Handbook for
Research Skill Development
and Assessment in the Curriculum

RSD

Research is a doorway...

A Handbook for

Research Skill Development
and Assessment in the Curriculum

'Research is a doorway, opening onto a whole new outlook on the world…'
(Willison, Peirce & Ricci, 2009)

'… it inspires something in you that makes you want to find out things.'
Student reflecting on researching during a First Year course.

I am neither especially clever nor especially gifted. I am only very, very curious.
--Albert Einstein

Research Skill Development and Assessment in the Curriculum: Examples from Several Disciplines

Research Skill Development Handbook
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About this Handbook

This handbook demonstrates how academics have developed and assessed students' research skills in content-rich courses from First Year undergraduate to Masters level. It contains a collection of assessment tasks that are used to diagnose, develop and track student research skills in undergraduate and masters coursework. These are produced by lecturers in Health Science, Engineering, Science and the Professions and are all informed by the same theoretical model- the Research Skill Development (RSD) framework (pp 6-7). A brief rationale for the RSD is given on pages 3-5.

Each discipline, each different context, and each specific assessment requires tailoring the RSD in ways that are appropriate and meaningful to the task. The RSD has inspired not only marking criteria, but also, in some cases, fresh ways to see the purposes of coursework and the role of assessment. The intention of this handbook is to provide inspiration about ways to facilitate student research skill development in coursework by using these specific examples from a variety of disciplines. Each is available at www.adelaide.edu.au/clpd/rsd, and may be downloaded in word format and adapted to your context.

The courses listed in the handbook represent a selection of the 28 courses that have been trialling and evaluating RSD approaches since 2004. An ALTC-funded project, completed in December 2009, showed substantial positive benefits to the explicit development of student research skills across 10 diverse courses.

- Student self-assessment showed statistically significant increases in specific research skills across all courses.

- Academics' assessment of student work also demonstrated substantial improvements

- Ninety per cent (90%) of students interviewed stated that the research skills they developed during RSD-based courses were useful for employment, and 75% indicated that they were useful in subsequent study.

See www.adelaide.edu.au/clpd/rsd/study and Appendix 5 for details of this research.

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Rationale for the Research Skill Development framework

Undergraduate education and university research

Undergraduate education has historically been seen in conflict with academics' research agenda (Lane, 1996; Sample, 1972). Boyer's revolutionary reconceptualisation of scholarship, motivated by a concern to 'break out of the tired old teaching versus research debate' (Boyer 1990, p. xii) has suggested possibilities other than that seemingly entrenched 'truth' of research and teaching as necessarily competing endeavours. In this view, teaching and research are not perceived as being in opposition, but rather, as inextricably linked with one other (Brew, 2006).

Within this paradigm, students are perceived as researchers who 'observe and participate in the process of both discovery and communication of knowledge' (The Boyer Commission on Educating Undergraduates in a Research University, 1998, p.18). Universities are 'scholarly communities' (Huber, 2003) and the purpose of undergraduate education is to induct students into that community. Lave and Wenger (1991) speak of learning as being 'configured through the process of [the learner] becoming a full participant in a sociocultural practice' (p. 29), with learning corresponding to 'increasing participation in communities of practice' (p. 47). The 'beginner' develops 'an increasing understanding of how, when and what about old-timers collaborate, collude and collide' (p. 95); they learn to become members of a research community (Coppola, 2001; Brew, 2003a). So research skill development can be seen as an underlying principle of all education, not as something restricted to 'researchers' engaging in activities which compete with their teaching demands.

A framework for research skill development

The emerging question is, why is the research work done as part of undergraduate study not explicitly identified as such more often? Undergraduate research is possible, and is presently being conducted in some disciplines; yet many of the problems raised earlier remain as barriers to its wider implementation. One of these problems, at least, is potentially addressable: the conceptual difficulties faced in facilitating student research skills. This could be addressed by a framework that helps academics conceptualise how they could explicitly facilitate student research skill development.

Research is motivated by curiosity or a need to know about how things are, and what they do or may do. Einstein claimed that his redeeming feature, in terms of research, was not cleverness or giftedness, but that 'I am only very, very curious', and while we may question his self-assessment in relation to cleverness and giftedness, what he says does underscore the pre-eminent characteristic of research: namely, to wonder why. To research, we embark on a voyage of discovery launched by curiosity or need. Children have this capacity to wonder early in life. However, to be maintained, this desire to embark on inquiry needs to be nurtured. Education should lead students to ask research questions of increasing sophistication, specificity, depth and breadth that set them on a journey towards making the unknown known.

Conceptualising and facilitating this journey is a task for all educators, and especially lecturers of undergraduates. At most levels of education, students research knowledge that is unknown to themselves, but which is commonly known to others. This research typically takes the form of assignments which are prescribed by others. As a student's education progresses, their

research moves into a discipline discourse with concepts, language and conventions unknown to those outside that discipline. Research at this level is into the commonly not known. As students become well-acquainted with the canon of a discipline and its research techniques, they may be ready—probably at postgraduate level—to research gaps in the field, or even extend it into areas previously unknown to humankind.

Whether researching into the commonly known, the commonly unknown or the totally unknown, the process may equally be labelled researching or learning: 'research is learning' (Brew, 1988 cited in Brew & Boud, 1995, p.267). Assignment tasks frequently require students to be involved in a process of research, though this is seldom made explicit. All associated activities which could be broadly identified as 'research' can be located on the research continuum, placing a first-year library or internet research assignment on the same continuum as PhD research: the associated set of skills are often the same, but what varies from first year to PhD is the degree of rigor, the level of specialisation and complexity of the discourse, the scope, depth and methodological framework applied to the inquiry process, and the extent of 'unknownness' of the topic under research. The fundamental facets of inquiry are identical, with common processes being acted out across all research endeavours.

