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Agribusiness Capstone Courses Design: Objectives and Strategies

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Abstract

This paper discusses the benefits of using strategic management principles as the cornerstone for building the agribusiness capstone experience. The necessity for agribusiness firms to create and implement strategies that build a sustainable competitive advantage in turn necessitates the development of strategic management skills in the leaders/managers of the future. As such, the objectives of a capstone course lean heavily toward the integrative development of strategic decision-making competence. This has a number of implications for the capstone professor in terms of course content, pedagogies, and subsequent measurement of student performance.

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1.0 Introduction

In the past decade, many departments of Agricultural Economics either initiated agribusiness degree programs or substantially changed traditional academic programs to better meet the needs of students and the agribusiness industry (French, 1985). These developments in undergraduate agribusiness academic programs have usually included or fostered a more formalized relationship with colleges of business (Litzenberg, Gorman, and Schneider, 1983). General business courses such as accounting, corporate finance, organizational behavior, and marketing provide the theory for operational decision-making and have long been included in business school curricula. While these and other "tools" courses are essential in an agribusiness program, the need to bring together the subject matter from various courses in a meaningful manner and to enhance decision-making capabilities of students has dictated the need for capstone courses.

Discussions among those involved in the design and teaching of agribusiness capstone courses reveal core commonalties in overall purpose and even specific objectives. However, considerable differences exist in the content and strategies utilized to achieve course objectives. There is also a shared sense of frustration and concern as to whether an optimal capstone "experience" is being realized.

Capstone course objectives are wide-ranging, but generally include: (1) integrating functional knowledge from previous courses in management, marketing, operations, finance, human resource management, and sales; (2) applying acquired knowledge to management problems emanating from the firm's internal and external environment; (3) improving written and oral communication skills; and (4) developing teamworking skills in diverse and cross-functional situations (Bond, 1995; Rhodus and Hoskins, 1995). The importance of ethical principles, personal and company values, and socially responsible management practices are also highlighted (Hall, 2000; Baker, 2000; Kepner, Fairchild, and Taylor, 2000).

Faculty teaching capstone courses often find themselves serving as *facilitators* of learning in these courses with the goal of helping students make the transition from a state of being dependent learners to the state of being self-directed learners. As such, students are coached (and coaxed) to bridge the gap between the well-structured learning environment of the traditional college classroom and the dynamic agribusiness environment, which puts a premium on motivation, initiative, and creativity. Industry feedback obtained by the authors indicates that students who have completed capstone courses require less on-the-job training than those without a capstone experience. This may stem from their ability to look across diverse production, processing, and distribution sectors of the food chain and think strategically about how actions (and subsequent reactions) in one sector affect other sectors.

Conversely, there are many frustrations inherent in teaching capstone courses, as they tend not to involve static situations with static pedagogy. As the mix and content of agribusiness foundation courses continue to change, so does the success of various strategies used in capstone courses. Depending upon the composition of each class, previously successful approaches may fail to meet objectives, creating a need to be flexible and build "on-the-fly" components into the course. Thus, capstone course facilitators must continuously change and fine-tune course content in order to provide an optimal capstone experience that prepares students to compete successfully in the high-pressure world of agribusiness.

Capstone courses in agribusiness offer unique challenges and opportunities. The purpose of this paper is to provide insight into the design and execution of the capstone experience based on the collective experiences of the authors, who together have 34 years of combined experience in teaching agribusiness capstone courses. The paper is organized as follows. The following section reviews the "what and why" of capstone courses; the third section addresses the various components of capstone courses; section four considers pedagogical dilemmas in teaching capstone courses; section five examines the issue of measuring student performance; section six describes the transitioning process from traditional teaching styles to "facilitating" styles of instruction; and the final section considers implications for faculty involved in the capstone experience.

2.0 The What and Why of Capstone

Allen (1992) has outlined the challenges that influence agribusiness curriculum design and instructional methodologies. As a precursor, he notes that (relative to past decades): (1) few people in society understand agriculture; (2) many students have no previous agricultural experience; and (3) producers, processors and distributors are becoming more sophisticated. He further acknowledges that human-resource issues are becoming increasingly important and that an international dimension must be integrated into our curricula. The ultimate challenge for faculty lies in deciding how to best undertake teaching in this new environment.

