The Evolution of Capstone Sequences for Undergraduate Programs

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Capstone courses enhance critical thinking, collaboration, and theoretical application while offering integrative and culminating experiences for students. This paper explores the evolution of capstone courses within a department by presenting a case study to guide educators in developing or refining such programs using a capstone typology. The paper draws on 15 years of experience to outline strategies for curriculum integration, resource allocation, and industry collaboration. After reviewing the relevant literature, it provides insights into the effective implementation and improvement of capstone courses and concludes with recommendations for future exploration to optimize student outcomes and better prepare them for professional success.

Keywords: capstone courses, undergraduate curriculum, experiential learning, service learning, curriculum development, curriculum change process

INTRODUCTION

Undergraduate and graduate programs are expected to offer "timeless leadership" skills, such as communicating effectively, building relationships with colleagues, customers, and clients; actively listening; and appreciating the perspectives of others, as recently highlighted by the Association to Advance Collegiate Schools of Business (Shinn, 2024). This expectation coincides with the World Economic Forum's (2023) "Future of Jobs Report" findings that most of the top ten core skills required by today's workplaces are soft skills related to cognition, self-efficacy, and working with others. Though technologically based skills are crucial for graduates to benefit future employers, educational institutions must provide students with experiences to facilitate the development of these soft skills. Recommended methods include group work, discussion-based activities, and project-based learning, all of which provide

opportunities for students to improve their communication, critical thinking, and problem-solving abilities, the essential skills for success in today's business environment (Busson, 2023).

Capstone courses offer a unique way to combine these methods to develop soft skills. The capstone experience is an opportunity to consolidate learning (van Acker, Bailey, Wilson, & French, 2014), foster professional identity (Caza & Creary, 2016), and cultivate a network of peers and mentors (English, de Villiers Scheepers, Fleischman, Burgess, & Crimmins, 2021), which sets the foundation for future career success and lifelong learning. Using this perspective to structure capstone courses can prepare students for the multifaceted nature of the business world (Bruhn & Camp, 2004), contribute to a sense of pride in their accomplishments (McKinney & Day, 2012), and motivate them to take ownership of their learning (Schwering, 2015). Our journey toward these ends was prompted by a newly appointed dean at our institution who paved the way for developing a multipronged capstone program housed in the Business and Management Department.

As a bridge between theory and professional practice from the perspectives of academic programs and their students (Braunsberger & Flamm, 2013; Inamdar & Roldan, 2013), the capstone course is a pivotal component of undergraduate business education due to enhancing student learning by providing the practical application of theoretical knowledge, fostering teamwork, and developing problem-solving and information competency skills (Gilinsky & Robinson, 2008; Goold, 2003; Whetten & Clark, 1996). This course synthesizes learning across the curriculum, offers students hands-on experience solving real-world business challenges, prepares them for the complexities and dynamics of the business world, and often features case studies and simulations (Inamdar & Roldan, 2013; Stephen, Parente, & Brown, 2002) that integrate acquired knowledge throughout students' time in the program of study. As such, capstone courses are recognized for their value in synthesizing knowledge across various business disciplines and preparing students for the workforce (Keithley, Schmidt, & Shedlin, 1965). They have become increasingly common in undergraduate management and business programs (Henscheid, 2000; Vieregger & Bryant, 2020). Hence, we share insights from our longitudinal process of launching and maintaining five capstone course sequences. We hope our experiences offer relevant considerations for educators in managing undergraduate programs as they seek to optimize capstone experiences for their students.

LITERATURE REVIEW

Creating interdisciplinary capstone courses and projects is a way to address curriculum integration (Henscheid, 2000; Richter & Schmidt, 2008). These courses cohesively integrate concepts and methodologies from multiple academic fields (e.g., accounting, finance, marketing, operations management, and human resource management) to encourage students to apply critical thinking, teamwork, and creativity skills and perspectives to complex problems. This interdisciplinary approach encourages collaboration among students with different specializations and fosters a comprehensive understanding of how each function contributes to overall business strategy. Therefore, the educational experience offers comprehensive and relevant to real-world scenarios.

Co-curricular activities in management capstones are vital for enhancing the learning experience by providing practical applications of theoretical knowledge. These activities (e.g., workshops, seminars, competitions, and industry interaction sessions) complement the academic curriculum by allowing students to develop essential skills (e.g., teamwork, leadership, and communication). They offer opportunities for networking, real-world problem-solving, and personal growth to help make the transition from academic settings to professional environments smoother and more effective.