This notion of the commonality of research processes underpins the two models we drew upon to identify facets of research, namely the ANZILL (2004) Standards and Bloom's Taxonomy (Bloom *et al*. 1956). The ANZILL Standards comprehensively describe 'the skills or competencies that together make for effective and appropriate use of information' (CILIP 2005), this use being an essential and major part of the research process. Bloom's Taxonomy was developed initially to 'help one gain a perspective on the emphasis given to certain behaviours by a particular set of educational plans… so that it becomes easier to plan learning experiences and prepare evaluation devices' (Bloom et. al., 1956, p.2). Although the Taxonomy was first published fifty years ago, it has been consistently applied to teaching and learning contexts since that time (see, for example, Ormell, 1974; Furst, 1981; Anderson, Sosniak & Bloom, 1994; Krathwohl, 2002) and so provided another widely-applicable framework we considered relevant to research-as-learning. Drawing together elements from these two models led us to specify six facets of the research process: namely, that students embark on inquiry and so determine a need for knowledge/understanding, find/generate needed information/data using appropriate methodology, critically evaluate information/data and the process to find/generate them, organise information they have collected/generated, synthesise and analyse new knowledge, and communicate knowledge and understanding and the processes used to generate them.

As well as these facets, there are variables which span across the whole research process. One of these is the degree of 'knownness'; another is the degree of student autonomy in the research activity. Autonomy is widely acknowledged as an important aim in education (Boud, 1988; Bruce, 1995; Butler, 1999; Fazey & Fazey, 2001). Autonomy in the research context ranges from student engagement with closed inquiries directed towards a pre-determined outcome, involving a high level of structure and guidance and using prescribed methods and processes, through to open inquiries involving high levels of autonomy and self-determination in terms of what is investigated and how the investigation is done. Inquiries can be classified as 'closed' (lecturer-specified) or 'open' (student-specified) in relation to: the question, hypothesis or aim of the task; the procedure followed or equipment used; and the answer, resolution or need for further inquiry which is arrived at (Hackling & Fairbrother, 1996).

Drawing together the facets of research with the degree of student autonomy, we devised a conceptual framework based on an earlier formulation (Willison & O'Regan, 2005), from which to hang conceptions of student research skill and its development. This is the Research Skill Development framework (see pages 8 − 9), the rows of which correspond to the six major student research facets, with the double-ended vertical arrow indicating that the movement through these facets is not linear, but recursive. Students researching may find, for example, whilst synthesising (Facet E) information and data, that they need to reframe their research

question (Facet A). Nevertheless, there is a general progression from Facet A, leading ultimately to Facet F. The five columns in the table represent the degree of student autonomy, with Level 1 corresponding to a low degree of autonomy and describing students working at a level of a closed inquiry, requiring structure and guidance, and Level 5 corresponding to a high degree of autonomy and describing students functioning at the level of open inquiry.

The labelling of the facets and levels with successive letters and numbers is not to imply that students are meant progress through them in a linear, pre-determined way. Nor will a student necessarily, at any one time, be functioning at the same level for all the specified facets. Progression for each student is recursive as well as context-, task- and discipline-specific. An individual student may engage in research behaviour which corresponds to their own individual pathway through the table, moving to higher or lower levels in each facet depending on the variables of context, task and discipline: a student may, at one time and in one context, be functioning for Facet A at Level 2, for Facet C at Level 5 and for Facet D at Level 3, while at another (or the same) time, in another context, their position may be represented by a different cluster of cells.

Students may go though many Level 1 to Level 5 cycles when researching the commonly known in undergraduate studies (or earlier). As they progress towards researching the commonly unknown, they may move through those cycles several more times, finally arriving at the cutting edge of research into the totally unknown. Here they may need guidance again, starting at level I or II, until the autonomy of Level 5 is realisable, and at which point the student is applying the 'standards' of rigour and impact (Glassick *et al.*, 1997) required to generate knowledge new to humankind.

The RSD framework is designed primarily as a conceptual tool for diagnosis and planning, promoting understanding and interpretation of both potential and realised student research skill development.

Research Skill Development Framework

RSD

LEVEL OF STUDENT AUTONOMY ⟵ ⟶

FACET OF INQUIRY ↑↓

	Level 1 *Students research at the level of a closed inquiry* and require a high degree of structure/guidance*	Level 2 *Students research at the level of a closed inquiry* and require some structure/guidance*
A. *Students embark on inquiry and so determine a need for knowledge/understanding*	Respond to questions/tasks arising explicitly from a closed inquiry.	Respond to questions/tasks required by and implicit in a closed inquiry.
B. *Students find/generate needed information/ data using appropriate methodology*	Collect and record required information/data using a prescribed methodology from a prescribed source in which the information/data is clearly evident.	Collect and record required information/data using a prescribed methodology from prescribed source/s in which the information/data is not clearly evident.
C. *Students critically evaluate information/ data and the process to find/generate this information/data*	Evaluate information/data and the inquiry process using simple prescribed criteria.	Evaluate information/data and the inquiry process using prescribed criteria.
D. *Students organise information collected/ generated and manage the research process*	Organise information/data using a simple prescribed structure and process.	Organise information/data using a recommended structure and process.
E. *Students synthesise, analyse and apply new knowledge*	Synthesise and analyse information/data to reproduce existing knowledge in prescribed formats. Ask questions of clarification/ curiosity.	Synthesise and analyse information/data to reorganise existing knowledge in standard formats. Ask relevant, researchable questions.
F. *Students communicate knowledge and the processes used to generate it, with an awareness of ethical, social and cultural issues*	Use mainly lay language and prescribed genre to demonstrate required knowledge and understanding for lecturer/teacher as the audience.	Use some discipline-specific language and prescribed genre to demonstrate self-selected knowledge and understanding from a stated perspective and for a specified audience.

