From Theory to Practice: Tips for Designing and Assessing Capstone Courses

Table of Contents

1. Introduction

The capstone course stands as a cornerstone of undergraduate and postgraduate education, a culminating experience where students integrate and apply their accumulated knowledge to a significant, authentic project. As defined by the Association of American Colleges and Universities (AACU, 2023), these experiences, whether a research paper, performance, portfolio, or exhibit, serve as a critical bridge between academic study and professional or postgraduate life. In Hong Kong, this pedagogical implement is further reinforced by the Outcome-based Approach to Teaching and Learning (OBATL[1]), which emphasises the development of generic intellectual capabilities, core values, and the practical application of knowledge, making the capstone an essential graduate requirement (Chan et al., 2017).

Traditionally, the design of capstone curricula has followed a backward principle, where a synthesis of prior course experience - often focused on demonstrating of discipline knowledge and expressed through the final assessment like a substantial written report (Lee & Loton, 2017), dictates the scaffolding of skills and competences throughout the preceding term. However, the rapid advancement of Generative Artificial Intelligence (GenAI) technology presents a profound challenge to this traditional. While GenAI offers powerful tools for ideation, synthesis, and drafting, it simultaneously disrupts the integrity and validity of traditional, writing-heavy assessments, compelling a critical re-evaluation of the capstone's design and purpose.

It necessitates a strategic redesign of the capstone curriculum for undergraduate and postgraduate programmes. The objective is no longer merely to equip graduates with discipline-specific expertise but to enrich their learning experience by fostering essential AI literacy and the skills to learn and work with GenAI ethically and effectively. This shift aligns with the broader educational mission, as seen in the Graduate Attributes[2] sought by university, which include critical thinking, creativity, and social responsibility, digital literacy, with all competences that must now be defined within a new AI-powered reality.

We argue that an effective contemporary capstone should therefore transcend its traditional format. By incorporating new learning outcomes emphasised interdisciplinary and made learning through hands-on, in-class activities (Chiu, 2024), and redesigned assessment to prioritise process and demonstration over purely written product, we can create a curriculum that is both resilient to technological disruption and more effective in preparing graduates for the complexities of modern society. This document will provide some tips from theoretical principles to practical strategies for designing and assessing such a capstone course.

[1] https://www.ln.edu.hk/tlc/support-for-staff/outcomes-based-approaches-to-teaching-and-learning
[2] https://www.ln.edu.hk/about-lu/lingnan-s-quality-education/graduate-attributes

2. Foundational Design for the Effective Capstone Courses

2.1 Principle and scaffolding of capstone courses

According to Hauhart & Grahe (2014), the following four foundational components should be incorporated and pursued for the capstone course design:

- **Intentionality:** The course must be purposefully designed with clear educational goals, not added as an afterthought or merely to meet external pressures.
- **Collaboration:** Successful design requires early and substantive collaboration among all stakeholders, including faculty, the university, and often external industry partners.
- **Curricular Fit:** The capstone must be seamlessly integrated and complementary to the existing curriculum, ensuring it meaningfully culminates prior learning without redundancy.
- **Professional Standards:** For professional disciplines, the capstone should be designed to incorporate and teach relevant ethical norms and accreditation standards.

In essence, the **principles** define the *what* and *why* of a high-quality capstone, while the **scaffolding** provides the *how*, offering a structured pathway to achieve those ambitious goals. The core principles are to facilitate Authentic Integrative Learning, shifting the value from a final product to the complex, human-centric process of knowledge application, which AI cannot replicate. Scaffolding is the structured support system that breaks the large, complex capstone project into manageable phases, guiding students from inception to completion. These principles and scaffolding are detailed in Table 5 & Table 6.

Table 5. Principles of the capstone curriculum (adapt from (Lee & Loton, 2017; Goodwin et al., 2019))

Principles	Descriptions
Authentic (context)	It directly incorporates the principle of *Authentic and contextualised experiences* and *the Connectedness model's* call for real-world, networked experiences. It implies that the integration should happen in a context that mirrors professional or real-world challenges, not in an abstract, academic vacuum.
Integrative (process)	This is the core of the capstone. It requires students to integrate and extend prior learning to tackle challenging and complex scenarios. This process demands critical inquiry and creativity and can only be successfully navigated with a high degree of student independence and agency.
Transformative (outcome)	The entire process is a transformative learning experience. The culmination of this learning is made visible and solidified through active

	dissemination and celebration, which acts as the final, authentic assessment of the integrated knowledge and skills.

Table 6. Scaffolding of the capstone courses (Britcher, 2023)

Steps	**Descriptions**
Define the Scope	Instructors provide the capstone project outcome, options, and examples early on, allowing students to define their specific problem to solve.
Create a Timeline	A visual timeline with clear phases, deadlines, and milestones is established to help students plan and manage their time effectively.
Develop a Charter (for teams)	For group projects, a charter document helps teams plan tasks, assign roles, assess risks, and establish accountability.
Break into Milestones	The project is divided into smaller, sequential parts (e.g., proposal, annotated bibliography, prototype, presentation), each with its own specific objectives and deadline.
Align Goals	Each milestone's learning objectives are explicitly aligned with the overall project goals and the program's intended learning outcomes.
Allocate Resources	Required tools, software, and support are identified and communicated to students at the beginning of each phase.
Iterate with Feedback	Instructors provide formative feedback at each milestone, encouraging students to revise and improve their work before moving forward.
Finalise Submission	The process concludes with students incorporating all feedback to edit, proofread, and synthesise their work into a polished final deliverable.

Furthermore, the successful implementation of a capstone course requires a meticulously structured process that begins long before the course starts and continues after it concludes. Table 7 outlines a comprehensive approach, from initial faculty planning and student matching to final execution and continuous improvement, ensuring a relevant and impactful experience for all students.

Table 7. Example of Capstone Sequences for Undergraduate Programs (Ferrante et al., 2025)

Phase	**Stage**	**Key Activities & Description**
Planning Phase	1. Faculty Pre-Planning	Faculty and admins collaborate to secure resources: select faculty leads, confirm student prerequisites, assess needed capabilities (software, venues, client opportunities), and secure funding.
	2. Presentation to Students	Faculty introduce capstone options to students mid-way through the previous semester. They detail course objectives, project options, expected outcomes, and the value for students' future careers.

Student Involvement Phase	3. Submission of Student Preferences	Students submit a detailed application, ranking their preferred capstone courses. They justify their interest, outline goals, and list completed prerequisites. Surveys/interviews may be used to assess fit.
	4. Initial Placement	Coordinators make initial student placements based on a balance of three factors: 1) Capstone project needs, 2) Faculty availability, and 3) Student preferences/qualifications (e.g., minimum grades in prerequisites).
	5. Faculty Outreach & Discussion	Faculty meet with students (individually or in groups) to clarify expectations, address concerns, and finalise project details. This ensures a personalised match between student aspirations and project requirements.
Finalization Phase	6. Final Placement & Staffing	Final adjustments are made to student placements and faculty assignments based on the outreach discussions. The goal is to finalise a roster that suits all students' goals while balancing faculty workload.
Execution Phase	7. Capstone Course Execution	The course begins. Students work on their projects under faculty guidance, applying theory to real-world problems. This involves regular meetings, progress reports, and presentations or fieldwork.
Review Phase	8. Course Review & Improvement	After the course ends, faculty, students, and external stakeholders (e.g., industry partners) review outcomes. Feedback on performance, project impact, and course structure is used to improve future iterations.

2.2 Learning outcomes

Crafting Precise Learning Outcomes

A well-constructed capstone learning outcome consists of a verb (denoting an action) and an object (usually a noun). The verb specifies the intended cognitive process, while the object describes the knowledge students are expected to acquire or construct (Columbia Business School, n.d.). According to Lee & Loton (2017), these outcomes commonly demonstrate achievement across four broad themes: knowledge, engagement with others, personal qualities, and procedural capabilities. As illustrated by Lee & Loton (2017) in Table 1, these capacities are organised thematically alongside their associated learning outcomes. It is realistic to expect significant variation in the emphasis and depth of these achievements across individual capstones, with some elements being demonstrated at a higher level than others.