Additionally, schools are encouraged to produce "good citizens" (Sweeney, Detjen, Bicen, & Zeng, 2024) by incorporating a culture of experiential learning (Kolb, 2014), service learning (Eyler, Giles, & Braxton, 1997), and civic engagement in their classrooms. Thus, schools have designed their capstone courses to address these aspects by implementing capstone courses that pair management consulting teams with local organizations as an option to fulfill capstone course requirements (Braunsberger & Flamm, 2013; Kenworthy-U'Ren & Peterson, 2005; Robinson et al., 2010). Others have answered the call for student transformative learning initiatives via entrepreneurial and innovation coursework (Bhatnagar, 2024;

Mezirow, 2006). These responses have highlighted employers' and other higher education stakeholders' encouragement in expanding capstone course experiences.

Projects designed with input from industry professionals can further enrich students' educational experiences by ensuring that they gain practical insights and skills relevant to current business challenges. Community-based capstone projects have a profound impact by connecting student learning with societal needs (Godfrey, Illes, & Berry, 2005). These projects foster students' civic responsibility and social awareness by applying business and management principles to address real community issues. The hands-on experience enhances students' problem-solving and leadership skills while making a tangible difference in the community (Papamarcos, 2005). Moreover, these projects often lead to increased community engagement with the educational institution, strengthening partnerships and fostering new collaboration opportunities (Desai et al., 2014; Sweeney et al., 2024).

Nevertheless, student capstone experiences can be challenging to integrate into a business school curriculum for several reasons. While various capstone options can enhance students' experiences, course variety can be difficult and time-consuming to develop. Capstone courses typically require careful student preparation through integrated or sequenced prerequisite and "co-requisite" courses embedded in a business school's curriculum (Hamilton, McFarland, & Mirchandani, 2000). Capstone courses typically also require more resources for students and faculty, which can be challenging for administrators to attract or develop. These courses also offer an opportunity for shared passion and dedication from students and instructors that must be reinforced and balanced throughout the capstone experience. Therefore, student and faculty placement in capstones should be carefully managed to obtain the most value from these shared passions.

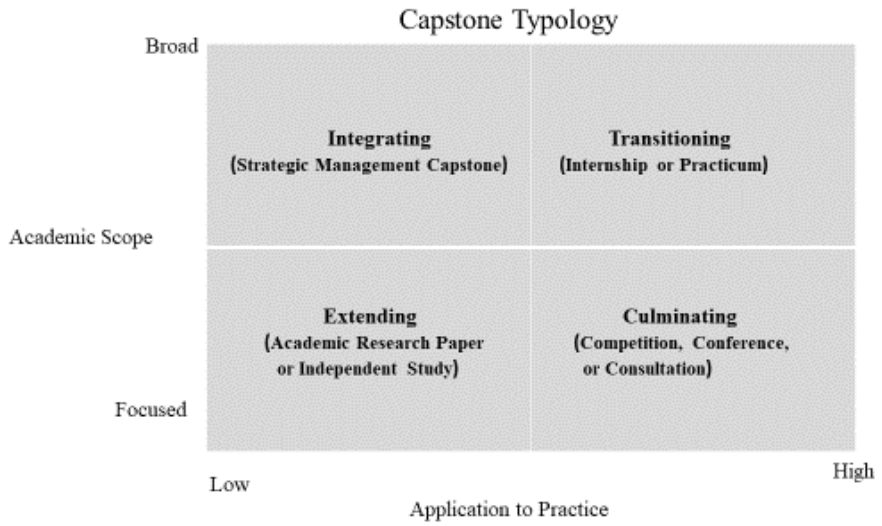
Capstone courses culminating in a competition, consultation, or peer-reviewed research opportunity can provide value via externally generated assurance of learning for students, student teams, and curriculum development efforts. Well-implemented capstones have systemic impacts on the overall business school curriculum as well as student and faculty satisfaction, both of which need to be carefully monitored and capitalized upon (Caza, Brower, & Wayne, 2015; Gorman, 2011; Weintraub, Lee, & MacCormack, 2020).

As highlighted above, designing a capstone can be challenging for many reasons (Behdinan, Pop-Iliev, & Foster, 2014), such as aligning projects with real-world business scenarios, securing resources and industry partnerships, and ensuring that projects are scalable and adaptable to student interests and curriculum requirements. Balancing these elements requires careful planning, faculty collaboration, and ongoing evaluation to maintain the relevance and impact of capstone courses.