LEVEL OF STUDENT AUTONOMY ➝

Level 3	Level 4	Level 5
*Students research **independently** at the level of a **closed inquiry***	*Students research at the level of an **open inquiry** within **structured guidelines***	*Students research at the level of an **open inquiry** within **self-determined guidelines***
Respond to questions/tasks generated from a closed inquiry.	Generate questions/aims/hypotheses framed within structured guidelines.	Generate questions/aims/hypotheses based on experience, expertise and literature.
Collect and record required information/data from self-selected sources using one of several prescribed methodologies.	Collect and record self-determined information/data from self-selected sources, choosing an appropriate methodology based on structured guidelines.	Collect and record self-determined information/data from self-selected sources, choosing or devising an appropriate methodology with self-structured guidelines.
Evaluate information/data and the inquiry process using criteria related to the aims of the inquiry.	Evaluate information/data and the inquiry process comprehensively using self-determined criteria developed within structured guidelines.	Evaluate information/data and the inquiry process rigorously using self-generated criteria based on experience, expertise and the literature.
Organise information/data using recommended structures and self-determined processes.	Organise information/data using structures and processes suggested by provided guidelines.	Organise information/data using self-determined structures and processes.
Synthesise and analyse information/data to construct emergent knowledge. Ask rigorous, researchable questions based on new understandings.	Synthesise, analyse and apply information/data to fill recognised knowledge gaps.	Synthesise, analyse and apply information/data to fill self-identified gaps or extend knowledge.
Use mostly discipline-specific language and appropriate genre to demonstrate knowledge and understanding within a field from a scholarly perspective and for a specified audience.	Use the language of the discipline and appropriate genre to address knowledge and understanding gaps from several perspectives for a self-selected audience.	Use the language of the discipline, choosing appropriate genre to extend knowledge and understanding, from diverse perspectives for a range of audiences.

RSD terminology

Definitions of key terms that are specific to the RSD approach are given below.

Facet of inquiry: Like jewels, the research process is made up of different facets that combine to create the whole. Each facet of the RSD framework epitomises core elements in all research, whether literature research, laboratory work, clinical research or field research. However, while the RSD labels these elements from A to F, they are not a hierarchical or linear set of stages through which researchers move in order. Rather, they are a conceptual separation of elements of the research process with which students engage in recursive and non-linear fashion at different points during an assessment task or engagement with a text.

Level: A level represents the degree of autonomy in research that a student can achieve or has achieved. Although these levels are arranged in a progression, they are not necessarily a hierarchical construct and do not imply a linear progression from Level 1 to Level 5; a student's location within the levels is context-dependent and individualised.

Shell rubric: A shell rubric is a traditional marking rubric, which includes criteria for assessment of a given task, levels of achievement/grades, and blank spaces for comments or responses against each criterion.

An example of a shell rubric is given in Appendix 1.

Comprehensive rubric: A comprehensive rubric moves beyond the outlines provided by a shell rubric, giving detailed marking criteria for each facet and level. This allows criteria to be explicit, objectives to be clear, and feedback to be extremely detailed. It also allows students to have a clear idea from the outset about what they must do to achieve a target grade.

Using the RSD to develop assessments and curriculum

There are many ways to use the RSD framework. So far, academics on the project team have developed six different methods. The first and most commonly-used approach is to *build an ongoing profile of student research skills.* The second is to *develop student research and technical skills in a uniform progression*, for use introducing new skills to a cohort that requires a clear level of technical skill to practise. The third is to *assign grades*, using the levels as bands of achievement matching High Distinction, Distinction, Credit etc. The fourth is *SOLO-influenced*, and the fifth is to use the RSD framework as a jumping-off point, to create a non-standard framework that *reflects the demands of a particular topic or discipline.* The sixth is the co-creation of marking criteria; in this method students are required to author and/or negotiate some of the criteria by which their work will be assessed.

Below is a description of how to use the RSD to redesign assessment tasks and curriculum in order to build a profile of student research skills.

Curriculum redesign

The RSD is frequently used as a conceptual tool for 'assessment-first' curriculum design.

The process of redesigning curriculum using RSD involves, first, developing marking rubrics, or designing new ones, that are informed by the RSD structure for existing assignments. Doing this first allows changes to the course structure to flow from the changes to the marking rubrics.

One prominent change that occurs as a result of redesigning marking rubrics in this way is that lecturers represent the purpose of assessment tasks to students differently: they give more emphasis to the development of students' research skills in their discipline, which can have positive effects on student engagement. Some lecturers have reported that relatively small changes to assessments have led to substantial differences in the way they talk in class about a journal article or laboratory task, and that this can ultimately alter the whole purpose and feel of a course.

The <u>first step</u> in this method of using the RSD is to reframe the marking of an existing assessment—usually one that falls late in the semester, and ideally the final assessment task in the course—so that it too uses on the RSD format of assessing the 6 research facets, each marked up to Level 3 or Level 4 of the framework.

