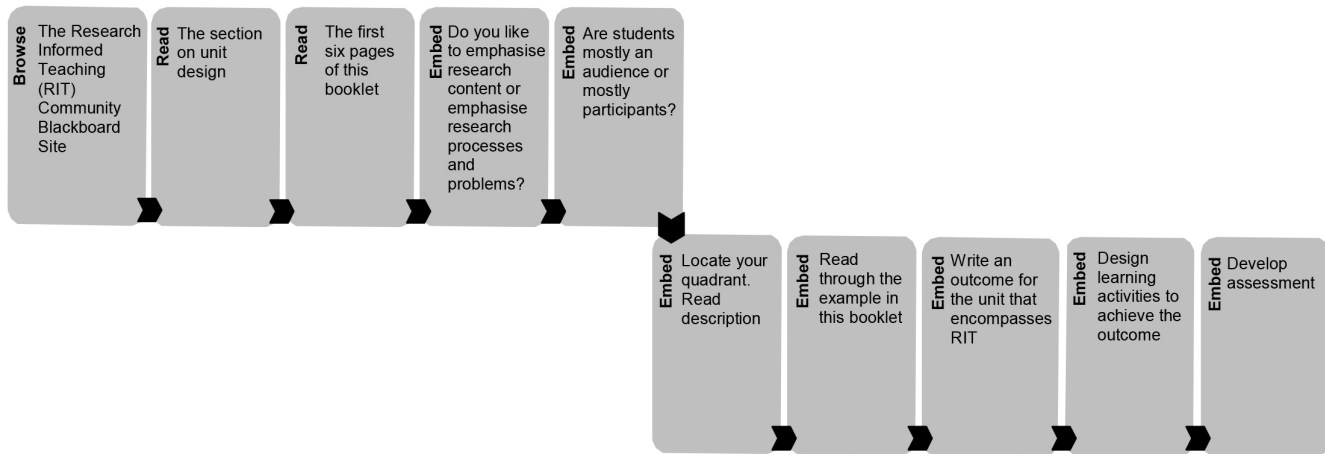


# Embedding Research Informed Teaching

This resource is designed to assist you with implementing Research Informed teaching into a unit.



## Background – What is it about?

Research Informed Teaching at ECU aims to bring the two key functions of a University (research and teaching) closer together. It may involve:

- students learning about others' research;
- students learning to do research;
- students learning about their discipline in research or inquiry mode; and/or
- research that informs staff about their teaching.

Well designed, these activities assist students to understand the role of research in learning and how knowledge is constructed and produced within their discipline. This creates a bridge between teaching and research for teacher and student.

An effective RIT approach means that all students – not just research students – will develop the skills of critical inquiry, such as critical appraisal, reflection and analysis, problem-solving, and the ability to apply evidence-based solutions.

This RIT guideline describes a learning and teaching strategy aimed at enhancing learning in disciplines as a means to an end, not as an end in itself. As a first step in meeting this teaching and learning challenge, a model of Research- Informed Teaching for ECU has been developed that links:

- Disciplined-based teaching;
- Disciplined-based research; and
- the scholarship of teaching and learning.

The model serves as a basis for the development of a coherent approach to Research-Informed Teaching as well as serving as a focus for evaluation. The model is summarised in the following diagram (more information is available from the fact sheet):