In addition to these broad-based challenges, surveys of agricultural and agribusiness employers consistently identify a set of skills and qualities demanded of agricultural college graduates (Litzenberg and Schneider, 1987). These include leadership, oral and written communication skills, the ability to work in teams and with people from diverse backgrounds and cross-functional areas, and critical thinking and problem-solving skills. Employers also seek students who have knowledge of current issues and problems, as well as a global perspective on competition and cultures. Traits such as motivation, appreciation for interdependencies, ability to relate to non-agriculturalists, management skills, and computer literacy are also important.

Crunkilton, Cepica, and Fluke (1997), developed a comprehensive reference document on implementing capstone courses in colleges of agriculture, based on a three-year USDA-sponsored project. A national survey of colleges of agriculture was undertaken to identify teaching practices, expected learning outcomes, and suggested learning activities. Their research builds on earlier work by agricultural and agribusiness economists such as Litzenberg, et al., French and Erven (1985), and Westgren and Litzenberg.

After reviewing the literature, surveying colleges of agriculture with respect to the use of capstone courses and teaching practices, and examining syllabi, Crunkilton, et al. defined a capstone course as:

> *"...a planned learning experience requiring students to synthesize previously learned subject matter content and to integrate new information into their knowledge base for solving simulated or real world problems."*

They note that a capstone course should focus on a complete integration of fragmented disciplinary knowledge, facilitating a meaningful closure to students' academic experiences. Moreover, it should provide students with a rich contextual framework that connects theory and application based on their academic experiences and an increased awareness of their interconnection. A capstone course should serve as both a synthesis and as a bridge. Thus, ideally, a capstone course should be scheduled in the last term of a student's program, easing the transition between academic experiences and entry into a career or further study.

In order for a capstone course to successfully integrate subject matter, synthesize previously acquired knowledge and prepare students for their careers, it must contain certain key elements. These include expected course educational outcomes; required learning activities; optional learning activities; and responsibilities of the instructor (Crunkleton et al.). These are outlined in Table 1, in addition to elements found to be a hindrance to the learning process.

It is clear that capstone courses are critical to the agribusiness student's learning experience, whether at the undergraduate or graduate level. It is also clear that, for a capstone course to achieve the desired outcome, learning activities must be designed, coordinated, and facilitated in ways that differ (often substantially) from most other courses in the agribusiness curriculum. This presents interesting challenges for both students and course facilitators.

3.0 Components of Capstone Courses in Agribusiness Curricula

It can be argued that capstone courses in agribusiness curricula must include three components in addition to those discussed in the previous section. First, the capstone course must include significant experience in applied decision making.

Table 1. Attributes of capstone courses: educational outcomes, assorted learning activities, instructor responsibilities, and elements hindering learning success.

Expected Course Educational Outcomes	Required Learning Activities	Optional Learning Activities	Responsibilities of the Instructor	Elements Hindering Learning Success
▪ Problem-solving ▪ Decision-making abilities ▪ Capacity for critical thinking ▪ Ability to develop of collaborative and professional relationships ▪ Oral and written communication ▪ Prepare students for careers ▪ Improve awareness of complex relationships between societies, cultures, and businesses ▪ Facilitate transition from college to the workplace	▪ Projects, case studies, or issue analyses ▪ Small group work including 3-5 students undertaking an assignment or term paper ▪ In-class oral communication activities ▪ Intensive writing assignments ▪ Introduction of industry representatives to students in a planned learning environment	▪ Critiques of guest speakers, oral presentations, student papers, professional articles, or current events and issues ▪ Keeping journals or log books ▪ Individual projects ▪ Large group assignments, projects, issue analysis, or case study ▪ Field trips	▪ Assigning large term-long projects, case studies, and issue analyses ▪ Requiring intensive writing and speaking ▪ Including department faculty in course formation and teaching ▪ Using critical thinking to solve real-world problems ▪ Holding open class discussion ▪ Involving guest speakers ▪ Conducting field trips ▪ Team teaching selected topics or the entire course ▪ Using faculty peer evaluations ▪ Inviting student feedback ▪ Ensure that students study and keep abreast of current events ▪ Using debates in class ▪ Presenting final project results to real clients or representatives from industry ▪ Establishing deadlines on course projects throughout the term	▪ Time constraints for both students and faculty ▪ Lack of student retention of material from previous courses ▪ Necessity to review basic principles ▪ Culture of formal lectures ▪ Varying levels of student experiences ▪ Inadequate funds to support needed learning activities which limit the effectiveness of capstone courses ▪ Need to motivate students ▪ Large class size ▪ Non-participatory learning experience on the part of students ▪ Student criticism which inhibits class discussion ▪ Too much emphasis on student memorization ▪ Lack of student writing and communication skills ▪ Difficulty lining up educational projects and activities ▪ Student procrastination ▪ Students requiring excessive direction instead of integrating and using what they already know

Source: Adapted from Crunkilton et al.