The <u>second step</u> is to develop a diagnostic assessment. This is typically a task requiring students to synthesise information from two or more literature sources, and is marked up to Level 2 of an RSD rubric, but diagnostics can also be designed to assess laboratory, fieldwork or performance research skills, and skills specific to many other disciplines.

The <u>third step</u>, using these two modified tasks as bookends, is to modify and revise the emphasis of other existing resources and assessment tasks so that they form a coherent sequence.

Developing RSD marking rubrics for individual assessments

In developing an RSD marking rubric for an existing, individual assessment, there are several stages:

- *map* the existing assessment task against the RSD framework to locate it at a **level of student autonomy**;

- *consider* whether the task should remain at that level of inquiry, or to focus on a higher or lower level;
- *analyse* the task using the six RSD **facets**, to identify which facets are present in the existing assessment, which are absent, which need to be strengthened and which need to receive less emphasis;
- *modify* the assessment task to incorporate all facets, and to include all the required levels; and
- using the assessment task as a guide, *develop* a marking rubric based on the RSD shell rubric, to articulate the assessment's requirements accurately to students, and enable quick, effective marking.

Developing a diagnostic assessment

Diagnostic assessments using RSD are usually, but not necessarily, literature research tasks in which students compare and analyse two short pieces of writing on a key topic. The topic should be one that is clearly defined and can be effectively explored in this format and in a limited time frame, as a diagnostic assessment should ideally be completed during a single class period.

The first element in developing a workable diagnostic assessment for research skills is to decide what research skills it needs to cover and what level of autonomy it should encompass. Identify a pair of short texts that contain different perspectives on a relevant topic, devise a task that requires students to identify key ideas and/or locate points of difference and similarity between the articles (you may ask them to present these in note form, to develop a research skill), and to compare and contrast or offer an analysis of the sources. Students should be asked to support their judgements of source validity with evidence (another research skill).

You can then use the RSD shell rubric to articulate your set of assessment criteria, modifying the assessment task and rubric as necessary during the process to ensure that all of the six RSD facets are included and that the task allows students to work to your chosen levels.

Examples of diagnostic assessments and marking rubrics in Human Biology and Electronics Engineering are available on pages 14 and 37.

How to redesign a curriculum using the RSD

To redevelop or redesign a full course curriculum using the RSD, develop an initial (diagnostic) task for the course, using the RSD framework and marking rubric, and then revise a later assessment task (ideally, the final task for the course) and create an RSD marking rubric for it. These will form the two end points of your RSD continuum.

Working from these two end points, determine which 'midway' points and research skills you want to develop and assess in your students. Revise existing tasks, or create new ones, to assess these points.

It is important to remember that the first run of an RSD course will reveal problems and issues that could not necessarily be predicted, so you will need to revise or edit your course over two or three iterations to make it as effective as possible.

You can find a detailed description of Eleanor Peirce and Mario Ricci's experience of designing an RSD course for Human Biology at http://www.adelaide.edu.au/clpd/rsd/explain/humanbio/

10 different approaches to using the Research Skill Development framework

At least ten different approaches to using the Research Skill Development framework have been identified by the project team. These include:

1. *Assessment rubric scaffolding*: the main approach illustrated in this handbook. This approach was used by most members of the project team.

2. *Level-by-level scaffolding*: in this approach the course co-ordinator determines in advance the scope of research appropriate for each assessment task, and grades within that level. This approach was applied in Nursing (p 50), Dentistry and Human Resource Management.

3. *Curriculum re-shaping*: in this approach, all available assessments, laboratory tasks, field components, etc, are shaped by the RSD. See www.adelaide.edu.au/clpd/rsd/ for examples of how the University of Adelaide's Human Biology course used this approach.

4. *Resource module structuring*: this approach was developed at Queensland University of Technology to organise existing, interactive online modules for developing facets of library research skills along a continuum of four levels (see Appendix 3 for more details).

5. *PhD bridging program*: this approach, developed at the University of Adelaide, uses the newly developed RSD7 (see www.adelaide.edu.au/clpd/rsd/rsd7) to structure a marking rubric for draft research proposals written by PhD candidates who are new to the University. In this approach, students self-assess their work and supervisors assess the proposal using the rubric, which then forms the basis for a discussion of differences and expectations

6. *Analysis of existing assessment or curricula*: this approach was used to assess the Problem-Based Learning curriculum of a Medical School to determine the degree of autonomy students were required to achieve during their degree. It is also being used to analyse programs from undergraduate to PhD in a School of Nursing and Midwifery.

7. *Point of departure*: this approach was developed in the Faculty of Humanities and Social Sciences at the University of Adelaide. In it, the RSD framework serves as a basis for developing structured methods for marking analytic works, but its structure was then modified to meet the demands of individual disciplines (p 70).

8. *Inspiration for frameworks for related purpose*: for instance, the Work Skill Development (WSD) framework developed and being evaluated by Sue Bandaranaike at James Cook University (see Appendix 2).

9. *Development of student-negotiated marking criteria*: in this approach, students in a School of Education were given specific marking criteria for three Facets of the RSD, but were required to write and negotiate criteria for the other three Facets, which were then used to assess their research assessment.

10. *Policy guidance*: Universiteit Maastricht in the Netherlands has embedded the RSD into their Dutch-language policy document.