Similarly, according to Vale et al. (2024), the capstone experience encompasses three core categories: values, defined as one's principles and judgment of what is important in life; skills/competencies, which are the broad abilities needed to perform well in academic, professional, or social contexts; and attitudes, referring to one's characteristic way of thinking or feeling, as reflected in behaviour. Their findings indicated that participants considered

values to be the most important of these categories, while skills/competencies were perceived as the least important. Table 2 showed the three categories of the capstone experience and their associated outcome (Vale et al., 2024).

Table 1. Capstone learning outcomes (Lee & Loton, 2017)

Knowledge	
Abstract	Draw upon historical, theoretical and conceptual discipline knowledge
Contextual	Integrate and apply knowledge of the context in which the profession operates, as well as more broadly the ethical, regulatory, cultural and social contexts of the discipline
Technical	Select and apply appropriate academic and professional procedures, techniques, tools and rules
Engagement with others	
Communication	Clearly communicate ideas and arguments as part of day-to-day practice and more formally, to multiple audiences
Teamwork	Work collaboratively and cooperatively with others within and outside of the discipline to effect positive outcomes
Stakeholders	Collaborate with, and/or respond appropriately to the needs of stakeholders as partners and consumers
Personal qualities	
Self-development	Use critical self-reflection and the feedback of others to identify and act on opportunities for learning
Self-direction	Independently devise plans and take responsibility for own work, seeking advice when necessary
Ethics and judgment	Make informed and ethical judgments in relation to day-to-day activity and the production of outcomes
Procedural capabilities	
Investigation and evaluation	Seek and critically evaluate relevant existing and new information as the basis for developing outcomes
Problem-solving and creativity	Use a range of processes to continuously define the components of, and propose solutions for, complex problems and scenarios
Production and aesthetic	Complete work to professional quality, demonstrating a range of production and/or aesthetic skills

Table 2. Three categories of the capstone experience (Vale et al., 2024)

Categories	Associated Outcomes
Values	Thoughtfulness; Integrity; Inter-cultural sensitivity; Responsibility; Empathy; Professionalism; Compassion; Openness; Citizenship; Ethical sensitivity; Career orientation;
Skills/ Competencies	Critical thinking; Communication - written; Communication - verbal; Lifelong learning; Interpersonal skills; Problem solving; Critical reading; Personal and Organizational management; Teamwork; Information literacy; Research;

Attitudes	Self-aware; Open-minded/ tolerant; Societally aware; Insightful; Spiritual; Concerned for the well-being of others; Responsible; Curious; Resilient/ Determined; Motivated/ Enthusiastic; Honest; Independent/ Self-confident; Professional;

Utilizing Taxonomies and Verbs for Alignment

When designing course learning objectives, you will delve into defining the tasks that showcase students' attainment of desired outcomes. What knowledge, skills, and activities should students possess? Utilizing learning taxonomy aid in delineating the expected work. Harvard University's Bok Centre offers a range of verbs categorised by Cognitive, Affective, and Psychomotor domains to guide assignment creation. (Harward University, n.d.)

Table 3. Verbs for assignment by different domains (Harward University, n.d.)

Domain	Level	Characteristic	Verbs for assignments
Cognitive Domain	Remember	Exhibit memory of previously learned material by recalling facts, concepts, and answers	Cite; Define; Find; Highlight; Label; List; Locate; Name; Recall; Recognise; Reproduce; Retrieve; Search
	Understand	Demonstrate an understanding of the facts by explaining ideas or concepts	Annotate; Convert; Demonstrate; Describe; Discuss; Explain; Extend; Identify; Interpret; Outline; Paraphrase; Predict; Research; Review; Summarise
	Apply	Use existing knowledge to solve new problems or apply acquired knowledge in new situations	Apply; Articulate; Calculate; Change; Choose; Complete; Dramatise; Execute; Illustrate; Interpret; Operate; Practice; Relate; Share; Show; Teach; Use
	Analyse	Examine and break information into parts to explore relationships	Analyse; Categorise; Classify; Compare; Conclude; Contrast; Correlate; Deconstruct; Deduce; Differentiate; Distinguish; Edit; Investigate; Reverse engineer Select; Separate; Solve
	Evaluate	Defend opinions and decisions; justify a course of action by making judgements about information	Argue; Assess; Collaborate; Criticise; Critique; Debate; Decide; Defend; Estimate; Evaluate; Hypothesise; Judge; Justify; Measure; Moderate; Predict; Recommend; Reflect; Test; Verify
	Create	Generate new ideas and products or compile information in a new way	Assemble; Compile; Compose; Construct; Create; Design; Develop; Draft; Formulate; Invent; Model; Plan; Produce; Propose; Publish; Repurpose; Upload; Write
Affective Domain	Receiving	Developing awareness of ideas and phenomena	Ask; Follow; Reply; Accept; Prefer
	Responding	Committing to the ideas etc. by responding to them	Answer; Recite; Perform; Report; Select; Follow; Explore; Display
	Valuing	Being willing to be seen as valuing certain ideas or material	Justify; Propose; Debate; Relinquish; Defend; Initiate
	Organization and Conceptualisation	To begin to harmonise internalised values	Arrange; Combine; Compare; Balance; Theorise

	Characterization by Value	To act consistently with the internalised values	Discriminate; Question; Revise; Change
Psychomotor Domain	Perception / Observing	Here the student is simply observing the procedure	Observe; Listen; Detect
	Guided Response / Imitation	The student can follow instructions but needs to be instructed	Copy; React; Follow; Reproduce
	Mechanism	This is an intermediate stage where proficiency and confidence are growing	Organise; Manipulate
	Complex response	Proficiency has grown and performance is quick and accurate with little or no hesitation	The verbs are essentially the same as Mechanism, but modified by 'accurately' or 'quickly'
	Adaptation	The student has such ability that they can combine and integrate related aspects of the skill without guidance	Reorganise; Alter; Rearrange; Vary; Internalise

Benchmarking Against Disciplinary and Qualification Standards

To ensure quality and relevance, learning outcomes should be informed by established frameworks. Before drafting your programme's learning outcomes, it is good practice to explore examples from other institutions. A recommended source is the UK's Quality Assurance Agency for Higher Education (QAA). The QAA's *Subject Benchmark Statements* provide clear examples of outcomes. Their most recent (2025) statements also reflect important modern priorities, such as equality, diversity and inclusivity; Education for Sustainable Development, support for disabled students, entrepreneurship, and the growing impact of Gen AI. Table 4 show the QAA Benchmark Statement by subject. Furthermore, outcomes should align with the appropriate level of the Hong Kong Qualifications Framework (HKQF). The HKQF is a seven-level hierarchy designed to promote lifelong learning and enhance workforce quality. Its level descriptors include Knowledge and Intellectual Skills; Processes; Autonomy and Accountability; Communication, ICT and Numeracy.

