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1. Background – What is it about?

Research Informed Teaching (RIT) at Ada, The National College for Digital Skills aims to bring the two key functions research and teaching closer together for the Degree Programme in Digital Innovation. 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 studying for the degree award 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, demonstrating the different kinds of links between research and teaching is used.

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 which is adapted from the work of Mick Healey ¹. Many of the concepts used here are also from the work of Mick Healey who leads the way in this area.

¹ 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.

**STUDENT FOCUS
STUDENTS ARE PARTICIPANTS**

1

RESEARCH TUTORED

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 the processes. Students contribute to the learning.

2

RESEARCH BASED

Learning and teaching activity is aimed at improving student learning and is based on inquiry. Students learn as researchers, and inquiry follows research processes. Division between teacher and student in this inquiry process is minimised. Collaborative inquiry with students as partners may occur into teaching and learning process.

**EMPHASIS ON RESEARCH
CONTENT**

**EMPHASIS ON RESEARCH
PROCESSES & PROBLEMS**

4

RESEARCH LED

Students learn about current discipline content and research findings. Content is strongly linked to staff research interests. Learning about teaching occurs through reading about research (generally and in the discipline) and reflecting on results.

3

RESEARCH ORIENTED

Students learn about research processes in the discipline and the teacher builds a research ethos. Learning can focus on improving teaching practice through research processes and reflection but students are the subjects of the inquiry.

**TEACHER FOCUS
STUDENTS ARE AN AUDIENCE**

A RIT model incorporating teaching and learning approaches

2. 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 module.
3. Every approach involves some aspect of researching and improving teaching practice.
4. RIT may not be appropriate for every module or every lecturer.
5. Lecturers may choose any of the four approaches.
6. It may be necessary, but not mandatory, to add an extra outcome to module outcomes to encompass RIT.

3. Module Design to Incorporate RIT

A ‘traditional’ approach to module delivery may focus on research-lead teaching at Level 4 (Year1), research-oriented learning at Level 5 (year2), and a research-based learning (largely on the final year project) at level 6 (Year3) of the degree programme. Yet, if a student is not exposed to research-based teaching in the earlier years of the programme, they will not be adequately prepared for their final year and their project/dissertation. Hence, the optimal model should include a balanced mixture of the four RIT links.

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;
- 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:

- 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;
- Giving students the opportunity to gain experience in applied research through work-based learning opportunities or similar practical activities;
- Allowing students to participate in seminars; 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 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 proposal for a research project;
- Developing students' skills for inquiry-based learning and embedding them in a module;
- Getting students to inquire into and develop a proposal;

- 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 staff 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.

4. **How to Embed RIT in a Module**

- **Decide Upon General Approach**

1. Decide, in general for your planned module, 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 module, 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 module is located. Read the accompanying description and decide if it fits with where you want to go.

If the description fits, then the description will give you an idea about the general approach to learning in your planned module.

If the description does not fit, read the description for each quadrant until you find the best match to your planned unit.

- **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.

Learning outcome statements should be general enough to capture important learning, but clear and specific enough to be assessable. In setting learning outcomes the following must be considered:

- 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.

- Design Learning Activities to Achieve the Outcome

Learning activities for modules 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.

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, drafting project outlines, analysing existing project data).
- Use teaching and learning processes that simulate research processes (e.g. project-based modules, dissertation modules, problem-based learning).
- Give students the possible opportunity to work on research projects alongside staff.
- Illustrate ideas, concepts and theories with research examples from your discipline.
- Design learning activities around contemporary research issues.

- 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 module, 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.

5. General Practical Advice on Developing RIT

- Involve students in a current research project by providing data you have collected for them to analyse, sharing papers for discussion which you are using for your research, or by offering work/training placements as research assistants.
- Encourage students to work on real-life research projects at the university or with external partners as part of their dissertation or a work-based learning module.
- Run a mini-conference for undergraduate students to share their research/project findings. Ask staff members to produce posters about their research for display at the event. Invite external speakers or guests to the conference to showcase student work.
- Encourage students to submit high quality research work to one of the student journals. Consider submitting jointly authored papers with your students to peer-reviewed publications.
- Use the findings of previous undergraduate research in your teaching of subsequent cohorts. This helps students appreciate how research progresses incrementally, and motivates them in their research.

References

Chang, H. (2007). Turning an undergraduate class into a professional research community. *Teaching in Higher Education*, 10 (3), pp. 387-394.

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.