Human Biology

Eleanor Peirce and Mario Ricci

Assessment tasks and marking rubrics:

- Diagnostic exercise
- Literature Research Task 1
- Laboratory Research Task 3
- Population Analysis Report

Between 2004 and 2009, Eleanor Peirce and Mario Ricci revised the whole of their Human Biology course to use RSD principles and marking rubrics. In this course, they take the first and most common approach to using the RSD: to assess the research skills profile for each student at regular points throughout the course.

Human Biology is a two-semester-long First Year course. The course aims to develop fundamental reading, writing and research skills in a large cohort of students, so that they will move into their second-year studies with key skills in place. It focuses on communicating teacher expectations clearly to students, and giving concise and effective feedback that helps students to consistently develop their research skills and improve their work standard over the course of a full year.

For this reason, the Human Biology course includes:

- an initial diagnostic exercise;
- several intermediary assessment tasks in the literature and laboratory research strands;
- a final semester assessment; and
- a second-semester field research task that combines elements of literature and laboratory research work.

In this approach to using the RSD, assessment tasks are structured to build on each other, with each literature or laboratory assignment developing aspects of an earlier one. You can see examples of this in the similarities between the diagnostic exercise and Literature Research Task 1 in the following pages.

Assessments are also designed to expand and integrate students' concepts of what research is. The two strands of the semester 1 course are therefore designed to introduce students to two distinct cultures of research—the culture of scientific literature research, and the culture of laboratory practice—while the final task, the Population Analysis field report in Semester Two, requires students to combine elements of both, while further developing new skills.

Study and Research Skills in the Health Sciences

Orientation Week Screening

Background/Rationale

The University environment is one in which you will be exposed to many new and different experiences and challenges. You will meet people from different backgrounds; encounter different methods of course delivery and course materials of a more challenging nature, and need to cope with varying expectations of what, and how much, you will successfully achieve. Initially, courses may appear to be presented in a foreign language, as lecturers routinely use unfamiliar, discipline-specific terminology in classes. As part of your studies you will be required to read and interpret various course materials, critically evaluate and synthesize them into a coherent story, and effectively communicate ideas and findings using the appropriate format and language for the discipline area. All of these requirements assume at least a basic level of skill in accessing and critically analysing discipline-appropriate literature.

The short task that you are asked to undertake is aimed at identifying your current level of ability in recognising, extracting and logically organising key points from literature available on a topic. The outcomes of this task will enable us to provide you with appropriate support (e.g. tutorials, workshops, online guides) to enable you to develop and refine the research skills necessary to succeed in your studies in Health Sciences.

Task Instructions:

Read the two short articles about obesity printed on the reverse side of this handout and complete tasks 1 and 2.

1. *Integrate the information presented in the two articles to write your own dot-point notes on the worksheet attached.* To do this:

    *   Identify 3-4 key ideas from the articles
    *   Use these key ideas to formulate headings
    *   Make bullet-point notes and list them under these headings.
    *   After each point, indicate its source, i.e. whether the idea came from article 1, article 2, or both
    *   Provide a title that embodies the content of your notes.

2. Write one or two short paragraphs (incorporating appropriate sentence structure, spelling and grammar) that address the following questions.

    *   Which of the two articles do you consider to be the better source? On what characteristics/features of the article have you based your choice? / How have you arrived at your choice

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Childhood obesity: modernity's scourge

Overweight and obesity affect about 23% of Australian children and adolescents, with 6% being obese.[1] These are conservative estimates, as there has been no systematic monitoring of the prevalence of overweight and obesity in Australian children and adolescents since 1995. However, over the previous decade, the prevalence of overweight children has almost doubled, and the prevalence of obese children more than tripled.[1],[2]

Health inequalities related to overweight and obesity are evident. There is a higher incidence of overweight and obesity in children of parents of particular backgrounds,[3] and maternal education is the strongest social determinant of overweight and obesity in childhood.[4] Although there are limited national data, and combined New South Wales, Victorian and National Nutrition datasets[1] failed to find a rural/urban difference, Victorian epidemiological data show a statistically significant, higher proportion of overweight and obese boys in metropolitan areas, but this difference was not found for girls.

The health consequences of overweight and obesity are substantial.[5] Issues of social acceptance, athletic competence and physical appearance are well known to obese children and affect their sense of social and psychological wellbeing. Obese children with decreasing self-esteem are more likely to smoke and drink alcohol compared with those whose self-esteem increases or remains the same.[7] Obese children and adolescents may also have a range of medical conditions including hypertension, dyslipidaemia, and even type 2 diabetes. Other problems, such as musculoskeletal discomfort, obstructive sleep apnoea, heat intolerance, asthma and shortness of breath, greatly affect their lifestyle.[8]

Addressing the determinants of health and wellbeing for children and adolescents will improve population health and wellbeing overall. The overarching cause of the obesity epidemic is energy imbalance — a relative increase in energy intake (food intake) together with a decrease in energy expenditure (decreased physical activity and increased sedentary behaviour). Identifying the most important predictive determinants of each of these behaviours, as well as the most effective and sustainable remedial strategies, is complex and involves parental education and employment; housing environments; play, recreation and physical activity; food and nutrition; accessible active transport; and child-friendly physical and social environments.[9]

From: Waters EB and Baur LA 2003 Childhood obesity: modernity's scourge. Medical Journal of Australia 178(9), 422-423.
http://www.mja.com.au/public/issues/178_09_050503/wat10857_fm.pdf

Halting the Obesity Epidemic: A Public Health Policy Approach (2000)

Traditional ways of preventing and treating overweight and obesity have almost invariably focused on changing the behavior of individuals, an approach that has proven woefully inadequate, as indicated by the rising rates of both conditions. Considering the many aspects of American culture that promote obesity, from the proliferation of fast-food outlets to almost universal reliance on automobiles, reversing current trends will require a multifaceted public health policy approach as well as considerable funding.

