstone experience (e.g., Senior Scholarship Symposium);
- a capstone summit featuring competitive business world case studies (Rienzi, 2003);
- a performance task forum for student demonstration of applied analytical skills and knowledge to novel tasks;
- a senior status portfolio documentation of practical/clinical and applied knowledge and skills in work settings;
- pre- and post-measures of varied forms of liberal learning between freshman and senior students (Schneider, 2002);
- department-specific plans to foster student engagement (Young, 2003), beginning with recruitment efforts and continuing through job placement.

The Psychology and Social Work Departments were charged with examining their current capstone experience and discussing with students and the capstone team new initiatives that might further develop. Future initiatives are outlined below:

Institutional level:

1. Develop an institutional identity focused on defining what a distinctive education means prior to the capstone experience, and how the program, service, and delivery method comprise a distinctive education;
2. Conduct organizational retreats for the development and synthesis of a broad-based, institution-wide capstone experience as part of the university strategic plan;

3. Develop a plan and timetable to review and assess the capstone requirements;
4. Establish a standard within the Office of Institutional Research to document the merits of the capstone experience as a compliance factor within the accreditation self-study process;
5. Establish institutional benchmarks and performance indicators for the continuing analysis, refinement, and submission of data for assessing capstone contribution;
6. Explore strategic ideas and plans to further integrate the capstone and achieve consistency and synergy across all strategic planning initiatives;
7. Partner with local businesses to bring real-world tasks to the capstone experience and include business professionals in the evaluation of work;
8. Incorporate the identify features of the capstone into institutional marketing material and Web site presence.

Department level:

1. Establish as a basis of the capstone experience an indoctrination schedule of construction features that include oral and written communication, qualitative and quantitative research methods, technological literacy, ethical and values-based assignments, need-based institutional service, need-based community service, need-based service to the profession, cultural diversity experiences, presentation skills, time-management skills, self-discipline, personal health and wellness management, resourcefulness, creativity, perseverance, personal development-social skills, and professional identity development-mastery skills of disciplinary major;
2. Facilitate a portfolio construction congruent with curriculum measures for each class year;
3. Incorporate a class graduation scheme using a capstone class-level measure to create continuity throughout the student's 4-year academic experience;
4. Develop a class-level survey to assess capstone integration by students;
5. Include a component within each course evaluation to address capstone relevance and achievements;
6. Construct syllabi with capstone requisites and measures of relevance;
7. Incorporate pre- and post-capstone measures of relevance within each course;
8. Develop a working-world connection that parallels class measures and requires an off-campus agency to have input to the capstone experience;
9. Construct a valid and reliable assessment rubric across various departments and majors;
10. Create a competitive climate and framework for capstone recognition and weight.

Learning across the curriculum is positively impacted by student exposure to, and application of, active learning and the development of a metacognitive approach (Bransford, Brown, & Cocking, 2000) in K-12 teaching practices. It may be necessary to

assess these levels of exposure as part of freshman orientation to accompany pace-setting reform in the college curriculum.

Conclusion

Over the past several years, the Capstone Thinkgroup Team has researched and deliberated on capstone integration in the Alvernia curriculum. Together, college administrators, department faculty, and curriculum committee members continue to refine the capstone project for each program that produces graduating seniors. Department examples include the following:

NURSING: Students must complete NUR 409 Leadership and Ethical Dimensions for Nursing Practice (3 credits). This is taken concurrently with NUR 417 Nursing Role Synthesis Practicum (6 credits). This includes a 15-hour practicum as well as class work.

COMMUNICATIONS: Students must take either COM 480 Research Seminar (3 credits) (30+ page paper or a creative project, i.e., a play) or COM 481 Internship (credits vary) (complete required hours, keep a log, assemble a portfolio, and write a 15-30 page paper).

EDUCATION: Students must complete ED 402 Professional Seminar (3 credits) (30+ hours of in-classroom experience, in addition to a research paper reflecting on how their coursework in the area of ethics and values carries over into their classroom). In addition, each student must also take ED 405 Student Teaching Seminar (2 credits) (portfolio development), and ED 420 Student Teaching (10 credits).

PSYCHOLOGY: The Capstone Experience is a two-pronged approach comprised of four courses totaling 10 credits. Students must take PSY 320 Research Methods (3 credits), PSY Senior Seminar (3 credits), PSY 413 Practicum II (2 credits) (100 hours field site) and PSY 423 Practicum II Seminar (2 credits) (journal, group presentation, and 10+ page detailed evaluation of the practicum experience).

SOCIAL WORK: Students must take several courses that work together to fulfill the Capstone Experience. SW 404 Field Practicum IV (4 credits, 200 hours) and SW 405 Methods of Social Research (3 credits) in which students are to complete a research project and present orally to class.

These departments have instituted or are working on similar type programs that include more than one course in the Capstone Experience. In the academic community, the implicit discussions about, and references to, capstone courses commonly address the efforts of many departments to determine the right ‘fit’ for each major. However, at present, the explicit use of the wording “capstone” has not been approved for use in the undergraduate catalog for any major.

The Capstone Thinkgroup Team created the action plan and timeline presented in the article, facilitated the development of two pilot capstone programs (in Psychology and Social Work), and deliberated at regularly scheduled meetings with department chairs and the curriculum committee. The team continues to promote three key reasons for implementing a capstone experience: 1) to serve as an important measure for outcomes assessment for curricular consistency/Middle States review; 2) to reinforce academic integrity of each major and the college as a whole; and 3) to provide for a measure of “mission integration” into the existing curriculum. The following recommendations have been forwarded to the Provost’s Office as capstone integration proceeds:

- further discuss and explore how the capstone projects may affect the college core;
- establish a faculty ad hoc committee with the purpose and authority to:
 1. review the research gathered by the Capstone Thinkgroup, the action plan/pilot programs, and workable timeline for capstone integration throughout all disciplines,
 2. require capstone criteria and assessment in program reviews,
 3. create college catalog descriptions,
 4. construct departmental criteria in a timely fashion to meet the charge of the Middle States Review report, which states:
“Develop a student learning assessment plan (discipline specific) that articulates an evaluation infrastructure that is clear, measurable, performance-based, program-specific, and that meets educational objectives and related proficiency standards and methods of assessment appropriate to the objectives...”

Measuring the effectiveness by which each department promotes the mission of the college, “Skills for the Workplace, Values for Life,” is inherent in this task of capstone integration. Recently, the Education Department administered three DIT-2 (Defining Issues Test) developed at the University of Minnesota Center for the Study of Ethical Development as a pilot study to measure the “Values for Life” concept. This is an example of how departments across campus have accepted this challenge and embraced innovative concepts and content.

Authors’ note: Interested parties seeking updated information regarding Capstone integration in the Alvernia curriculum are directed to contact faculty liaison, Carrie Fitzpatrick, Department of English, Alvernia College.

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