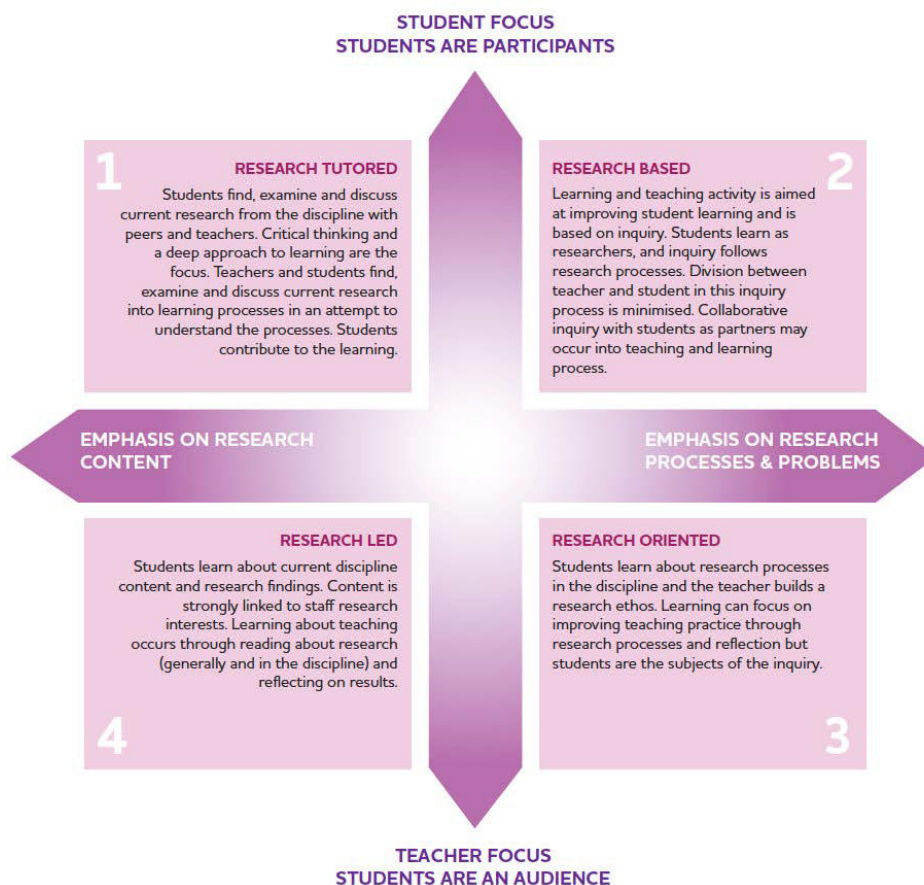


Figure 1: A RIT model incorporating teaching and learning approaches

## Key Features of RIT

1. RIT can enhance discipline-based learning.
2. The above diagram describes four different approaches that can be adapted to existing teaching approaches. Adoption of any of the four approaches will result in RIT being part of a unit.
3. Every approach involves some aspect of researching and improving teaching practice.
4. RIT may not be appropriate for every unit or every teacher.
5. Teachers may choose any of the four approaches.
6. It may be necessary, but not mandatory, to add an extra outcome to unit or course outcomes to encompass RIT.

## Unit Design to Incorporate RIT

“Many of the concepts and most of the examples used here are from the work of Mick Healey. The diagram used is adapted from his work. We thank him for leading the way in this area”.

Healey, M. (2005). Linking research and teaching: Exploring disciplinary spaces and the role of inquiry-based learning. In R. Barnett (Ed.), *Reshaping the university: New relationships between research, scholarship and teaching* (pp. 67-78). Maidenhead, UK: Society for Research into Higher Education and Open University Press.

Learning activities for units could include those that develop discipline knowledge and enable students to develop an appreciation of the culture of research with its questioning, critical thinking and reasoning elements.

Units need to be developed with regard to the overall course so that the course is an holistic, coherent learning journey that maps students' experiences with RIT progressively and developmentally across year levels.

The following are examples of how RIT can be embedded in courses and units and are grouped according to the above framework.

## Research-Tutored: Engaging in Research Discussions

Engaging in discussion is a key way to develop understanding. Traditionally in higher education this takes place through staff-led academic tutorials and seminars. It can occur in other ways – by:

- Allowing students to do primary research from first year;
- Engaging students with an online community;
- Designing activities so that students work collaboratively on the analysis of an international journal article;
- Asking students to devise a question for the author of a research article and email that question;
- Developing an activity that involves students in critical analysis of the research literature on a topic;
- Designing learning activities that are inquiry-based, problem-based and that incorporate authentic learning experiences; and
- Setting assignments that require students to engage in research processes like locating, collecting, referencing, critiquing, applying evidence, challenging assumptions, questioning, and interpreting.

## Educators can investigate their own teaching by:

- Conducting research into how students learn to make evidence-based decisions about their learning;
- Demonstrating an innovative teaching method or approach that draws on evidence-based inquiries into learning and teaching and then asking students for their feedback; and
- Engaging in reflective teaching practice by asking students to critically reflect on a teacher's teaching and learning. Incorporating students' feedback into a subsequent lecture can then close the feedback loop.