THE CAPSTONE TYPOLOGY: RATIONALE FOR CAPSTONE SEQUENCES

Cycyota, Heppard, Green, Heyler, and Harting (2020) developed a typology explaining the rationale for transforming classroom learning across multiple business disciplines into capstone course options to address the complexity of designing and implementing them. These courses are tailored to provide a culminating experience that aligns with students' academic scope (i.e., broad vs. focused) and their desired level of practical application (i.e., from low to high) at the end of their program of study (Martin, 2018; Wagenaar, 1993). We elaborate on our process for developing capstone experiences at the "integrating" (i.e., broad in academic scope and low in application to practice, such as the traditional strategic management capstone) and "culminating" (i.e., focused in academic scope and high in application to practice, such as consulting and other capstones ending in a competition) sections of the typology (see Figure 1).

FIGURE 1
CAPSTONE TYPOLOGY



Cycyota et al., 2020

A discussion of the evolution and scaffolding of our initial capstone offerings and expansion into additional capstone offerings follows. We explore the key considerations encountered within our unique constellation of capstone offerings.

Genesis of Our Capstone Courses

In our case, the dean of our institution, who formerly led the Management Department, paved the way for our capstone course progression. His experiences deeply influenced his interest in capstone courses in a parallel program, which featured a two-semester course progression emphasizing the integration and application material across the program, student choice, and promoting a positive student experience. The two-semester progression required students to utilize broad skills from various disciplines and solve complex problems through project-focused, high-engagement, collaborative efforts.

Recognizing the complexities of constructing engaging capstone options, the dean assembled a team of senior faculty to participate in creating a structured yet flexible framework for capstones to enhance student learning, foster interdisciplinary collaboration, and align with the business program's educational goals to ensure a practical and impactful student experience. This initiative acknowledged multifaceted challenges, including curriculum integration, resource allocation, and relevance to industry trends.

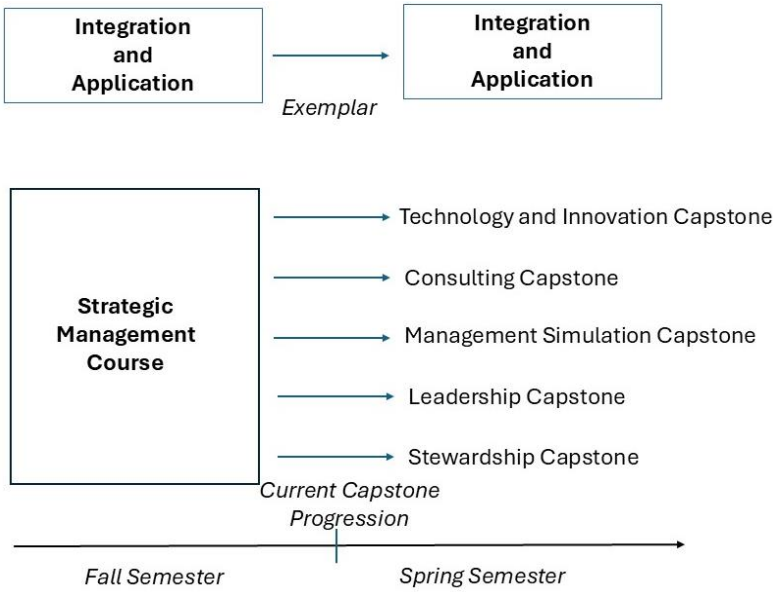
A condition imposed by the dean was that the existing strategic management course served as the foundation in a year-long capstone sequence, which echoed the successful year-long capstone sequence of courses found in Operations Research and other engineering programs. We found that many programs at both the undergraduate and graduate levels consider courses focusing on strategic management as the culminating course for management programs, with institutions dedicating significant resources to developing and revising these courses to keep up with projected industry needs (Alstete & Beutell, 2016; Inamdar & Roldan, 2013).

The strategic management course was slated to become a prerequisite foundation for a subsequent course during the second semester of the senior year. After taking the strategic management course, students would enroll in one of the second-semester capstone course options that challenged them to tackle complex, integrative projects with greater depth and understanding. This course of action was intended to enhance the curriculum's coherence and reinforce the application of strategic concepts within broader contexts.