National leadership is needed to ensure the participation of health officials and researchers, educators and legislators, transportation experts and urban planners, and businesses and non-profit groups in formulating a public health campaign with a better chance of success. The authors outline a broad range of policy recommendations and suggest that an obesity prevention campaign might be funded, in part, with revenues from small taxes on selected products that provide "empty" calories—such as soft drinks—or that reduce physical activity—such as automobiles.

They conclude by saying 'we do not pretend that these suggestions alone will eliminate obesity from American society, but they will be valuable if they help to produce even small reductions in the rate of obesity, as even modest weight loss confers substantial health and economic benefits. Without such a national commitment and effective new approaches to making the environment more favorable to maintaining healthy weight, we doubt that the current trends can be reversed'.

From: Nestle M and Jacobson MF 2000 Halting the Obesity Epidemic: A Public Health Policy Approach. Public Health Reports 115, 12-24.
Web reference: http://www.cspinet.org/reports/obesity.pdf

RSD Diagnostic: Marking Criteria

Student Name: _____ Student ID: _____

Marker: _____

Facet of Inquiry	Student Autonomy Level 1 — Students research at the level of a **closed inquiry** and require a **high degree of structure/guidance**	Student Autonomy Level 2 — Students research at the level of a **closed inquiry** and require **some structure/guidance**	Level 3
A. Students **embark** on inquiry and so determine a need for knowledge/ understanding	❑ Identifies some peripheral or duplicated ideas as key	❑ Identifies KEY ideas	❑
B. Students **find/generate** needed information/data using appropriate methodology	❑ Points/notes generated partially relate to the headings under which they are listed ❑ Notes produced are sourced predominantly from 1 text only	❑ Points/notes generated elaborate on the key ideas to which they are linked ❑ Notes produced draw on ideas from both texts	❑
C. Students **critically evaluate** information/data and the process to find/generate it	❑ Identifies indicators of source credibility and reliability but does not fully apply them in evaluating data or process	❑ Identifies several relevant indicators of source credibility and reliability and provides appropriate rationale for usage/inclusion of information	❑
D. Students **organise** information collected/ generated	❑ Has attempted a note-taking framework, but information is organised predominantly as a list of undifferentiated bullet points	❑ Uses a hierarchical note-taking framework that organises related information under the appropriate key headings.	❑
E. Students **synthesise, analyse** and **apply** new knowledge	❑ Produces point form notes (information is not directly copied or in sentence format) but notes separated according to source	❑ Combines and integrates ideas/data from different sources to generate notes	❑
F. Students **communicate** knowledge and the processes used to generate it with an awareness of ethical, social and cultural issues	❑ Title is present ❑ Partial and/or incorrect acknowledgement of sources of information	❑ Title relates clearly to the key ideas presented in the notes ❑ Full and correct acknowledgement of sources of all noted information	❑

Literature-based Research Skill Development Task 1:
Note Taking, Synthesis and Integration of Scientific Literature

Background:

Part of being a sound scientist involves being "information literate", i.e. having the research skills that enable you not just to locate or collect information related to a topic, but to also critically evaluate, process, integrate and apply that information (which may be collected from a range of different sources), to a specific situation or within a specified context. The Lit-RSD tasks that form part of the assessment for Human biology IA are aimed at assisting you to develop and/or refine these essential research skills while studying the structure and function of the human body.

Lit-RSD Task 1 expands upon and extends the RSD diagnostic task introduced in O-week, and focuses on the identification and appropriate acknowledgement of key scientific information about a specified topic and its effective use in constructing a coherent written summary of the topic.

Aims:

Through the completion of Lit-RSD Task 1 each student will have the opportunity to develop and refine the following research skills: -

- Effective note taking, using a framework that identifies key terms, ideas and/or concepts, and organises relevant points and information in relation to these terms in a hierarchical manner.

- Synthesis and integration of key terms and information derived from different sources to form a single set of structured notes that accurately and efficiently conveys the scientific message without duplication of ideas or data.

- Production, from the notes taken, of a logically presented, coherent, piece of writing that conveys the key scientific concepts or findings related to the topic.

- Accurate tracking and documentation, both within the notes and piece of writing, of the origins and/or "ownership" of all key terms, information and ideas derived from the literature provided about the topic (i.e. referencing).

Resources and Requirements for Task:

In order to complete Lit-RSD Task 1, you will need to access the following file, which is available from the Human Biology IA Assignments folder on MyUni: -
- "Bone" Information File – this file contains copies of articles and links to websites from which the notes for the task are to be taken.

You might find the following resources useful in completing the task: -
- Anderson J and Poole M 2001 *Assignment and Thesis Writing 4th Ed.* Wiley Brisbane. Chapter 2 Planning the Assignment, pages 9-17. – The chapter provides general guidelines on taking reliable notes, organising information and planning a piece of writing.
- Marking Criteria for Lit-RSD Task 1 (available in the Human Biology IA Assignments folder) – This document provides an indication of the characteristics that will be assessed.
- Guidelines explaining the Harvard System of reference citation – The Barr Smith Library website links to several useful documents on referencing. We will provide specific guidelines on application of Harvard referencing with Lit-RSD Task 3 later in the semester.