## Research Based

Learning activities can be designed that enable students to develop knowledge and research skills by learning in 'enquiry' mode rather than being the recipients of teacher- processed knowledge. These activities could include inquiry-based, problem-based and authentic learning experiences. "Probably the most obvious way for undergraduate students to engage in research is to undertake final year dissertation or capstone research and inquiry projects" (Healey & Jenkins, 2010).



Other ways include:

- Setting assignments that require students to engage in research processes like locating, collecting, referencing, critiquing, applying evidence, challenging assumptions, questioning,

and interpreting;

- Making explicit to students the vital connection between research and learning;
- Co-producing knowledge with students and lecturers in inquiry-based settings;
- Giving students the opportunity to gain experience in applied research through work-based learning opportunities or similar practical activities;
- “Using inheritance: each year students receive a body of work produced by the previous group of students and make improvements and additions to it; this process can be repeated until publishable materials are produced” (Chang, 2004)
- Allowing students to participate in a live virtual conference; and
- Getting students to work in small groups to conduct research and eventually to publish their findings as an assignment.

## Research Oriented

“Assisting undergraduates to develop research skills and techniques is a key aspect of the intellectual journey of students as they develop as researchers.” (Healey & Jenkins, 2010). Course lectures, practical and laboratory classes and course work are common modes of teaching in which research skills and techniques are particularly emphasised.

Other ways of teaching include:

- Developing a practical exercise that engages students in making observations; coming up with questions; sharing questions with another group of students; coming up as a group with hypotheses based on the question; thinking of ways of testing the hypothesis; and writing up individually their questions and an hypothesis as a mini-proposal for a research project;
- Dealing explicitly with some of the common questions, concerns and practical issues that undergraduate students
- face when planning a piece of social research;
- Developing students’ skills for inquiry-based learning and embedding them in a module;
- Getting students to inquire into and develop a proposal;
- Auditing and developing student research skills; and
- Adapting assessment tasks explicitly and systematically to develop student research skills.

## Research Led

Students can be engaged with current research in a discipline in a variety of ways, including through lectures, laboratories, course work and seminars led by academic staff.

Other ways include:

- Explicitly introducing students to reading and to writing as researchers;
- Developing a set of exercises that assists students to consider the structure of a scientific report and read and evaluate a given research paper;
- Asking students to interview a member of academic staff about their research and write a report;
- Allowing School researchers to present current work to students of all years in a conference style format; and
- Inviting speakers from a variety of potential research employers and asking them to present.

# How to Embed RIT in a Unit

## Decide Upon General Approach

1. Decide, in general for your planned unit, if you would mostly like to emphasise research content or emphasise research processes and problems. Look back to Figure 1, above. Are you to the left or right on the horizontal axis?
2. Decide, in general for your planned unit, if students are mostly an audience (teacher is the focus in the learning activities) or students are participants (they are the focus in the learning activities). Locate yourself on the vertical axis in Figure 1.
3. Now, with these answers in mind locate in which quadrant (1,2, 3 or 4) your unit is located. Read the accompanying description and decide if it fits with where you want to go.

### Happy?

Then the description will give you an idea about the general approach to learning in your planned unit

### Not happy?

Repeat the above or read the description for each quadrant until you find the best match to your planned unit.

## Example

A lecturer in Nursing is revising a unit. She wants her students to implement evidence-based approaches as part of their normal practice after they graduate so she wants them to be familiar with current discipline content and research findings. This means she is on the left in Figure 1 – emphasis on research content.

Currently the unit is very educator focussed – a traditional approach using lectures and tutorials but she wishes to make the unit more student centred. So she is above the line in Figure 1 – student focus, students are participants.

So her general approach to embedding RIT is outlined in quadrant 1:

Students find, examine and discuss current research from the discipline with peers and teachers. Critical thinking and a deep approach to learning are the focus. Teachers and students find, examine and discuss current research into learning processes in an attempt to understand

Note that there is an element of investigating her own teaching, utilizing student input, outlined in the above general approach

## Write an Outcome for the Unit that Encompasses RIT

Having now decided upon the general approach then existing unit outcomes may have to be modified to incorporate RIT or a new outcome may have to be written.

### From the Fact Sheet:

Learning outcome statements should be general enough to capture important learning, but clear and specific enough to be assessable.