The culminating second semester of the capstone sequence evolved to present options for students to select from so that they could undertake a project that showcased a specific aspect of their management

education and a comprehensive understanding of management theories and practices. This combination resulted in significant, tangible achievement within their chosen area of interest. Our objective is to share how our sequence of capstone courses (see Figure 2) serves as an exemplar to support the transition from undergraduate education to professional roles and graduate education by highlighting how they contribute to the development of critical thinking, problem-solving skills, and the ability to collaborate effectively (Desai, Tippins, & Arbaugh, 2014; Gorman, 2010; Robinson, Sherwood, & DePaolo, 2010).

FIGURE 2
SEQUENCE OF CAPSTONE COURSES



Initial Capstone Course Offering

Our initial capstone offering, Innovation and Technology, was designed to be taken after Strategic Management in the fall semester. It acknowledged early innovators' engineering and entrepreneurial efforts from modern Western history. This capstone course began with a simple narrative about the Wright Brothers to illustrate the essence of innovation: identifying a need, imagining the seemingly impossible, and turning that vision into reality via technical acumen and perseverance. This historical overview served as the foundation of the course's philosophy and set the stage to invoke a spirit of exploration and innovation among the course participants.

A key aspect of the course was its emphasis on the early stages of product or service innovation, which employed a systematic development and assessment process. Students began identifying emerging needs in the market and determining whether ideas were innovative, viable, and impactful. This approach underscored the importance of critical thinking and strategic planning in the innovation process to prepare students for the realities of entrepreneurship and product development.

During this initial capstone offering, an early innovation was the creation of PointScribe, a software program developed to help children with learning, upper-extremity, and fine-motor disabilities improve their writing skills. PointScribe reflected the intersection of technology and societal needs designed to address communication challenges within a segment of the community by addressing an important and immediate need through technological innovation. Consisting of a comprehensive library that includes block upper case letters, lower case letters, numbers, and various shapes, PointScribe helped these children practice tracing letters, numbers, and shapes on a touchscreen using a stylus and facilitated learning basic handwriting skills. Moreover, PointScribe enhanced the learning experience by incorporating interactive animations, vibrant colors, music, and other engaging elements.

PointScribe's development, business model, and accompanying plan garnered appreciation from members of this community, and it was entered in several collegiate business plan competitions (Emery, 2005). This project served as a practical application of theory to practice and demonstrated the potential impact of technology to improve lives, which set a precedent for future course iterations.

Following this initial success, the course saw a significant increase in enrollment in its second year, a testament to its popularity among students. Faculty interest in the course also grew, with several military members being sponsored for Ph.D. programs in innovation and entrepreneurship. This investment helped to sustain and enrich the program and ensured its continued relevance and impact. This surge in interest supported the expansion of the course's scope, which led to multiple projects per course offering that aimed to serve the community or develop business plans for traditional entrepreneurship competitions. This evolution marked a shift to exploring innovative solutions across various domains. Institutional funding provided essential support for prototyping potential innovative ideas into tangible projects and for travel to entrepreneurship competitions, which expanded the students' exposure to and experience within the broader entrepreneurial ecosystem.

After several rounds of this capstone, it became apparent that students would benefit from participating in a precursor course (i.e., before the capstone) emphasizing the theory and practice of innovation before undertaking the complex projects that typified the Innovation and Technology course. Thus, students would be better prepared to optimize their product or service development from the outset of the second-semester course. The addition of the precursor course fostered interdisciplinary thinking and encouraged students from diverse academic backgrounds to collaborate, share perspectives, and potentially embark on future interdisciplinary projects. It also helped many students determine the feasibility of projects that might be continued into a second semester. This approach enriched the learning experience and mirrored real-world scenarios where innovation often results from the confluence of different fields and ideas. Thus, the Innovation and Technology capstone sequence ultimately included 1) Strategic Management in the fall term, 2) a precursor course in the fall term, and 3) a project-oriented course in innovation in the spring term.

Subsequent Capstone Offerings

A second capstone, Management Simulation, was launched to focus on the theory and practice of strategic management principles. Like the Innovation and Technology capstone, it included Strategic Management in the fall semester. It proceeded to Management Simulation in the spring semester, where students from our institution formed teams and competed with teams nationwide for external validation and recognition.