This most often requires the use of cases, formal presentations by individuals and groups, and even the integration of actual problems encountered by agribusiness firms. The ability to present one's recommendations as an output from team analysis should be a secondary objective of the course (see for example, the discussion of overt and covert teaching strategies in Westgren and Litzenberg).

Second, the capstone course must instill graduates with an ability to use economic theory to understand the behavior of agribusiness firms and develop recommendations for maximizing business performance. Instructors of capstone agribusiness courses must build on the principles of economic theory to show students how operational decisions make use of this theory.

Finally, capstone courses are the ideal place to introduce strategic management principles and discuss their role in decision-making in the agribusiness firm. To exclusively teach students to make operational decisions limits their career advancement and value to an agribusiness firm's decision-making team. Strategic management principles are well suited to serve as the cornerstone of a capstone course. Students are well served because knowledge of how agribusiness firms create and sustain competitive advantage is useful for their career development.

4.0 Pedagogical Dilemmas

Given that strategic management principles (with an emphasis on economic underpinnings) and the development of student capacities to think strategically are of critical importance in developing a successful agribusiness capstone course, the next question is how to accomplish this pedagogically? The minimal number of available materials written with agribusiness applications and targeted at agribusiness-oriented audiences exacerbates the difficult task of choosing text materials, case studies, and business simulations.

4.1 Textbook Issues

Currently, there are no strategic *agribusiness* management textbooks. Most of the available textbooks in strategic management emphasize the "process" of strategic management and use the process as a chapter-by-chapter outline (Thompson and Strickland, 1999; Collis and Montgomery, 1997; Comerford and Callaghan, 1999). However, few of these texts contain discussions of previously generated knowledge such as transaction cost economics, strategic commitment, and the resource-based view of the firm (Hirsch, 1988). While notable exceptions do exist (e.g. Hitt, Ireland, and Hoskisson, 1999; Barney, 1997), the real dilemma to date is that currently available texts lack the agribusiness focus that would be desirable. An alternative approach used by some capstone facilitators is to adopt the concepts-only version of these strategic management texts and supplement with handpicked or custom written cases (e.g. Harvard Business School cases).

Another pedagogical approach that some capstone professors have experimented with is to teach business strategy using microeconomics or managerial economics texts. Indeed, many of the recent texts do have a number of real-life examples to demonstrate the importance of economics in making managerial decisions. But this alternative is, at best, a compromise between traditional microeconomics and management strategy. In recent years, however, there have been a few texts that have helped teachers of capstone courses integrate these subject areas (e.g. Milgrom and Roberts, 1992; Oster, 1999; Besanko et al., 2000).

However, these texts tend to be more advanced than a typical undergraduate capstone course would require. Thus, the instructor is left with the decision of whether to: (a) use one of the traditional strategic management texts, (b) develop their own set of strategy-related course notes/readings incorporating economic underpinnings, or (c) a combination of (a) and (b). Regardless of the textbook option a professor chooses, the use of cases and/or business simulations is deemed to be an important supplementary contribution to the capstone experience.

4.2 Case Studies

The case method is useful in accomplishing all of the aforementioned primary capstone course objectives. To be most effective, cases should be chosen that force students to integrate and apply prior knowledge in the functional areas of management as well as create a strategic-management framework for their analyses. In most settings, students are expected to present and defend their findings either in formal class presentations, class discussions, or written analyses. Students should demonstrate their aptitude for clearly analyzing the problem, making well-supported recommendations, and clearly and concisely communicating the results of their analyses. The case method is an ideal format for applying strategic management tools because well-written cases can succinctly convey the large amount of information required to make decisions related to the strategic management of a firm.