A Research Skills Support Session, run in conjunction with staff from CLPD (Centre for Learning and Professional Development) will be held in the Laboratory Session times scheduled in week 2 of semester (i.e. Wednesday 7th Mar 2-4pm and Thursday 8th Mar 9-11am). The venue is Lab S210a, Medical School South on both days. At the session we will:
1. Provide feedback about the O-week Diagnostic Task.
2. Discuss how to approach the RSD tasks.
3. Explain the marking criteria used for RSD tasks.
4. Introduce some of the tools available for finding scientific information.

Summary of Task:

Students will access the "Bone" Information File, which contains articles and links to information about bone structure and remodeling. From these sources, students will take structured, dot point notes, based around 3 or 4 key scientific concepts or ideas presented in the articles. The notes will then be used to prepare a short, written summary or abstract (not more than 1-1½ A4-sized pages, single spaced) that integrates each of the key concepts and ideas and accurately reports information from the original sources. Throughout the task, the sources of all information will be appropriately tracked, and the final written summary will use the Harvard system of reference citation to acknowledge the origins of data and ideas.

Specific Instructions:

Follow the steps indicated to ensure that each aspect of the competency exercise is undertaken.

STEP ONE

Access the "Bone" Information File.

The file is available in the Assignments Folder of the Human Biology IA MyUni website and contains various information sources about bone structure and remodeling. Read each of the articles or web pages indicated.

STEP TWO

Construct notes from the sources provided.

1. Identify a theme or context around which you will base your notes. Use this to formulate a title for your notes and subsequent summary or abstract (see Step Three).
2. From the sources provided, identify 3 or 4 key terms, ideas and/or concepts and use these as sectional headings for your notes.
3. Under each of your headings, organise the relevant information and data in dot point format, using symbols and abbreviations where appropriate.
4. Indicate the origins of all information, i.e. use a tracking system that links the information with the article or web page from which it was taken. [The designated system of reference citation for Health Sciences courses (with the exception of Psychology) is the Harvard system. Find out information about this system and have a go at using it. The finer details of how to apply Harvard referencing will be presented in the tutorial session in week 5.]

STEP THREE

Write a short summary or abstract that presents the key findings as identified in your notes.

The summary or abstract should incorporate the following features: -

1. A readily identifiable organizational framework or structure that is consistent with the overall context and title of the summary (e.g. introductory sentence, body of discussion of key areas, iterative or concluding sentence).
2. Integration of materials from the various sources in relation to each of the key concepts/ideas documented.
3. Logical linkage of key concepts and their synthesis into a coherent whole.
4. Evidence of understanding (e.g. provision of definitions and explanations) of all scientific data and the context in which they are presented.
5. Documentation of sources, both within the written text, and through the provision of a reference list.

STEP FOUR

Edit/review your work and check that you have addressed all aspects of the task before submitting it for assessment.

1. Check what you have written against both the specific task instructions given in this document, and the Research Skills Assessment Criteria.
2. Check your assignment using an editing checklist. The Centre for Learning and Professional Development Language and Learning Service provides an editing checklist via its website http://www.adelaide.edu.au/clpd/lls/stud_resources/
3. Attach a completed assignment coversheet (available via MyUni) to the front of your Lit-RSD Task 1 and lodge it before the deadline in the locked assignment box in the corridor outside of the School of Medical Sciences Office, level 3, Medical School North. The declaration on the coversheet must be signed. Please retain a copy of your assignment for your records.

Literature Task 1: Marking Criteria

RSD

Student Name: _____   Student ID: _____

Marker: _____

↓ Facet of Inquiry	Student Autonomy Level 1 *Students research at the level of a closed inquiry and require a high degree of structure/guidance*	Students Autonomy Level 2 *Students research at the level of a closed enquiry and require some structure and guidance*	Student Autonomy Level 3 *Students research independently at the level of a closed enquiry*
A. *Students embark on inquiry and so determine a need for knowledge/understanding*	❑ Identifies some peripheral or duplicated ideas as key	❑ Identifies key ideas based on several sources	❑ Identifies key ideas utilising all sources
B. *Students find/generate needed information/data using appropriate methodology*	❑ Points/notes generated partially relate to the headings under which they are listed (some points not relevant to heading) ❑ Notes produced are sourced predominantly from 1 text only	❑ Points/notes generated elaborate on the key ideas to which they are linked, but relevant data from some sources omitted, e.g. _____ _____ ❑ Notes produced draw on ideas from several texts	❑ Points/notes generated fully and completely elaborate on the key ideas to which they are linked ❑ Notes produced draw on ideas from all texts
C. *Students critically evaluate information/data and the process to find/generate this information/data*	❑ Identifies indicators of source credibility and reliability but does not fully apply them in evaluating data or process	❑ Identifies several relevant indicators of source credibility and reliability and provides appropriate rationale for usage/inclusion of information	❑ Identifies a wide range of indicators of source credibility and reliability and fully applies these in selection of data for inclusion
D. *Students organise information collected or generated*	❑ Has attempted a note-taking framework, but information is organised predominantly as a list of undifferentiated bullet points ❑ Report structure follows general layout of notes, and has a beginning, middle and end	❑ Uses a hierarchical note-taking framework that organises related information under the appropriate key headings ❑ Report based on notes; Ideas/data linked within sections/paragraphs, but no clear linkage between sections Poor linkage of: _____ _____ _____	❑ Uses a hierarchical note-taking framework that appropriately organises related information according to sub-headings under key headings ❑ All sections of report linked with coherent flow both within and between sections
E. *Students synthesise, analyse and apply new knowledge*	❑ Produces point form notes (information not directly copied or in sentence format) but notes are separated according to source ❑ Report largely restates original data with minimal integration across sources	❑ Combines and integrates ideas/data from different sources to generate notes, but some inaccuracies or misinterpretations evident ❑ Report presents integrated ideas/data but overall theme closely resembles that of original sources	❑ Combines and integrates ideas/data from different sources to generate notes that accurately reflect sentiment/ideas portrayed in the original sources ❑ Report incorporates paraphrasing of data/ideas and presents "new" interpretations/context from that of original source(s)
F. *Students communicate knowledge and the process used to generate it with an awareness of ethical, social and cultural issues*	❑ Title is present ❑ Partial and/or incorrect acknowledgement of sources within notes and/or report ❑ Partial/incorrect reference list provided	❑ Title relates to the key ideas within the report, but requires some refinement ❑ Full acknowledgement of all sources within notes and report ❑ Reference list contains all sources cited	❑ Title clearly and succinctly reflects contents of the report ❑ Full and correct acknowledgement of all sources within notes and report, with differentiation between quotation and paraphrase ❑ Reference list contains all sources cited and follows referencing conventions