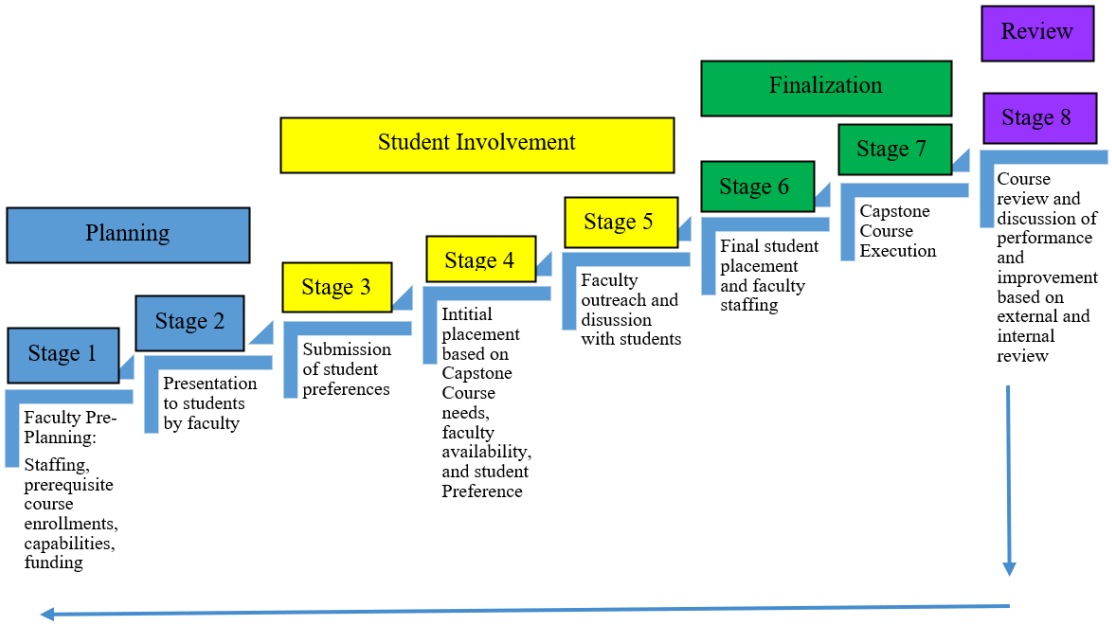
The success of this endeavor encouraged another faculty member to launch the Consulting Capstone, in which students engaged as consultants for nonprofit organizations in the local community. The initial offering of the course involved a small cadre of students consulting with local nonprofits. The success of this capstone was reported by students and the nonprofits they served, so a decision was made to expand the offering in terms of the number of faculty (i.e., two), students (i.e., 65), and nonprofit clients (i.e., 23) involved. Since the initial offering in 2015, approximately 500 students have assisted over 190 clients in our local community, which has resulted in accolades for our students and institution. Similar to the Innovation and Technology Capstone sequence, an elective precursor course has been offered since 2018 that emphasizes the theory and practice of consulting and process consultation, which supports effective consultation where the client owns the problem and the solution while the consultants use their expertise to facilitate the change (Schein, 1995, 1997, 1998).

Two additional spring semester capstone options were introduced three years ago. The first, Leadership Capstone, included Strategic Management in the fall, while the spring semester culminated with the students' participation in a nationwide leadership process competition. The second addition was the Stewardship Capstone, a follow-up to the Strategic Management and Investments courses offered during the fall semester.

ANNUAL CAPSTONE COURSE DEVELOPMENT PROCESS

Developing each of our capstone course sequences has involved a detailed and structured process to ensure that the faculty and students are well-prepared and that the course meets the educational objectives effectively. The process consists of an iterative eight-step sequence of events (see Figure 3) that occurs annually to facilitate the placement of our students into the appropriate second-semester course. The four phases of the process are planning, student involvement, finalization, and review.

FIGURE 3
ANNUAL CAPSTONE COURSE PROCESS



Planning Phase

Stage 1: Faculty Pre-Planning: Staffing, Prerequisite Course Enrollments, Capabilities, and Funding

This phase involves faculty and administrative staff collaborating to plan the courses. Key considerations include identifying the faculty members to lead the second-semester capstone courses by evaluating their expertise, interest, and availability. The prerequisite courses students must complete before enrolling in the capstone courses are reviewed to ensure they include foundational readings and assessments to determine whether students have ample opportunities to acquire the necessary knowledge and skills. The resources and capabilities (e.g., competitive venues, software, and fieldwork/client opportunities) that might be needed for the capstone projects are carefully assessed. Securing funding for resources, guest speakers, field trips, and special projects requiring financial support is key to this phase.

Stage 2: Presentation to Students by Faculty

Faculty members introduce each second-semester capstone course to potential students by highlighting the course objectives, expected outcomes, project options, and evaluation criteria. This presentation occurs halfway through the first-semester Strategic Management course to inform students about each course's structure, expectations, and the value it adds to their education and future career opportunities.