Table 4. QAA Subject Benchmark Statements (QAA, 2025)

Subjects	**QAA Subject Benchmark Statements Links**
Accounting	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-accounting
Anthropology	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-anthropology
Architectural Technology	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/architectural-technology
Area Studies	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-area-studies
Business and Management (including Master's)	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-business-and-management
Classics and Ancient History (including Byzantine Studies and Modern Greek)	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/classics-and-ancient-history-(including-byzantine-studies-and-modern-greek)

Communication, Media, Film and Cultural Studies	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-communication-media-film-and-cultural-studies
Computing	https://www.qaa.ac.uk/quality-code/subject-benchmark-statements/computing
Counselling and Psychotherapy	https://www.qaa.ac.uk/quality-code/subject-benchmark-statements/counselling-and-psychotherapy
Creative Writing	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-creative-writing
Dance, Drama and Performance	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-dance-drama-and-performance
Earth Sciences, Environmental Sciences and Environmental Studies	https://www.qaa.ac.uk/quality-code/subject-benchmark-statements/earth-sciences-environmental-science-and-environmental-studies
Economics	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-economics
Education Studies	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-education-studies
Engineering	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-engineering
English	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-english
Forensic Science	https://www.qaa.ac.uk/quality-code/subject-benchmark-statements/forensic-science
Geography	https://www.qaa.ac.uk/quality-code/subject-benchmark-statements/geography
Health Studies	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-health-studies
History	https://www.qaa.ac.uk/quality-code/subject-benchmark-statements/history
Housing Studies	https://www.qaa.ac.uk/quality-code/subject-benchmark-statements/housing-studies
Land, Construction, Real Estate and Surveying	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-land-construction-real-estate-and-surveying
Languages, Cultures and Societies	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-languages-cultures-and-societies
Law	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-law
Linguistics	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-linguistics
Mathematics, Statistics and Operational Research	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-mathematics-statistics-and-operational-research
Music	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-music
Philosophy	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-philosophy
Politics and International Relations	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-politics-and-international-relations
Psychology	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-psychology
Public Policy and Public Administration	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-public-policy-and-public-administration
Theology and Religious Studies	https://www.qaa.ac.uk/quality-code/subject-benchmark-statements/theology-and-religious-studies
Town and Country Planning	https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-town-and-country-planning

A practical approach could involve the following process for drafting and refining your capstone learning outcomes:

- *Step 1: Define the Action with Precise Verbs*. Use strong, measurable verbs to provide clear structure. Avoid vague terms such as *understand, be aware of, be familiar with, or be interested in*. Instead, select verbs that describe an observable, assessable action (e.g., *analyse, design, evaluate, create*).

- *Step 2: Benchmark Against Your Discipline.* Align your capstone outcome with Programme Outcome and the Subject Benchmark Statements for your discipline. Identify two or three key outcome statements that reflect modern disciplinary priorities, e.g., GenAI or ESG.
- *Step 3: Align with the HKQF Level.* Review the HKQF level descriptors (e.g., Level 5 for Bachelor's) for "Autonomy and Accountability" and "Knowledge and Intellectual Skills." Ensure your outcome requires the appropriate level of independent judgment and specialised knowledge.
- *Step 4: Formulate a Holistic Outcome Statement*. Synthesise the previous steps into a single, comprehensive statement. Combine your chosen Verb with an Object that encapsulates knowledge from your discipline's benchmarks and requires the level of proficiency mandated by the HKQF. Ensure the final outcome reflects the capstone themes of values, skills, and attitudes.

3. The Measurement of the Capstone Strategies

3.1 Different types, dimensions, and assessments for capstones

Types of capstone curriculum

According to Lee & Loton (2017), six types of the capstone curriculum were found:

- *Externally oriented projects:* Students develop a professional solution for a real or simulated client, typically assessed through reports and presentations that demonstrate their process and final product.
- *Academic inquiry projects:* Students conduct structured, independent research or creative inquiry, producing a discipline-appropriate outcome like a thesis, portfolio, or presentation that mirrors postgraduate research.
- *Practice-oriented simulations:* Students are immersed in a complex, holistic recreation of a professional environment for an extended period, requiring them to manage workflows and pressures as if in a real-world setting.
- *Practice-based consultancies:* Students operate in an intensive, staff-managed consultancy that serves real clients, focusing on developing professional behaviors and processes rather than a standardised product.
- *Task-oriented simulations:* Students engage in a highly managed, paper-based or online simulation focused on achieving specific goals within a set of defined activities, often assessed through competencies and reflections.
- *Placements:* Students integrate academic and practical knowledge within a real workplace setting, typically accompanied by a critical inquiry or reflective component

that demonstrates competency and synthesis of learning.

The dimensions of the capstones:

According to the Healey et al (2013), the form that capstones take may vary along five key dimensions - conception, function, organisation, location, and nature of outputs.

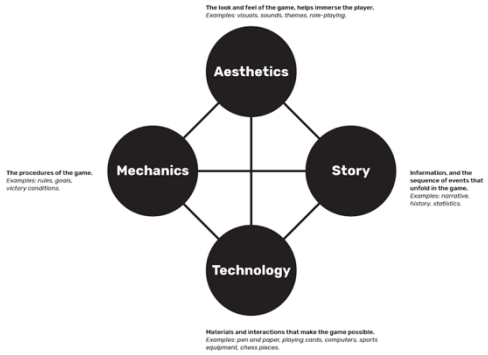
- *Conception:* Traditional projects and dissertations are usually independently undertaken academic research projects with a degree of choice being exercised by the student as to the topic, such as research projects, consultancy projects.
- *Function*: While dissertations typically prioritise in-depth analysis of a specific issue, capstone projects generally emphasise the synthesis of prior learning and its application to real-world, often professional, scenarios.
- *Organisation*: Many capstone projects utilise group work to manage larger cohorts and provide valuable experience in teamwork, often resulting in higher quality outcomes through collaborative effort and peer assessment.
- *Location*: Final Year Projects/Dissertations (FYPD) are increasingly adopting authentic, community and work-based learning experiences, a practice established in North America and UK, to better prepare students for the world beyond academia.
- *Nature of outputs*: While the traditional undergraduate dissertation remains a substantial, independent written thesis, there is a growing trend toward non-traditional, multimedia outputs due to digital innovation, a shift that is predicted to become the norm.

Different Types of Capstone Assignment

The design of contemporary capstones should integrate multiphase assessment models with sequential deliverables to deepen the learning process. This pedagogical strategy is essential in the age of AI, as it fosters continuous development, authenticates student effort, and cultivates the complex human-centric skills. This approach values and evaluates the entire journey of skill development, critical reflection, and collaboration, moving beyond a final output that could be aided by GenAI.

Table 8. Different types of assessment for capstones

Types of Assignment	**Description**
Presentation	This assessment allows students to demonstrate their communication skills and team-based knowledge of a design project, often supported by visual aids like slides.
Report	A report requires students to articulate their design understanding and process in writing, honing essential technical writing and teamwork skills for their future profession.

Poster Presentation or Display	A poster is a visual tool that facilitates an oral presentation, enabling students to clearly communicate their design project to an audience.
Responses paper	Response papers are assignments designed to help students engage with course concepts by summarizing readings, interpreting scientific discoveries or technologies, evaluating competing models, assessing strengths and weaknesses of tools or arguments, and applying new methodologies to class topics. They can be tailored to focus on understanding, critical analysis, or practical application. (Harvard University, n.d.)
Problem sets	Problem sets help students practice and master skills introduced in class, reflecting the scientific process through problem solving. They reinforce discrete skills with short, focused questions and develop higher-order thinking by combining skills to solve complex, real-world problems. Effective problem sets balance simple exercises with challenging, applied questions, often structured using Bloom's taxonomy. Collaborative work is encouraged for learning, while students should individually submit final answers to maintain academic integrity. (Harvard University, n.d.)
Final exams	Exams are common final assessments that help students synthesise and demonstrate their understanding of key concepts and skills from a course. They should be carefully designed to align with the most important course content and support student learning and reflection.
Podcasts	A podcast combines technical skills like recording clear audio and editing with storytelling skills such as conducting interviews and shaping a coherent narrative. Students should record in quiet places, use editing tools like Audacity or GarageBand, capture engaging stories and natural sounds, then arrange audio clips to create a meaningful story, using great podcasts as inspiration. (Harvard University, n.d.).
Games	Games engage players by letting them explore concepts through structured rules, sequences, and cause-effect interactions over time. Educational games build narratives where players learn by doing, experiencing concepts directly rather than through text. (Harvard University, n.d.). Figure 1. Components of Games (Harvard University, n.d.) 
Journal	A journal is a dated, ongoing record of project activities and financial details that also serves as a reflective log of a student's learning experiences
Peer/Self Review	This is an evaluation process where students assess their own performance and that of their teammates to encourage reflective practice and accountability