Another form of case study experiential learning used by some capstone facilitators is service-learning projects in which students work closely with representatives from an actual company to develop a strategic analysis often referred to as a strategic audit. Company-specific data (regarding resources and capabilities) are analyzed in the context of the industry environment. Strategic options are outlined based on these internal and external analyses and implementations plans formulated. Feedback from students and participating company managers indicate that this experiential learning format is effective (Donaldson, 1995).

4.3 Issue Debates and Discussions

Issue debates and discussions are another effective tool for integrating previous coursework and applying those concepts to contemporary issues. These can be accomplished via facilitator-led class discussions or student-team issue debates. These two formats provide students the opportunity to consider a wide range of issues that influence business decisions including, but not limited to, domestic and international economic policies, regulatory and environmental issues, and ethical and human-resource concerns. Both students and course facilitators can choose issues for discussion. Current events reported in the business and general media, personal experiences, and management-oriented readings form the basis of issue discussions.

Facilitator-generated issue-discussions can be supported with reading assignments. Students are also encouraged to introduce management-related topics of particular interest gleaned from the news or business media or from other courses. Discussions can get quite heated particularly when the students and facilitator(s) strongly disagree with each other (real or staged).

The issue debates provide students the opportunity to investigate and articulate an issue, and then defend a position, which may be at odds with their personal view. An associated goal of the issue debate is improvement in oral communication skills. Suggested mechanics of the issue debates are as follows. Students are placed into teams of two or three and, for each assigned issue, one team takes a “pro” position and one team takes a “con” position. It is a good idea to randomly assign individual teams to a position on a randomly selected issue at least two-to-three weeks before each debate.

Issue debate expectations may include preparation of a position brief by each team , which defines the issue and outlines their position and arguments for in-class distribution prior to the debate. Facilitators then allow ten minutes for each team to state their position, followed by ten minutes for debate between the two opposing sides of the issue. About twenty minutes can be allotted for in-class discussion of the issue being debated. It is also a good idea for course facilitators to evaluate the performance and/or contribution of each debate-team member using an evaluation form. Evaluation criteria may include evidence of preparation, presentation quality and style, strength of rebuttal and answers to questions and evidence of teamwork. Student contributions during class discussion can be a key part of the class-participation grade.

On balance, issue debates are a generally positive exercise. They often generate interesting and sometimes even animated discussion. However, if not properly motivated, students will frequently demonstrate a lack of preparation, especially for

written position briefs. Debates also tend to lose focus of the central issues, requiring facilitators to interject and refocus the discussion. In large classes, they are time consuming and, as with any activity that is repeated multiple times in a term, tend to become a little stale, particularly as interest wanes late in the term.

The search for better and varied formats for utilizing issue debates continues. The authors' experiences suggest that the keys to successful debates rest in three areas. First, selection of issues for debate is critical. The process of engaging students to define topics seems to result in interesting topics that are often difficult to debate. An alternative to consider is the development of carefully considered issues by course facilitators. This ensures that issues are targeted and well-suited for debate. Second, expectations must be clearly communicated to students. Finally, facilitators must appropriately assign grades in order to send the desired signals to students regarding expected effort and performance.

Effectively utilizing issue debates and discussions remains challenging. The line between too much facilitator direction and allowing students to be responsible for their learning can be a fine one. However, the bottom line seems to be that debates and discussions of contemporary issues can contribute materially to the fulfillment of capstone course objectives.

4.4 Business Strategy Games/Simulations

Without a doubt, one of the most exciting capstone course pedagogues developed over the last decade is the competitive computer simulation. Simulations provide the opportunity for students to develop and implement a strategic business plan for a hypothetical firm and to evaluate the financial impact of the plan on the organization's success. An example of a popular simulation game is *The Business Strategy Game: A Global Industry Simulation* created by Thompson and Stappenbeck (1999).

The business strategy simulation requires the student "management team" to be responsible for a wide array business decisions associated with managing a moderately-sized company that has the potential to compete in a global market. Teams are evaluated on the basis of three criteria: a written and oral presentation of a strategic plan to a faculty "board of directors;" a written and oral presentation explaining firm and management performance, again to a board of directors; and the team's cumulative performance rating generated by the simulation program, based on sales revenues, earnings per share, return on equity, bond rating, stock price, and strategy.

