Designing a capstone unit

The final year of their studies can provide an opportunity for students to bring together their knowledge and experiences and prepare them for the next stages of their careers, whether in further study or the workplace. Students can be supported to reflect on their whole program and make connections between the different, sometimes atomistic subjects. They can hone the graduate capabilities they will need and gather evidence of their learning to give them confidence for the transition.

There are several recent drivers for the introduction of capstone units at Macquarie:

- The University's development of graduate capabilities such as *critical thinking, problem solving, creativity and effective communication*, to be embedded in each program as part of the Curriculum Renewal Program.
- The University's Sustainability policy highlighting the importance of encouraging lifelong learning, with particular reference to work-integrated learning.

There is now a requirement that all students undertake a Participation unit. These Participation units can include work placements, internships, practicums and other work integrated learning experiences in business, industry or government, provided they are within the required academic framework, contain a structured process for documenting and reflecting on learning and are assessed.

The development of capstone units for each degree was seen as an opportunity to integrate all these requirements; to embed many of the graduate capabilities and participation requirements into final year units.

COMPONENTS OF A CAPSTONE UNIT

In one final unit of study within a degree it is important that students are provided with the opportunity to integrate the material covered in the course, understand how it fits together, and focus on how what they have learned equips them for their next step, whether this be to a next level of study, or into the workforce.

Components of such a unit of study therefore include:

- reviewing the scaffolding of the degree, including integrating major course material
- reflecting on the development of the graduate capabilities and how these have been achieved within the degree
- preparing a portfolio or diploma supplement; in professional degrees undertaking a professional preparation program

THE CAPSTONE TO CONSOLIDATE LEARNING

The design of students' learning experience across their program can be seen to be cumulative, from an induction into university learning in first year, through to a consolidation of learning in the final year as they prepare for their next transition. Typically, students will experience increasing and cumulative:

- complexity
- application
- ambiguity
- commitment to ideas
- authenticity
- collaboration
- critical, self-reflexive evaluation

DESIGN CONSIDERATIONS

1. KNOWLEDGE, SKILLS AND CAPABILITIES

Developing a capstone unit provides a great opportunity to take a whole of program approach to curriculum design. The intention of a capstone unit is for students to consolidate their learning from the previous units of study, rather than learning new content. In your preparation for designing a capstone unit, consider the knowledge, skills and capabilities you expect students to have acquired and to be able to demonstrate in their transition. You may need to work with those delivering other component of the program to ensure that these have been addressed.

Some typical aspects of learning outcomes of capstone units are:

- appreciation of complex, competing issues in graduate jobs
- extension of analytical and strategic thinking
- application of theory into practice
- development of career networking capabilities
- consolidation of higher-level applied communication skills (written, oral, interpersonal, professional presentations)
- application of employment-related teamwork
- demonstration of early professional dispositions and ethical stance

2. PROFESSIONAL AND INDUSTRY LINKS

Draw upon existing industry links and partnerships to enhance the design of the capstone Unit. While students may move in a diverse range of directions after their program, this input can help ensure that they are well prepared and the learning outcomes are authentic.

The design of the capstone may also include some experience in a professional or industry setting which can benefit the students by enabling authentic learning and also help in establishing and extending collaborative relationships with major employer organizations. Exploring the types of work your graduates seek may help here.

3. SCAFFOLDING DURING THE UNIT

Both the process and the product of the program are important in capstone units. Students will be required to draw on the learning from their whole program of study to produce a final outcome, but they may need some support in doing this. Plan how you will:

- Facilitate students' development of realistic and feasible topics. Guidelines on the types of projects they could undertake and opportunities to discuss their ideas may help them refine their ideas

- Guide students' development of plans for achieving their outcomes. Guidelines and templates may help students understand what is required to complete their project or report

- Assist students in working effectively in a team, if required. Many students will need help in collaborating with their team members over a major project if this is required. Some strategies to help them resolve difficulties and procedures for dealing with issues in the team should be established early in the unit

- Provide feedback on their progress. By structuring the assessment of the capstone unit

- Around the submission of several smaller pieces staged through the semester, students can have the opportunity for formative feedback on each stage to ensure they are on the right track