Portfolio	A portfolio is a carefully chosen collection of a student's work that demonstrates their progress, effort, and achievements over time. It requires students to gather, organise, revise, and reflect on their work, allowing them to actively engage in their learning and explain their investment in the course. Portfolios are commonly used in longer term capstones and arts and writing courses but can also apply to other fields (Harvard University, n.d.). Based on the finding of the study from Kwan & Lo (2023), the portfolio-based capstone project can: i) the consolidation of students' learning throughout the program; ii) professional identity development; and iii) enhanced reflexivity.
Oral reflection	According to Schön's theoretical framework (University of Hull, 2024) distinguishes between Reflection-in-Action, which occurs concurrently with practice, and Reflection-on-Action, which is a retrospective analysis of that practice. Oral reflection refers to students reflecting verbally rather than in writing. For example, Brennan & Gaul (2025) describe a capstone assessment where students submit a minimum of five paired "hot" and "cold" reflections each semester (Figure xx). At the year's end, they submit an ePortfolio and participate in a viva voce examination to reflect on their entire learning journey. Figure 2. Oral Reflection Journey (Brennan & Gaul, 2025) 

AI assessment

According to guideline, *students are allowed to use GAI tools to assist them in preparing assignments, assessments, and other educational practices, provided these tools are used ethically and responsibly, in accordance with the GAI Guidelines.* Therefore, instructors should clearly specify to what extent AI can be used in the process of planning, creating, and producing an assignment. The AI Assessment Scale (AIAS) was developed by Mike Perkins, Leon Furze, Jasper Roe, and Jason MacVaugh (2024). Table 9 shows some examples on different assignment tasks using AIAS.

Table 9. The AI Assessment Scale (Furze et al., 2024) with example for different capstones on different assignment tasks

Levels		Description	Assessment Task (example for Art Exhibition)	Assessment Task (example for social inequality topic)
1	NO AI	The assessment is completed entirely without AI assistance in a controlled environment, ensuring that students rely solely on their existing knowledge, understanding, and skills *You must not use AI at any point during the assessment. You must demonstrate your core skills and knowledge.*	Produce a handmade sketchbook journal documenting the conceptual development of your exhibition theme in a supervised studio session. Example: A student manually sketches ideas for an exhibition, drawing from personal observations and art history knowledge, without any digital or AI tools, and submits the physical journal.	Complete a final exam-style response paper on ethical considerations in social research, handwritten in a supervised setting. Example: A student writes an essay on research ethics for studying urban inequality, relying solely on memorised theories and personal reasoning, without external aids.
2	AI Planning	AI may be used for pre-task activities such as brainstorming, outlining and initial research. This level focuses on the effective use of AI for planning, synthesis, and ideation, but assessments should emphasise the ability to develop and refine these ideas independently. *You may use AI for planning, idea development, and research. Your final submission should show how you have developed and refined these ideas.*	Outline a portfolio structure for your exhibition, using AI only for initial research on art curation techniques, then refine independently into a detailed plan. Example: Draft an artist statement report for the exhibition, using AI for initial text generation and feedback, but critically revise for personal voice and accuracy.	Outline a research methodology portfolio, using AI for initial literature brainstorming, then refine independently. Example: A student uses GenAI to ideate on qualitative methods (e.g., querying "best practices for community interviews on social inequality"), outlines the portfolio, and independently refines it with specific adaptations, documenting the process.
3	AI Collaboration	AI may be used to help complete the task, including idea generation, drafting, feedback, and refinement. Students should critically evaluate and modify the AI suggested outputs, demonstrating their understanding. *You may use AI to assist with specific tasks such as drafting text, refining and evaluating your work. You must critically evaluate and modify any AI-generated content you use.*	Draft an artist statement report for the exhibition, using AI for initial text generation and feedback, but critically revise for personal voice and accuracy. Example: A student prompts GenAI to draft a statement on their theme, evaluates it, modifies to incorporate unique personal anecdotes, and submits the revised report with tracked changes highlighting their evaluations.	Draft a report section on findings interpretation, using AI for drafting and feedback, but critically revise for cultural sensitivity. Example: A student prompts GenAI to draft an analysis of inequality data, evaluates for oversimplifications, modifies with nuanced sociological perspectives, and submits with revision notes.
4	Full AI	AI may be used to complete any elements of the task, with students directing AI to achieve the assessment goals. Assessments at this level may also require engagement with AI to achieve goals and solve problems. *You may use AI extensively throughout your work either as you wish, or as specifically directed in your assessment. Focus on directing AI to achieve your goals while demonstrating your critical thinking.*	Design a poster presentation for the exhibition, directing AI to generate layouts and visuals, while overseeing and integrating them into a cohesive display. Example: A student directs GenAI to create poster elements (e.g., Generate a digital layout for an art poster), iterates on prompts for refinements, and assembles the final poster, submitting with a log of directives and critical decisions on aesthetic choices.	Create a poster display summarizing policy recommendations, directing AI for content and design, with oversight for relevance. Example: A student directs GenAI to generate poster visuals (e.g., Create infographics on urban inequality policies), iterates for accuracy, and assembles the display, including a log of prompts and critical evaluations.
5	AI Exploration	AI is used creatively to enhance problem-solving, generate novel insights, or develop innovative solutions to solve problems. Students and educators co-design assessments to explore unique AI applications within the field of study. *You should use AI creatively to solve the task, potentially co-designing new approaches with your instructor.*	Co-design an interactive oral reflection podcast episode exploring AI-generated art integrations in your exhibition, using AI creatively for novel content. Example: A student collaborates with the instructor to integrate GenAI for generating hybrid artworks (e.g., prompting AI to blend student sketches with digital variations), records a podcast reflecting on the process, and submits it with insights on innovative AI-art fusions and ethical implications.	Co-design an oral reflection on AI-assisted scenario modelling for social interventions, using AI creatively for insights. Example: A student collaborates with the instructor to use GenAI for simulating social policy outcomes (e.g., prompting Generate scenarios for inequality reduction strategies), reflects orally on novel applications, and submits a recording with discussions on ethical AI use in social science.

Use technology for Student learning

AI assessment tools in higher education offer features like automated grading, plagiarism detection, and personalised learning. These tools can streamline the assessment process, provide more efficient feedback, and help tailor learning experiences to individual student needs. Some useful AI assessment tools and their user guidelines can be found at: https://www.ln-tlc.info/.

Additionally, capstone courses normally require more collaborative work with students. Some tools can be useful for collaboration. For instance, Notion (https://www.notion.com/) is a versatile productivity app that supports notes, databases, wikis, calendars, and more. It enables collaboration across platforms and devices, allowing instructors to manage classes and promote teamwork, while students can organise their studies and work with peers. Miro (https://miro.com/) is an online collaborative whiteboard platform designed to enhance creativity and teamwork. For academic inquiry projects in capstones, tools like Mendeley (https://www.mendeley.com/), Zotero (https://www.zotero.org/), Rayyan (https://www.rayyan.ai/), and Covidence (https://www.covidence.org/) are valuable for managing references and conducting systematic reviews.