Thompson and Stappenbeck note that the *Business Strategy Game* is a hands-on learning experience that provides valuable strategic and operating decision-making practice and helps students develop business judgment as they encounter an array

of business issues. Students face the need to continuously assess changing industry and competitive conditions, diagnose the strategies of competitors and anticipate their next moves, find ways to gain a competitive advantage, evaluate different courses of action, develop a strategic company plan, and adjust strategic plans in response to changing market and competitor conditions.

Students also gain a better understanding of how various operational or functional aspects of a business are integrative. The student management team has production plants to operate, labor to hire and reward, inventories to control, marketing strategies to execute, prices to set, accounting and cost data to examine, capital expenditure and investment decisions to make, shareholders to please, sales forecasts to estimate product demand, tariff, currency exchange rate, interest rate, stock and bond market, and demand fluctuations to consider.

The simulation is integrative of previous course material, solidifies strategic management concepts, and gives students insight into global competition. The game also improves student understanding of revenue-cost-price relationships. Management teams review operating statements, identifying costs that are out-of-line, compare profitability of different market segments, assess their company's financial condition, and decide on remedial and proactive actions (Thompson and Stappenbeck). Constructing alternative decisions and strategic plans using sensitivity analysis allows students to appreciate the value of number crunching and exploring multiple scenarios before pulling the trigger on a decision.

In sum, the business strategy simulation makes business decisions and their consequences a reality, seriously challenges students in a team-based competitive framework (often for the first time), brings everything they have learned in the curriculum together in a meaningful manner, creates new understanding from old material never before fully appreciated, and develops a deep and abiding understanding of the true meaning of competition. Our experience is clear; management team investment in time, focus, and commitment is highly correlated with success in the business strategy simulation. A secondary, but important benefit is that the game spurs students' competitive juices and makes learning fun.

5.0 Measuring Performance

Methods for measuring student performance in capstone courses may be best characterized as bipolar in nature. Either student performance has been measured in very qualitative or subjective manners by the capstone professor or a very legalistic approach has been taken to quantitatively arrive at a measure of student performance. The development of multiple choice test banks by textbook authors, teaching notes for cases (containing suggested questions and associated responses), and scoring systems for business simulations point to the trend towards more quantitative assessment mechanisms.

Capstone courses tend to be somewhat fluid, as professors often experiment with various combinations of strategy formulation, strategy implementation and functional decisions, in search of the optimal learning experience. Thus, the phenomenon of changing pedagogical combinations creates a dynamic element between years (and even between terms), which further exacerbates the student-performance measurement problem.

Performance assessment is also a challenge because of the non-traditional instructional methods utilized in capstone courses. Instructors who rely heavily on the lecture method for presenting class material will likely be satisfied with the traditional methods of performance assessment, including homework problems and examinations. However, traditional performance assessment methods are less effective at measuring student performance on case study analyses, business simulations, and term projects.

In some capstone courses, examinations have been abandoned as a means of assessing student performance. While examinations are useful in measuring some aspects of student learning in capstone courses, they do a poor job of measuring other important aspects. More importantly, eliminating examinations is a symbolic gesture that indicates that the course is not a typical course and that the expectations are more in line with what will be expected of the students as professional managers. The challenge is devising a highly subjective means of performance measurement that accurately measures students' contributions. It is particularly problematic when the deliverables are the result of a team effort.

Case study analyses are another example of material that is highly subjective in nature. Of course, this is not unique to the field of strategic management. Case studies in marketing, human resource management, and organizational management are also subjective in that answers may not be clearly right or wrong and multiple approaches to solving the problem might be appropriate. One approach to measuring performance under these conditions is to be very clear about what is expected. Content of case analyses should be judged on the soundness of

the students' recommendation(s), how well they have supported their recommendation(s), the appropriateness of the analytical tools they have selected, and the effectiveness with which they have communicated their ideas (clarity, conciseness, and organization).

When group projects are assigned, instructors are faced with a different problem. Each team produces only one piece of work but performance must ultimately be assigned on an individual basis. Some instructors handle this problem by assigning the same grade to every member of the team. This works well when the proportion of the overall course grade that is attributable to the team effort is relatively small, when the teams function well, and each individual's contribution to the team effort is relatively equal. When one of these conditions are not met, assigning the same grade to every member of the team is likely to lead to a great deal of dissatisfaction.