- Minimize and manage risk associated with students' participation in authentic professional and industry settings. Ensure that you have administrative processes in place, such as occupational health and safety, insurance, and intellectual property)

4. ASSESSMENT

The assessment of a capstone unit can take many forms, for example:

- a case study based on a 'real-world' situation

- a research grant proposal or plan based on an authentic professional or industry need

- a feasibility study report on a proposed initiative addressing issues of relevance to a particular professional or industry need

- a research report on the project conducted through the capstone unit

- a plan for the development and implementation of a program of activities for an authentic

- professional or industry setting

- a series of communiques and presentations addressed to those working in the authentic

- professional or industry setting of the capstone project work

- an integrative portfolio of the student's key learning outcomes from the program

Keep in mind that the assessment tasks can focus on both the processes used in the unit and the final product. For example, some of the MQ examples attach assessment to the development of group work skills demonstrated during the unit as well as the final report.

The Assessment toolkit item 'Assessing final year students' has more detail about how to design assessment in capstone units.

5. TECHNOLOGIES TO SUPPORT ASSESSMENT

There are a range of technologies available to help capture both the learning process during the unit and the final products. The examples of good practice include the use of technologies to:

- Support the **scaffolding** of student learning regardless of the learning context or the time. Examples include the resources, housed on the unit LMS site, to guide students in planning their projects, formatting their final reports, resolving conflicts or negotiating within their teams. Some units include readings, articles or examples of good practice. Rubrics for grading criteria can be made available early in the semester and used to provide feedback during the process.

- Support **socially constructed learning** by providing a web-based space for dialogue in dispersed environments. Examples include the use of the LMS discussion tool to provide a forum for communication between and across teams. The asynchronous nature of these tools can be especially helpful when students are working in industry-based contexts and may feel isolated from their teachers and peers. Students don't need to fit in with a predetermined schedule to discuss issues, ask questions or share ideas.

- Document **collaboration processes** for example wikis for capturing individual contributions to group work. Time to meet is a typical drawback of group projects. Technologies such as wikis enable students to work collaborative in dispersed environments. Virtual meeting environments could also be used to meet this need.

- Chronicle the **learning journey**. Examples include the capturing of students' reflections in blogs or individual learning journals.

- Store **learning artefacts** in portfolios for storing and sharing assessment products. Examples include digital portfolios to house the various stages of the project for collecting formative feedback, or showcasing the final products for the marker, peers and potential employers.

CAPSTONE UNIT DEVELOPMENT CHECKLIST

Capstone units provide an opportunity for final year students to make sense of their learning across their whole program of study.

In designing a capstone unit, it is important that students are provided with the opportunity to integrate the material covered in the course, understand how it fits together, and focus on how their learning equips them for their next step, whether this be to a next level of study, or into the workforce.

This checklist has been developed to provide a list of considerations when designing your unit. There is also information available in the Learning and Teaching Centre's *Assessment Toolkit item Assessing final year students – capstone units.*

See checklist below

Designing the learning and teaching outcomes	The outcomes are designed to support students in reviewing what they have learned over their whole degree.
	There is little or no new content delivered as part of the unit.
	Opportunities are provided for students to develop graduate capabilities such as team work, communication and creative problem solving.
Professional or industry links	If appropriate, the needs of the students in the next phases of their careers have been considered in the design of the unit. Examples include authentic learning experiences in workplace contexts.
	Management strategies have been considered for risks associated with student participation in authentic learning, for example OH&S for professional or industry settings.
Scaffolding during the unit	Students are guided in integrating and synthesizing knowledge from multiple and diverse topic areas.
	Time is built in to the unit for students to develop realistic plans for the projects or tasks required.
Designing the assessment	Tasks require self-reflection to help students consolidate their understanding of learning processes.
	Assessment requires students to apply knowledge to an unstructured, authentic problem.
	Students are assessed on the basis of their capacity to use the knowledge and skills they have acquired during their program, rather than on the acquisition of new content.
	Assessment tasks encourage students to capture and present evidence of their graduate capabilities, such as communication skills.
	Tasks are designed to be both formative, providing for student development during the unit and summative.
	Students contribute to the planning of how their learning will be assessed, for example through choosing how the final output will be presented or delivered, or the weighting of criteria.

REFERENCES AND RESOURCES

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