3.2 Rubric for different assessment

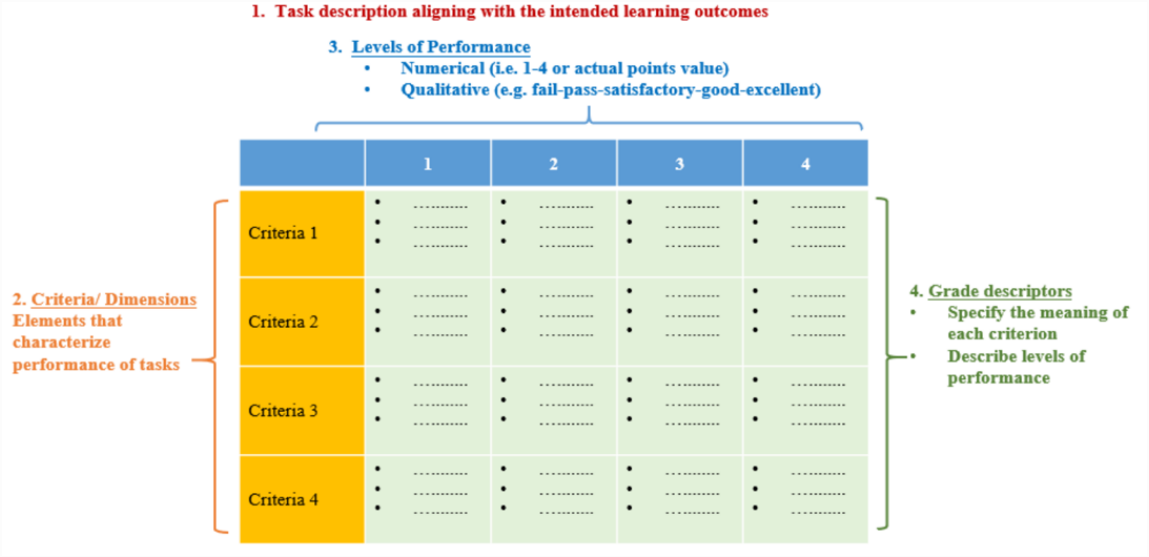
When creating a rubric for capstone assessment, it is essential to consider key guiding questions to develop an effective and aligned evaluation tool:

- What are the specific learning objectives of the capstone project?
- What are the critical criteria that accurately assess student achievement in relation to these learning objectives?
- What are the defined proficiency levels for each criterion? Can clear, observable indicators be listed to describe performance at each level?

Rubrics come in various forms, but a basic rubric generally consists of four essential elements (Figure 3, WGSQA, 2019):

- Task description: A clear statement of the task or assignment being assessed.
- Criteria or dimensions assessed (rows): These represent the elements or skills being evaluated.
- Levels of performance or mastery (columns): These outline different degrees of achievement, often ranging from novice to exemplary.
- Grade descriptors (cells): These provide detailed descriptions or indicators that define what each performance level looks like for each criterion.

Figure 3: Example on the composition of a typical rubric (WGSQA, 2019)



Generic skills rubrics

The Value Rubrics developed by the Association of American Colleges and Universities (AACU, 2009) offer 16 rubrics that assess a broad range of intellectual and practical skills at different developmental stages: benchmark, milestone, and capstone levels. The capstone level represents the highest standard of performance rather than the outcome itself. Table 10 shows these rubrics covered.

Table 10. Value Rubric based on different skills (AACU, 2009)

Skills	**Rubric**
Intellectual and Practical Skills	Inquiry and analysis
	Critical thinking
	Creative thinking
	Written communication
	Oral communication
	Reading
	Quantitative literacy
	Information literacy
	Teamwork
	Problem solving
Personal and Social Responsibility	Civic engagement—local and global
	Intercultural knowledge and competence
	Ethical reasoning
	Foundations and skills for lifelong learning
	Global learning
Integrative and Applied Learning	Integrative learning

Example Rubric for Capstone

These rubrics provide detailed frameworks that educators can adapt to assess the multifaceted skills demonstrated in capstone projects, ensuring comprehensive evaluation aligned with institutional and disciplinary learning objectives. Table 11 shows authentic examples of assessment rubrics. While they may not be perfect, they serve as practical references for your use (WGSQA, 2019).

Table 11. Sample Rubric for Capstone Project (WGSQA, 2019)

Indicator	Excellent	Good	Satisfactory	Pass	Fail
Interdisciplinary Work Target: The student makes multiple connections and conclusions across three disciplines during the Capstone Experience	The student demonstrates **deep** understanding of an issue from **multiple** disciplinary perspectives. During the defence, the student provides **rich** synthesis, analysis, and/or creativity from all **three** areas of study.	The student connects examples, facts, or conclusions from all **three areas** of study. During the defence, the student provides **good** synthesis, analysis, and/or creativity from all **three** areas of study.	The student minimally relates examples, facts, or conclusions from all **three areas** of study. During the defence, the student provides **minimum quality** of synthesis, analysis, and/or creativity.	The student minimally relates examples, facts, or theories **from at least one** area of study. During the defence, the student **lacks depth** of understanding and/or creativity for an issue from multiple perspectives.	The student does **NOT** relate examples, facts, or theories at a basic level. During the defence, the student **fails** to meet minimum BIS Department standards for synthesis and creativity.
The Capstone Project Experience/Report Target: The student identifies an issue, topic, or creative process and creates a capstone experience that shows a depth of understanding, learning, and involvement through a well-crafted written report	The student demonstrates **superior** understanding of an issue, topic, or creative process and creates a **powerful** Capstone Project Report using research, creative process, and/or community service.	The student demonstrates **high** quality understanding of an issue, topic, or creative process and creates a **good** Capstone Project Report using research, creative process, and/or community service.	The student demonstrates **minimum quality** of understanding of an issue, topic, or creative process and creates a **fair** Capstone Project Report using research, creative process, and/or community service.	The student demonstrates **minimum quality** of understanding for an issue, topic, or creative process and creates a Capstone Project Report that represents a **minimum** quality of work, creative process, and/or understanding.	The student does NOT demonstrate minimum quality or understanding for an issue, topic, or creative process. The Capstone Project Report fails to meet BIS Departmental standards and expectations.
Analysis/Results Conclusions, and/or Product Target: The student effectively analyses, summarises, or creates artifacts that demonstrate superior learning and/or creativity	The Capstone Project Report and/or product demonstrates sophisticated levels of understanding and application of the experience. The Capstone Project Report reflects superior learning and/or creativity.	The Capstone Project Report and/or product demonstrates strong levels of understanding and application of the experience. The Capstone Project Report reflects solid learning and/or creativity.	The Capstone Project Report and/or product demonstrates moderate levels of understanding and application of the experience. The Capstone Project Report reflects moderate learning and/or creativity.	The Capstone Project Report and/or product demonstrates a minimum level of understanding and application of the experience. The Capstone Project Report reflects basic understanding but lacks academic rigor.	The Capstone Project Report does NOT demonstrate a minimum level of understanding and application of the experience. The Capstone Project Report fails to meet minimum standards for academic rigor.

Indicator	Excellent	Good	Satisfactory	Pass	Fail
Grammar, Syntax, and Mechanics Target: The Capstone Project reflects highly skilled and cohesive writing of superior quality.	The student skillfully uses written language to communicate the purposes, procedures, and conclusions of the project. Stylistically, the writing flows coherently and fluently throughout the project and demonstrates a superior command of written communication.	The student uses written language effectively to communicate the purposes, procedures, and conclusions of the project. Stylistically, the writing makes sense, flows smoothly and demonstrates quality written expression.	The student uses written language effectively; however, committee members make frequently content and/or mechanical suggestions. Stylistically, the writing reads well and is free of obvious errors in grammar, syntax, and mechanics writing.	The student marginally uses written language in the project. Stylistically, there are many errors in cohesion, grammar, syntax, and mechanics. The committee expresses concern about the student's written language.	The student does NOT use written language for basic communication and expression. The Capstone Project is poorly written and unacceptable.
High Impact Practices Target: The Capstone Project provides evidence of a high impact practice as defined by LEAP. These include: (a) collaborative learning projects, (b) undergraduate research, (c) public performances, (d) diversity/global learning, (e) community engaged learning, (f) internships, or (g) intensive writing.	The student demonstrates LEAP High Impact Practices at Superior levels during the Capstone Experience.	The student demonstrates LEAP High Impact Practices at Strong levels during the Capstone Experience.	The student demonstrates LEAP High Impact Practices at Moderate levels during the Capstone Experience.	The student demonstrates LEAP High Impact Practices at Weak levels during the Capstone Experience.	The student does not demonstrate LEAP High Impact Practices during the Capstone Experience.