One method that is widely used to assess individual performance in a team environment is the peer evaluation. Group members may be asked to assign each member of the team a grade based on the individual's contribution to the team's efforts. Alternatively, each team member may be asked to assign each member of the team some number of points out of a fixed total. Because this is also a subjective evaluation, it is important to be clear regarding what the team members are being asked to evaluate.

It is also critical that students know that their individual grade for the team project will be adjusted based on their evaluation by their peers. This has the impact of eliminating the "free rider" problem and allowing students to determine their contribution to the team project based on their desired grade, like they would for an individual project assignment. Informing students in the early stages of the team project that peer evaluations will be used as a means of performance assessment has the additional advantage of limiting problems between group members because members recognize that they will be rewarded based on their contribution and that free riders will be punished.

6.0 Making the Transition

Capstone courses are a breed apart; they are designed to be that way. Agribusiness capstone courses are intended to synthesize the "building blocks" of our curriculum into a "house" of agribusiness, and to serve as a bridge between the relative safety of the well-defined college learning environment and the relative uncertainty associated with the more self-directed world of agribusiness. As such, capstone courses should not be expected to look like other courses.

In reality, instructors sometimes have trouble making the transition to facilitators, and students very often have a great deal of trouble making the transition to self-motivated, self-directed learners. Students are much more addicted to the lecture-

based, dependent learning style than we often realize. Ironically we (as a profession) are the ones who fostered, or at least contributed to, this addiction. Nevertheless, the transition is often difficult and so must be dealt with early and often in order to facilitate a positive and successful capstone learning experience.

A clear delineation of the facilitator's expectations of course participants is critical in achieving the desired learning outcomes. As with any new experience, unknown expectations lead to unnecessary frustration on the part of students and, in turn, the facilitator.

When behavioral, attitudinal, and performance expectations are clearly communicated, the stage is set for a positive capstone learning experience. A supportive attitude and positive feedback from the course facilitator(s) help successfully cement the synthesis, create self-motivated and self-directed individuals, and build a strong bridge to success in the world of agribusiness.

7.0 Implications for the Agribusiness Capstone Professor

This paper has discussed the benefits of using strategic management principles as the cornerstone for building the agribusiness capstone experience. The necessity for agribusiness firms to create and implement strategies that build a sustainable competitive advantage in turn necessitates the development of strategic management skills in the leaders/managers of the future. As such, the objectives of a capstone course lean heavily toward the integrative development of strategic decision-making competence. This has a number of implications for the capstone professor.

Teaching strategic-management-related material to undergraduates (neophytes) is particularly challenging given that they have little or no on-the-job experience. Their only exposure to the so-called real world may have come through internships or other types of temporary employment. This puts added pressure on the capstone professor to properly "set the stage" in terms of the application (and importance) of strategic management principles.

The difficult task of choosing text materials, case studies, and business simulations is exacerbated by the lack of materials written specifically with agribusiness applications and targeted for agribusiness-oriented audiences. Thus, it may take considerable effort for the capstone professor to "agribusiness-ize" course content in terms of both ancillary materials and class discussion.

Because of the aforementioned pedagogical dilemmas, capstone courses become a dynamic entity of their own with little standardization between years. Professors who desire to build a stable, non-changing course to teach year in and year out

should run in the other direction as fast as possible (capstone courses are not for the feint of heart).

Measuring student performance has and will remain categorically challenging. Standard measures of classroom performance are redefined by the very nature of the capstone experience. Perhaps by evaluating students using the same performance measures that are being used by agribusiness firms to evaluate their relative performance (e.g. the balanced scorecard approach put forth by Kaplan and Norton, 1996), the expected outcomes may be measured more accurately and reflect what will be expected from students after graduation.

Faculty who teach capstone courses must realize that the necessary communication and feedback linkages required for effective course organization are time intensive. Capstone courses are not a "lecture and leave" type of course. Capstone professors must carefully design assignments and develop appropriate feedback linkages to ensure student motivation.

Given the nature and goals of agribusiness capstone courses, it is difficult to know if the optimal set of activities is being incorporated to maximize learning outcomes in a particular situation. Maybe it depends on the university, maybe on the students, but more likely it depends on the skills and perceptions of the particular faculty involved. While the optimal set of capstone activities remains an open question, there are, no doubt, many paths to success.

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