- Think about:
- the information or content you want students to learn;
- what you want them to do with that information;

- the skills they would need in order to do that;
- the levels of thinking you want them to engage in; and
- how you want them to be able to articulate or demonstrate their learning.

Learning outcome statements should specify an observable behaviour. Each outcome statement should contain:

- an action word that identifies the performance to be demonstrated;
- a description of the learning; and
- a broad statement indicating the standard of performance.

Bearing all the above in mind the teacher generated the following additional outcome for her unit:

After reviewing and discussing this outcome with other educators her next step was to design learning activities to achieve this outcome.

## Design Learning Activities to Achieve the Outcome

### Activities

Here are some ideas for activities that can be adapted for each of the four general approaches. They are suggestions for activities that can be used as prompts to help you design your own activities in line with your general approach.

- Bring data and findings from current staff research into the curriculum
- Develop students' research skills (explicitly, in addition to other disciplinary and generic skills)
- Develop students' appreciation of research in the discipline
- Use assignments that involve elements of research processes (e.g. literature reviews, bidding for grants, drafting bids or project outlines, analysing existing project data, presenting at a 'conference')
- Use teaching and learning processes that simulate research processes (e.g. project-based modules, dissertation modules, problem-based learning)
- Give students the opportunity to work on research projects alongside staff (e.g. as a research assistant)
- Give students first-hand experience of commercial consultancy (e.g. as an 'intern', as work-based learning, as a consultant assistant or as a supervised consultant)
- Illustrate ideas, concepts and theories with research examples from your discipline.
- Design learning activities around contemporary research issues.

### The Activity

In our example the lecturer had decided upon a research – tutored approach and has written the following outcome related to this general approach:

Students develop a greater understanding of: Breastfeeding;  
Immunization; and

The role of complementary approaches

in regard to infant health through critically reading, examining and discussing current research.

She then designed three activities delivered over three weeks that would enable her students to achieve that outcome.

The first activity related to one of the suggested activities above: "Students work collaboratively on the analysis of an international journal article".

She placed the students into groups and then gave each group a different, contemporary research article on human lactation. She asked each group to critically analyse each article. In particular they had to comment on the research methods and techniques used. Each group had to then present their evaluation of the credibility of the articles' findings.

Following this activity the teacher then designed two other activities that required students to locate, collect, reference and comment on two other similar articles. The final activity asked students to critique and challenge any inherent assumptions in their articles.

These three activities effectively built students' skills and culminated in an assignment that required them to combine each separate activity into a coherent document that critically analysed the literature. This assignment allowed her to assess whether the outcome had been achieved.

## Assessment

One purpose of writing a clear outcome is that it allows the outcome to be reliably and validly assessed. In the assessment scheme for your unit there should be a clear link between the objective written and the assessment conducted. In addition the outcome, activity and assessment should all be aligned to form a cohesive learning package.

## Other Comments

Implicit in the design task above is that the teacher will only design a task for which adequate resources are available. This means that there is adequate time, equipment and that both educator and student have the requisite skills to experience success with the task.

Task design is a subset of learning design, a topic which has its own research and intellectual traditions. Learning design is an interesting and involved subject so if you are interested in really developing your unit into a fully learning designed unit then please contact any of the Learning Designers within CLT ([clt@ecu.edu.au](mailto:clt@ecu.edu.au)) They will assist you in developing your unit in accordance with any of the well known learning design models, all of which involve outcomes, tasks, resources and assessment – as well as many other elements.

It is important that you become familiar with the resources available from the RIT community site. What is presented here is a terse summary and as you discover more about this topic and the advantages of incorporating RIT into teaching then the resources at the site will become even more relevant.

Please contact Centre for Learning and Teaching for any assistance ([clt@ecu.edu.au](mailto:clt@ecu.edu.au))

## References

- Chang, H. (2007). Turning an undergraduate class into a professional research community. *Teaching in Higher Education*, 10 (3), pp. 387-394. doi:0.1080/13562510500122339
- Healey, M. (2005). Linking research and teaching: Exploring disciplinary spaces and the role of inquiry-based learning. In R. Barnett (Ed.), *Reshaping the university: New relationships between research, scholarship and teaching* (pp. 67-78). Maidenhead, UK: Society for Research into Higher Education and Open University Press.