Sources:

The Hong Kong Polytechnic University: https://www.polyu.edu.hk/wgsqa/assessment-rubrics/rubrics-examples/
Charles Sturt University: https://www.csu.edu.au/division/learning-teaching/assessments/rubrics-and-marking-criteria/example-rubrics
Working Group On Subject Quality Assurance. (2019). Guide to Developing Rubrics for Assessments. The Hong Kong Polytechnic University. Retrieved from https://www.polyu.edu.hk/wgsqa/images/content/WGSQA_Rubrics-Manual-Full_Ver.1_20191101.pdf

4. Navigating from Theory to Practice (Best Practices)

This section outlines some samples for structuring the capstone experience, from setting clear, measurable outcomes and scaffolding the process to implementing multi-faceted assessment strategies that ensure both student success and the enduring value of the course. The examples provided are meant as a starting point for customization to fit specific disciplinary needs and institutional contexts, which demonstrate a range of possibilities for defining deliverables, integrated outcome-setting, scaffolding, and assessment into unique course setting.

Sample 1: Best example of business capstone course with GenAI

Table 12. Background, learning outcomes, assessment, and excerpt rubric of Sample 1 (Source: https://www.sydney.edu.au/units/INFS3600/2025-S2C-ND-CC)

Title: Business Information Systems in Practice					
Teaching Strategies: Reframing with GenAI in the Capstone					
Background					
This capstone unit bridges the gap between theory and practice by integrating knowledge and consolidating key skills developed across the Business Information Systems major. It aims to provide students with practical experience in identifying, analysing, and solving contemporary business problems. Much of this unit is dedicated to a problem-solving, experiential approach to learning. Students ensure their career-readiness by demonstrating their ability to apply concepts, theories, frameworks, methodologies, and skills to authentic problems and challenges faced in the field of information systems.					
Learning Outcomes					
LO1. apply and relate information systems theories and concepts in the context of an actual business problem with societal relevance LO2. analyse open-ended business scenarios and evaluate the implications of information systems decisions LO3. apply techniques for organisational and business process analyses to resolve an actual business problem LO4. communicate in a professional and confident manner, both orally and in writing, with actual business professionals LO5. apply team management concepts and theories to effectively work in, and manage, cross-functional teams LO6. analyse and reflect critically on the ethical and social implications of information systems.					
Assessment					
Individual progress report (multiple) *Written report* LO1; LO2; LO3; LO4; LO5; LO6					30% (AI allowed)
Generative AI Strategy *Plan and critically reflect on using GenAI and how it affects* learning. LO1; LO3; LO4; LO6					5% (AI allowed)
Reflective Journal *Individual, continuous, reflective learning journal, stimulated by prompts.* LO1; LO2; LO3; LO4; LO5; LO6					25% (AI allowed)
Group project presentation *In-class presentation of group work* LO1; LO3; LO4; LO5; LO6					5% (AI allowed)
Group assignment *Written report* LO1; LO3; LO4; LO5; LO6					35% (AI allowed)
Excerpt of rubric for creative work					
Criteria	Unacceptable	Acceptable	Meets Expectations	Exceeds Expectations	Exceptional
Artistic Composition in Storyboard	Fails to apply artistic principles.	Basic storyboard with minimal attention to details or stakeholder needs.	Storyboard is clear and visually engaging.	Creative and well-composed storyboard reflecting empathy.	Exceptionally creative storyboard with clear stakeholder focus.
Creative Process Documentation	No or poor documentation of creative process.	Minimal documentation of prompts, sketches, or iterations.	Well-documented creative process, showing iterative refinement.	Comprehensive and reflective scrapbook of process evolution.	Exceptional process documentation demonstrating novel insight.

GenAI Use	Improper use of generative AI tools or lacking acknowledgment.	Basic use of AI tools with limited documentation.	Thoughtful and transparent use of AI tools.	Skillful and innovative use of AI tools, documented clearly.	Exemplary use of AI tools, with deep critical reflection.

Implication:

Building on Ciriello & Vallis's (2025) findings regarding reframing with GenAI in the Capstone, this course establishes a forward-thinking educational model for the age of AI. It moves beyond prohibition to create a framework of accountable and critical engagement, thereby preparing students for the realities of the modern workplace. The redesign strategically integrates GenAI as a partner in creativity and problem-solving, and students use these tools for brainstorming, simulating, and prototyping on their projects while also receiving real-time feedback. Crucially, this is supported by innovative assessments like the GenAI strategy and viva voce, which shift the focus from penalizing use to evaluating critical thinking, originality, and the ability to leverage technology ethically. Therefore, this approach ensures that students develop essential human skills in analysis, reflection, stakeholder-focus design, transforming the capstone into a prototype for a post-AI workplace and advancing students' digital literacy for evaluative judgment in the GenAI era.

Sources:

Ciriello, R., & Vallis, C. (2025). From Compliance to Creativity: Teaching Problem-Reframing with GenAI in the Capstone. Retrieved from https://educational-innovation.sydney.edu.au/teaching@sydney/from-compliance-to-creativity-teaching-problem-reframing-with-genai-in-the-capstone/

Ciriello, R. (2025). Course Outline INFS3600: Business Information Systems in Practice Retrieved from https://www.sydney.edu.au/units/INFS3600/2025-S2C-ND-CC

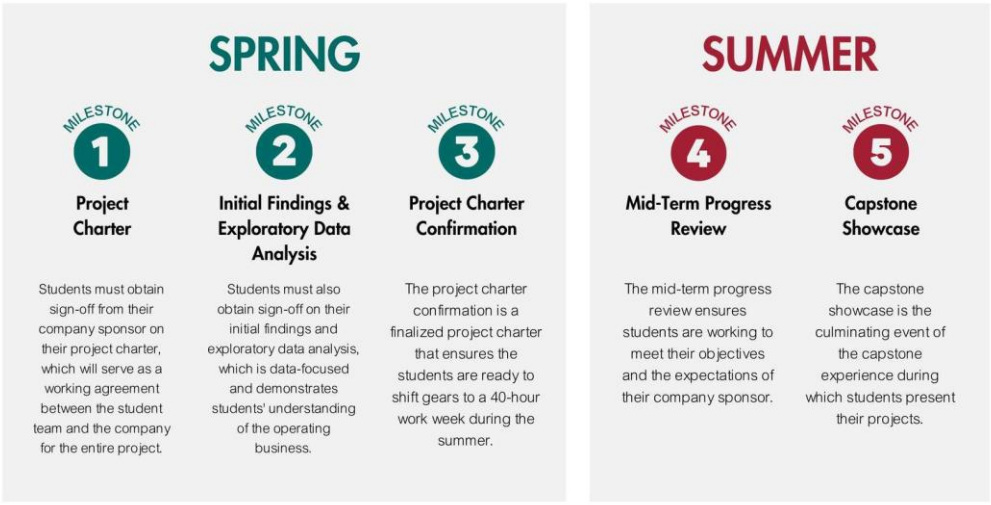
Sample 2: Best example of capstone showcase for tacking real-world data science challenge

Table 13. Background and deliverables of Sample 2
(Source: https://www.analyticscapstone.mit.edu/)