Student Involvement Phase

Stage 3: Submission of Student Preferences

Following the presentation outlined above, students interested in enrolling in one of the second-semester capstone options that is not Management Simulation submit their preferences via an application. The application asks students to rank-order each second-semester capstone course they are interested in, indicate their completion of any required prerequisite courses, provide why they are interested in and/or passionate about each second-semester capstone course, and what they hope to contribute. Student interest and passion are critical to the capstone course selection. Students can also include their preferred project topics, desired faculty advisors, and goals they hope to achieve during the second-semester capstone course. Surveys and interviews can also be used to assess appropriate student placement in capstone courses. For instance, surveys can quantitatively and objectively measure students' self-assessed strengths, weaknesses, and interests to offer broad insights for guiding course design and project assignments. At the same time, interviews provide qualitative depth and reveal nuanced views and individual student aspirations. These methods enable our educators to tailor capstone experiences to student profiles with enhanced engagement and learning outcomes by aligning projects with students' capabilities and career goals to create a more personalized and effective educational experience.

Stage 4: Initial Placement Based on Capstone Course Needs, Faculty Availability, and Student Preference

The course coordinators and faculty review student submissions and make initial placements based on the needs of the capstone course (e.g., project scope and objectives), faculty availability, and student preferences. This step aligns resource availability, faculty expertise, and student interest and passion.

Stage 5: Faculty Outreach and Discussion With Students

After initial placements, faculty members contact students for one-on-one or group discussions regarding placement. These meetings help clarify expectations, address concerns, and finalize project details. Students can express their interests more thoroughly while the faculty offers guidance. Faculty members can also recruit students who may have been undecided in the initial application and placement process. Pairing students with capstone options involves a comprehensive process to align their academic interests, career goals, and personal aspirations with the most suitable capstone projects. Subsequent surveys, one-on-one meetings, and interviews can gather insights into students' strengths, weaknesses, and areas of interest. Sometimes, assessment tools may also assess students' knowledge and adequate preparation for a particular capstone experience.

For example, a student struggling with basic knowledge in corporate finance would not be best suited for a capstone focusing on investment strategies for a community organization. Thus, we would require a minimum "B" or better grade in our Corporate Finance course to enroll a student in the Investing Strategy capstone. This personalized approach ensures that students are matched with capstone projects that complement their educational journey and propel them toward their professional objectives to enhance their educational experience and outcome.

Finalization Phase

Stage 6: Final Student Placement and Faculty Staffing

Based on discussions and new developments, final adjustments are made to student placements and faculty assignments. This step ensures that all students are placed into projects that suit their educational and career aspirations while balancing faculty workload and expertise. Our faculty advisors crucially guide students toward appropriate capstone options based on their academic records, personal achievements, and career goals. Our approach ensures that capstone experiences are personalized, foster deep engagement, and enhance the learning experience by connecting academic theory with practical application tailored to each student's future ambitions. However, institutions may also employ technology (e.g., matchmaking platforms) where students can explore various projects and express their preferences.

Stage 7: Capstone Course Execution

The capstone course officially begins. Students work on their projects under the guidance of their faculty advisors by applying theoretical knowledge to practical, real-world problems. This phase includes regular meetings, progress reports, and possible presentations or fieldwork, depending on the project's nature.

Review Phase

Stage 8: Course Review and Discussion of Performance and Improvement Based on External and Internal Review

After the course concludes, faculty, students, and sometimes external stakeholders (e.g., industry partners and community organizations involved in projects) review the courses' outcomes. This review evaluates student performance, the relevance and impact of projects, and the overall course structure. Feedback identifies strengths and improvement areas to inform future iterations of the capstone course.

This structured approach ensures that our capstone courses are relevant, engaging, and valuable for our students by allowing them to apply their learning to real-world contexts while facilitating continuous course improvement based on feedback and outcomes.

BENEFITS OF CAPSTONE COURSE SEQUENCES

External Assurance of Learning and Accreditation Benefits

Capstone courses provide the critical external validation of learning outcomes through a tangible measure of the competencies and skills students acquire throughout their academic programs. As previously stated, these courses require students to apply theoretical knowledge to real-world problems and demonstrate their readiness for professional careers. As such, capstone projects can be used as evidence of program effectiveness during accreditation review to showcase the institution's commitment to high educational standards (Hammer et al., 2018; Kehal, 2020). The successful completion of these courses underscores graduates' practical and analytical skills, directly impacting program accreditation by aligning with industry standards and expectations.