Title: MIT Sloan Analytics Capstone	
Analytics Capstone Showcase: real-world data and collaborate with industry partners	
Background	
The MIT Sloan Analytics Capstone Project is a rigorous, 7-month long course where teams of graduate students in the Master of Business Analytics (MBA) program collaborate with industry partners to solve real-world data science and analytics challenges. Working under faculty supervision, students apply advanced analytical techniques—including machine learning, optimization, generative AI, statistical modelling, and data visualization—to deliver actionable insights and strategic recommendations. The projects culminate in a final presentation and deliverable, providing sponsors with innovative, data-driven solutions while giving students valuable experience in real-world engagement and cross-functional teamwork.	
Students Deliverables	
Report: A comprehensive report of the problem, methods, and results.	• Describes the problem that was solved and the goals the student team aimed to achieve and explains why the problem is important, including the business impact for the host company • Describes the data used and the insights provided by the exploratory data analysis • Describes any hurdles encountered and steps taken to overcome or mitigate them • Describes the analytical methods used to solve the problem and the results obtained • Describes the deliverables the student team will hand over to the company and the

	transition plan put in place to ensure a smooth transition to the host company • Please note: because the final project report contains private, confidential data, it will not be released publicly
Presentation: A live presentation that focuses on the business impact of the project	• An 8—10-minute presentation by the student team • Covers similar topics to the report but focuses on the business impact of the project, avoiding technical details as it is aimed for a business audience • Presented during the live capstone showcase • Contains only public data that is reviewed by the host company
Video: A short video summary of the goal, methods, and key results.	• 1—2-minute video summary of the project compiled by the student team • Brief overview of the goal of the project, how the problem was tackled, and key results achieved • Contains only public data that is reviewed by the host company
Poster: A digital file that visually summarises the presentation topics	• Covers similar topics as the presentation • 24x36-inch vertical PDF file • Contains only public data that is reviewed by the host company

Milestones



Key dates

Feb	Capstone Matches Announced
Feb to May	Students work part-time (10 hrs per week per student)
Jun to Aug	Student work full-time (40 hrs per week per student) for a minimum of 10 weeks
Aug	Analytics Capstone Showcase

Implication:

The design of the MIT Analytics Capstone exemplifies a best practice in experiential learning by meticulously structuring a real-world, client-sponsored project into a rigorous, phased process. The extended 7-month timeline, transitioning from part-time to full-time work, is a critical feature that allows students to deeply immerse themselves in the problem, mirroring the iterative pace of a professional analytics engagement. The series of mandated sign-offs—on the project charter, initial findings, and mid-term review—ensures continuous alignment with the corporate sponsor's business objectives and fosters professional accountability. Furthermore, the multi-format deliverable strategy (comprehensive report, business-focused presentation, video, and poster) is a masterstroke in pedagogy; it compels students to not only develop technical solutions but also to master the crucial skill of tailoring their communication to diverse audiences, from technical teams to executive leadership. This holistic approach for the capstone course, which balances academic rigor with real-world business impact, ensures graduates are exceptionally prepared to deliver value in their professional careers.

Sources:
MIT Sloan school of management (Business Analytics) https://www.analyticscapstone.mit.edu/
MIT Analytics Capstone Project Guide https://rise.articulate.com/share/pOVgFJVcMzLFOaWEQtLu-YlRBDAnE3gU#/
MIT Analytics Capstone Project Overview https://mitsloan.mit.edu/sites/default/files/inline-files/MIT%20Analytics%20Capstone%20Overview%202021%20Public.pdf

Sample 3: Best example of experiential education project-based learning (EEPBL)

Table 14. Learning outcomes, main themes, and assessment of Sample 3 (Fang & O'Toole, 2023).

Title: Embedding sustainable development goals (SDGs) in business capstone	
Pedagogy: Experiential Education Project-based Learning (EEPBL)	
Background	
The capstone subject at the focus of this research, is a core final year business subject in a large public Australian University. As a non-exam assessment-based subject, students are expected to draw from prior knowledge and experiences gained from previously enrolled business subjects whilst attempting all the assessments.	
Learning Outcomes	
1. Develop skills for future employment in a sustainable, socially inclusive economy (LO1) 2. Develop the ability to work in a diverse multi-disciplinary team and use research skills and disciplinary knowledge to solve a complex business challenge. (LO2)	
Main themes	**Mapping to LO**
1. Awareness and knowledge of SDGs	LO1
2. Skills acquired through the learning of SDGs using EEPBL	LO1, LO2
3. Benefits of learning SDGs using EEPBL	LO1, LO2
4. Collaborative teaching of SDGs with industry partners	LO1, LO2
5. Develop a different perspective after learning SDGs	LO1
6. Understanding of their own agency in regard to implementing the SDGs	LO1
Assessments	

• Three group assessments
  ○ Project scoping assignment – 10%,
  ○ SDG project proposal assignment – 40%
  ○ Video presentation – 20%
• One individual reflective essay –20%
• group participation/discussion during class –10%
Students are put into groups set by the lecturer that ensured a good mix of gender, ethnicity and academic ability (based on previous academic results).	

Implication:

Based on the finding from Fang & O'Toole (2023), the example demonstrates that the Experiential Education Project-Based Learning (EEPBL) approach was highly effective in achieving the capstone's goals. The findings reveal that by collaborating on a real-world SDG problem, students dynamically synthesised their prior knowledge to acquire critical employability skills, including technical, soft, and research competencies. To effectively assess these multifaceted outcomes, the course utilised a balanced mix of group and individual assignments. The group projects (a scoping assignment, proposal, and video presentation) evaluated collaborative problem-solving and the application of knowledge, while an individual reflective essay ensured students critically analysed their personal learning journey. This deliberate alignment between the EEPBL pedagogy and its diverse assessment strategy

provided a comprehensive measure of student learning and offers a valuable blueprint for educators.

Sources

Fang, J., & O'Toole, J. (2023). Embedding sustainable development goals (SDGs) in an undergraduate business capstone subject using an experiential learning approach: A qualitative analysis. *The International Journal of Management Education*, *21*(1), 100749.

Sample 4: Best example of leveraging AI in simulations under strategic management capstone course

Table 15. Background and students feedback of Sample 4 (Stenard et al., 2024)

<table>
<tr><th colspan="2">Title: MBA Strategic Management Capstone Course</th></tr>
<tr><td colspan="2">Pedagogy: integrating business simulations and GenAI for deeper learning</td></tr>
<tr><th colspan="2">Background</th></tr>
<tr><td colspan="2">Students compete in small teams running companies that produce sensors, making decisions about the product offerings, marketing mixes, sales channels, operational investments, and financial management.

Students were asked to use GAI tools such as ChatGPT to see if it could assist with their understanding of, and performance in, the simulation competition. Queries might relate to strategy development, decision-marking and support, communications, learning and adaptability, data analysis and visualization, and problem solving.</td></tr>
<tr><th colspan="2">Assignment</th></tr>
<tr><td colspan="2">• Pre-test assignment, students learning the simulation was a discussion post. They were prompted to ask a question about their chosen GAI system. Then in the discussion post, they shared the specific question and their evaluation of the GAI response. After each student posted, they were able to view others' contributions.
• The post-test assignment asked for more details. And structured questions near the end of the course about their experiences with GAI throughout the simulation.</td></tr>
<tr><th colspan="2">Students' work and feedback</th></tr>
<tr><td>Reported ways of GAI uses by application and simulation function</td><td>• Strategic development (pre < post)
• Decision marking (pre ≈ post)
• Communication (pre < post)
• Learning and adaptability (pre < post)
• Data analysis and visualization (pre < post)
• Problem solving (pre < post)</td></tr>
<tr><td>Perceived help with understanding the simulation and business uses of GAI</td><td>• Over 60% of the students surveyed considered simulation somewhat or very helpful for understanding.
• Over 70% of student responses indicated that Business Use for GenAI was somewhat or very helpful for understanding.</td></tr>
<tr><td>Insights into whether GAI helped improved simulation performance</td><td>• When asked about GAI's help with business performance in finance, internal business processes, customers and learning, the student responses were very neutral, despite most students' reports that GAI use enhanced their understanding of the simulation.</td></tr>
<tr><td>Implications about the ethical use of GAI</td><td>• Ethical Concerns
• Perceived Benefits
• Fairness and Accessibility</td></tr>
<tr><td colspan="2">Overall: Students found GAI helpful for brainstorming, problem-solving, and pattern recognition. Decision-making provided insights rather than definitive answers, thereby fostering critical thinking and creativity. However, the ethical implications of AI use should be considered, along with transparency in its application.

A practical application of AI in education is demonstrated by Mercer University's Stetson-Hatcher School of Business. As noted by Stenard et al. (2024), they believe that encouraging students to "leverage AI to solve complex interdisciplinary problems in a controlled learning environment with defined end-state goals" will accelerate the pace at which they learn the new technology. Students in this MBA capstone course confirmed this value, stating that deploying AI in the classroom is "integral for real-world preparedness because it bridges the gap between classroom learning and corporate expectations."

To support this integration, Williams (co-author of Stenard et al., 2024) proposes that universities take three key steps in addition to using AI in capstones:
• Invest in AI infrastructure to provide students with access to technologies and databases that reflect current industry practices.</td></tr>
</table>

• **Provide mandatory, comprehensive AI training** on topics such as data security, ethical use, and practical business applications. This training demystifies AI and frames it as a standard tool rather than a potential avenue for dishonesty. • **Revise honour codes** to specify permitted AI uses and violations, giving students clear guidelines and empowering them to use AI without fear of unintended consequences.

Implication:

The design of the Strategic Management capstone, which integrates a business simulation with GenAI experimentation, establishes a best practice for preparing leaders for an AI-augmented business environment. This approach moves beyond theoretical discussion by creating a controlled, risk-free sandbox where students must actively leverage tools like ChatGPT to inform strategic decisions on everything from marketing to finance. The pedagogical approach lies in the mandatory pre- and post-test assignments, which foster a critical, evaluative stance towards AI outputs rather than passive acceptance. This process effectively cultivates higher-order skills, as evidenced by student reports of significant growth in strategic development, problem-solving, and data analysis. While GenAI was seen as an enhancer of understanding rather than a direct performance booster, it precisely achieved the course's deeper objective: to develop discerning judgment and critical thinking. By explicitly grappling with the ethical implications and accessibility of AI, the course design ensures graduates are not just technically proficient but also ethically prepared to harness GenAI as a strategic partner in leadership. Therefore, developing students' evaluative judgement is urgently needed, as proposed by Bearman et al. (2024), a process that includes developing evaluative judgement of GenAI outputs and processes, as well as employing GenAI to assess their own evaluative judgements.

Source:

Stenard, B., Sisk, F., Brennan, L., & Williams, G. (2024). *Teaching AI Skills Through Capstone Simulations.* Retrieved from https://www.aacsb.edu/insights/articles/2024/06/teaching-ai-skills-through-capstone-simulations

Stenard, B., Brennan, L., & Sisk, D. F. (2024). Leveraging Artificial Intelligence (Ai) in Strategic Management: Integrating Simulations and Generative Ai for Deeper Learning in an MBA Capstone Course. *Available at SSRN 5065259*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5065259

Sample 5: Best example of pedagogical design for leveraging GenAI

Table 16. Object, Criteria, and Deliverables of Sample 5 (Source: https://www.hack4sdg.com/)

Title: GenAI Hackathon for SDGs
Pedagogy: Hackathon competition
Background
Hackathon competition is to encourage the application and entrepreneurship of multimodal GenAI technologies towards socially beneficial purposes and the United Nations Sustainable Development Goals (UN SDGs).
Objectives
• Encourage capacity building for the responsible and ethical use of AI through creating real-world innovations towards social impact. • Foster students' 21-st century competencies, including communication, collaboration, creativity, critical thinking, and citizenship.

• Offer opportunities for multidisciplinary student networking and friendships within and across Hong Kong universities. • Promote a platform for education, entrepreneurship, mentorship, and start-up incubation towards a social innovation ecosystem.	
Criteria	
Convincing framing of problem (20%)	*Teams need to demonstrate that the problem is specific and well-defined, with evidence or research supporting its importance.* • Is the specific social issue and pain point clearly defined? • What evidence or research demonstrates this problem's significance and scope? • Who are the stakeholders affected by this problem, and how? • What existing solutions have been attempted and why have they been ineffective? • Does the project address the root causes rather than just symptoms? • Why does this problem deserve attention now?
Prototype/demo (20%)	*Team must demonstrate a functional prototype or demo illustrating the proposed solution in action.* • Does the demo effectively showcase the solution's core functionality? • How complete is the prototype (what works vs. what's simulated)? • Can the prototype handle realistic test cases? • How intuitive is the user interface/experience? • Has the prototype been tested with potential users?
Appropriate technical component (20%)	*Teams must show that GenAI technology is effectively and appropriately used for the problem.* • How specifically does the solution leverage GenAI capabilities? • Why is GenAI particularly suited for addressing this problem? • Which specific GenAI models or techniques are being implemented? • How does this approach improve upon non-AI alternatives? • What technical limitations exist, and how have they been addressed? • How efficiently does the implementation use computational resources?
Feasibility and impact (20%)	*Teams must convincing argue that the solution is realistic to implement and likely to make a meaningful social impact.* • What is the business model • Is the solution practically implementable given real-world constraints? • How will target users access and adopt the solution? • What metrics will measure impact? • What is the potential scale of impact (number of beneficiaries)? • What implementation challenges are anticipated? • Has the team developed a realistic timeline for deployment?
Sustainability and ethics (20%)	*Teams must show the solution is designed for long-term sustainability and state its ethical implications.* • Does the business model or plan support this solution long-term. • Is the solution scalable, adaptable, or has potential for integration with existing systems or processes • How will this project be financially sustained? • What potential ethical concerns (e.g. bias, privacy, and accessibility, unintended consequences) exist with this GenAI implementation? • How has feedback from affected communities been incorporated? • Does the solution empower users rather than creating dependencies?
Deliverables	
• Interim Reporting: Progress report clarifying the scope of your team's social problem and the preliminary idea to be developed. • Pitch Deck and Prototype Demo: Submission of pitch deck and any prototype demo (videos, application, technical links or files). Your pitch deck may include any relevant appendices. During the final presentation, you will have 5 minutes to pitch, followed by 5 – 7 minutes of Q&A. We will preload the pitch deck that you have submitted.	

Implication:

Based on the findings from Law et al. (2025), this GenAI Hackathon represents a best practice in pedagogical design because it effectively leverages GenAI as a transformative tool within an authentic, collaborative learning environment. By structuring the circumstance around a hackathon focused on real-world challenges, the design moves beyond theoretical AI literacy

to immerse students in practical human-human and human-AI collaboration. Crucially, the approach democratises digital solution-building; it empowers students of varying technical backgrounds by allowing them to use GenAI as a coach, collaborator, and productivity booster, thereby lowering barriers to creative problem-solving and privileging diverse perspectives over pure technical expertise. The success of interdisciplinary teams further demonstrates that the model effectively cultivates the hybrid intelligence and collaborative competences critical for the future workforce. Ultimately, this pedagogical design excels because it contextualises the development of AI and digital literacy within a meaningful, challenge-based scenario, fostering a holistic and deeply integrated learning experience.

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5. Conclusion

In conclusion, the era of GenAI necessitates a fundamental redesign of the capstone curriculum. Moving beyond the traditional model of a writing-heavy final project, an effective capstone must now integrate new learning outcomes with the focused-on AI literacy and human-AI collaboration. As argued, this requires a shift in pedagogical strategy, emphasizing in-class, hands-on activities and process-oriented assessments that value demonstration and critical thinking over a sole final product. By strategically incorporating these elements—aligned with OBATL principles and Graduate Attributes—educators can transform the capstone from a vulnerable culmination of past learning into a resilient, authentic bridge that truly prepares graduates with the skills needed to navigate in a complex, AI-powered world. Ultimately, a well-designed capstone is the crucial culminating experience that prepares students to become capable, reflective graduates.

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