Assurance of learning (AoL) in capstone courses involves systematic evaluation to ensure learning outcomes align with the program's educational goals and standards. This process validates the curriculum's effectiveness while identifying improvement areas to ensure the program remains relevant and rigorous. AoL provides a framework for measuring student achievement and program impact, which are crucial for maintaining accreditation standards and demonstrating the value of the educational experience to external stakeholders (Rexeisen & Garrison, 2013).

AoL in capstone courses, especially in undergraduate management education, is crucial for evaluating whether students have met the program's learning goals. It provides tangible evidence of the effectiveness of the curriculum in imparting the necessary skills and knowledge. AoL helps identify areas of strength and opportunities for improvement to ensure the program remains relevant and competitive. This process aligns educational outcomes with the expectations of employers, accrediting bodies, and other stakeholders by demonstrating the value and impact of the management program on students' professional readiness (Kehal, 2020).

Impacts on Curriculum, Student Satisfaction, and Instructor Motivation and Engagement

Well-integrated capstone courses significantly impact curriculum development by fostering interdisciplinary learning and ensuring the curriculum remains aligned with evolving industry standards. These courses play a pivotal role in curriculum development by ensuring academic programs align with real-world requirements (David, David, & David, 2021). These courses foster a holistic educational approach that encourages interdisciplinary learning and the application of theory to practice (Sheppard, Nastasi, Hole, & Russell, 2011; Whetten & Clark, 1996). This alignment enriches the curriculum by incorporating current trends and technologies to ensure that graduates are well-prepared to meet the

challenges of their respective fields. Through these courses, educational institutions can continuously update and refine their curriculum to keep it relevant and dynamic.

These courses enhance satisfaction for students by providing practical experience and a sense of preparedness for the professional world, which boosts their confidence and engagement (Caza et al., 2015). Faculty motivation is also positively affected, as capstone project mentoring offers professional growth and satisfaction opportunities while witnessing student success and innovation. Capstone projects significantly enhance student and faculty motivation and satisfaction by bridging theoretical learning with practical application.

For example, these projects offer students a sense of achievement and real-world experience, which increases their engagement and confidence in their skills. Faculty may find satisfaction in mentoring and guiding these projects, which allows them to connect with students on a deeper level and see the direct impact of their teaching on students' professional readiness. This mutual benefit strengthens the educational experience and fosters a positive and productive learning environment. Thus, capstone courses serve as a crucial nexus between theoretical knowledge and practical application, which benefits curriculum development, student outcomes, and faculty engagement.

CHALLENGES OF CREATING AND DEVELOPING NUMEROUS CAPSTONES

Developing Course Variety and Scalability

Responding to the decades-long call for bringing excitement into higher education classrooms is no easy feat (Bonwell & Eison, 1991). It can be especially challenging for institutions considering modifications to their capstone courses and curriculum. Offering a diverse range of capstone experiences presents unique challenges in terms of scalability (e.g., the number of students who can take the course, the number of faculty required, and the number and size of projects) and curriculum integration. Strategies to address scalability include leveraging technology to create virtual or hybrid capstone options to accommodate more students (i.e., virtual student teams utilizing a computerized simulation) without compromising the quality of the learning experience while partnering with industry and community organizations with real-life projects for students to support. These opportunities provide scalable, real-life projects for students that enhance their learning while meeting program and curriculum goals.

Courses designed for scalability and curriculum integration require careful planning to ensure that learning objectives from each discipline are met so that students can see the interconnectedness across different fields of study (Alstete & Beutell, 2016). Effective communication and collaboration among faculty are crucial for coordinating these efforts to ensure that capstone experiences align with educational objectives and student learning outcomes. These approaches enrich students' educational experiences and better prepare them for the complexities of the modern workforce.

Building "Feeder" Preparatory Courses

Optional or required prerequisite courses are pivotal in equipping students with knowledge and skills for successful capstone participation by bridging foundational studies and the complex, multidisciplinary tasks encountered in capstone projects. Nevertheless, achieving this outcome is often a difficult proposition. Thus, "feeder" courses cover essential theoretical concepts, practical skills, and project management techniques to ensure students are well-prepared for the demands of capstone projects. Implementation involves a combination of classroom learning, hands-on exercises, and team projects that simulate real-world challenges.

These foundational courses prepare students for their capstone experiences and future professional careers by fostering critical thinking, collaboration, and problem-solving skills. Hence, students gain a comprehensive understanding of each subfield of the broader management discipline and prepare to apply their knowledge in practical settings, which enhances their readiness to tackle capstone projects effectively. This sequential approach ensures that students develop a comprehensive understanding of their field, critical thinking, and practical skills, which prepare them effectively for the multifaceted demands of capstone projects.

Finding Course Resources

For management capstones, beneficial partnerships and alliances include collaborations with local businesses, nonprofit organizations, and industry leaders that provide real-world problems for students to solve with practical experience and networking opportunities. Alliances with established alumni can also offer mentorship and insights into current industry trends (Vieregger & Bryant, 2020). Collaborating with research institutions can enrich capstone projects with cutting-edge knowledge and innovative approaches to enhance students' educational experiences.

Alumni can be approached for capstone partnerships and resources through targeted outreach programs (e.g., newsletters, social media campaigns, and networking events) specifically designed to engage them. Personalized emails or calls that highlight the impact of their contribution on students' education and career readiness can also be effective. Presenting clear opportunities for involvement (e.g., mentorship, guest lectures, or project sponsorship) helps align their interests and expertise with capstone objectives. Engaging alumni through these strategic methods can foster a sense of community and investment in the institution's ongoing success and student development.

Mitigating Challenges

The establishment, growth, and sustainability of capstone courses benefit from a supportive organizational culture. When introducing curricular changes that require resource allocation or reallocation, a common potential barrier is the unwillingness of organizational members to embrace change and endure the accompanying discomfort (e.g., taking on additional duties to ensure that the desired changes occur) before making adjustments that are more permanent to how the system works. Several cultural norms have provided the necessary support for developing our capstone courses and associated continuous improvement efforts. These activities include alignment with programmatic innovations beyond the department or business school that support the mission of the institution overall and often reach beyond the boundaries of the institution (e.g., partnerships with organizations in the local community and the industries that employ graduates); leaders (e.g., department heads, deans, and managers) oriented toward continuous improvement who make every effort to support change to support the mission of the institution (here, the development and refinement of capstone courses over time) regardless of the temporary inconvenience; faculty willingness to take on "additional duties" to bring a capstone to life and make necessary revisions and refinements before the organization has committed to a more permanent inclusion of a capstone; the department or business school must also make space for the skills and passions of the faculty to lead an innovative effort (e.g., establishing a capstone); and, fostering relationships with the local community leaders and members as a function of participating in the same community that may blossom into more intentional collaborations and opportunities for capstone-related collaborations.

While these factors facilitated our progress over the years, we realize these challenges may not be as easily undertaken at other institutions. Hence, we recommend bridging potential gaps between what currently exists and what is needed to move forward with capstone creations through proactive communication and discussing multiple paths forward to align capstone creation with the organizational culture.

CONCLUSION: PATH FOR THE FUTURE

Our collective capstone course development reflections have identified that these courses have played a crucial role in enhancing student learning and engagement. However, future research is needed to explore diverse capstone models across disciplines to comprehensively understand their impact on student outcomes.

Moreover, investigating the role of technology in facilitating capstone projects can provide insights into improving accessibility and collaboration. Institutions may adopt flexible capstone frameworks that accommodate changing industry needs (e.g., incorporation of artificial intelligence) and student interests to ensure the courses remain relevant and impactful. The role of technology in capstone courses is transformative since it enables more interactive, collaborative, and flexible learning experiences.

Technology facilitates virtual simulations, real-time data analysis, and digital project management tools, allowing students to work on complex, real-world problems in a controlled environment. It also supports the remote collaboration essential for interdisciplinary projects and connecting with industry partners. Furthermore, technology aids the assessment and feedback process by providing more detailed insights into student and project learning outcomes.

Future research on capstone courses can measure outcomes and validate their effectiveness through longitudinal studies tracking graduates' career progression, employer surveys assessing workplace readiness, and comparative analysis of student performance pre- and post-capstone. Additionally, implementing standardized assessment tools across multiple institutions can provide broader insights into the pedagogical impacts of capstone courses to allow for a more comprehensive understanding of their value in business education.

Exploring diverse capstone models across disciplines reveals their varied impact on student outcomes. In engineering, project-based models emphasize practical problem-solving and technical skills that enhance job readiness. At the same time, business school capstones often focus on consultancy projects that foster strategic thinking and teamwork. Moreover, creative projects refine students' artistic expression and project management abilities in the arts. Thus, while each model is tailored to specific disciplinary needs, they collectively improve critical thinking, collaboration, and the application of theoretical knowledge, which significantly enriches the educational experience and prepares students for professional success.

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