Activity 3.2: Light Microscopic Observation of Cells

In this activity, you will prepare a sample of the cells that line the inside of your cheeks (i.e. a buccal smear) and then examine it under a light microscope.

METHOD FOR THE PREPARATION AND STAINING OF A BUCCAL SMEAR

Prepare specimens as follows:
1. Using a pipette, place a small drop of distilled (purified, clean) water in the centre of a clean microscope slide.
2. GENTLY and lightly scrape the inner lining of your cheek with the broad end of a flat toothpick.
3. Stir the toothpick vigorously in the drop of water on your slide, and then dispose of the toothpick in the container for hazardous waste.
4. Cover the drop with a clean cover slip lowered onto the slide at an angle to minimise the formation of air bubbles between the specimen and the cover slip. If there is too much liquid on the slide, blot the excess from the edges of the cover slip using absorbent paper towel.
5. Repeat steps 1 to 4 for a second specimen, but this time add a drop of 10% methylene blue stain to the water-cheek cell suspension on the slide, prior to adding the cover slip.

METHOD FOR LIGHT MICROSCOPIC EXAMINATION OF A CELL SMEAR

6. Examine your prepared specimens by following the protocol for the appropriate use of a light microscope as presented on pages 1-2 of the Laboratory Notes. Examine the appearance of the cells on the slide using first the low power, 4x objective lens, before moving to the higher power 10x and 40x objective lenses.
7. In Table 3.1, draw the typical appearance of a cheek cell, as observed at high magnification for both the unstained and the stained smear.

Table 3.1

Appearance of Unstained Cheek Cells	Appearance of Stained Cheek Cells

8. On each of your drawings, accurately label the cell's nucleus, cytoplasm and plasma membrane. Can you identify any additional components or features of the cells in your smear preparations? If so, label these on your drawings.
9. What effect, if any, did the methylene blue have on the cells in your preparation? List the advantages of staining cells (and tissues) before viewing them under the light microscope.

10. Most tissue preparations are stained with not one, but two different dyes. The most widely used combination of dyes used for staining in light microscopy is haematoxylin and eosin (H&E). What colour is haematoxylin?

    What colour is eosin?

11. Now briefly examine slide 56 – Lip (H&E) from your slide box. Locate the region of tissue shown on the laboratory monitors. This region is the inner surface of the lip and is composed of the same cell type as that in your smear. How do these cells appear different from those in your smears?

12. Explain the reason(s) for the differences in cellular appearance between the two preparations.

13. On the basis of their appearance and arrangement, suggest a possible function(s) of buccal cells. Where possible, link individual features with their contributions to the overall function of these cells.

14. Review what you have achieved by completing Activity 3.2 and list up to 3 learning objectives addressed by the activity.

RSD

Laboratory 3, Activity 3.2: LM Observation of Cells: Marking Criteria

Student Name: _____   Student ID: _____

Marker: _____

↓ Facet of Inquiry	Student Autonomy Level 1 Students research at the level of a <u>closed inquiry</u> and require a **high degree of structure/guidance**	Students Autonomy Level 2 Students research at the level of a **closed inquiry** *and require some structure and guidance*	Level 3 Students research **independently** at the level of a **closed inquiry**
A. *Students embark on inquiry and so determine a need for knowledge/ understanding*	❑ Identifies an appropriate purpose/reason for undertaking Activity 3.2 (LM Observation of Cells)	❑ Clearly & concisely identifies several principle purposes/ reasons for undertaking Activity 3.2 (LM Observation of Cells)	
B. *Students find/generate needed information/data using appropriate methodology*	Generally follows methods/ protocols, yet some aspects omitted or incomplete, for: ❑ preparation of a cell smear ❑ staining ❑ operation of microscope ❑ Q9 or Q10 correct	Rigorously adheres to methods/ protocols for: ❑ preparation of a cell smear ❑ staining ❑ operation of microscope ❑ Q9 & Q10 correct	
C. *Students critically evaluate information/data and the process to find/generate this information/data*	❑ Presents data generated after consideration & evaluation of only part of the overall activity ❑ Accurate contrast, missing some details, in Q11	❑ Presents data based on consideration & evaluation of most or all parts of the activity ❑ Accurate, detailed contrast in Q11	
D. *Students organise information collected/ generated*	❑ Produces drawings that are partially labelled & depict some structural features of the cells ❑ Ideas/ data not always presented in a logical sequence within answers	❑ Produces drawings that are appropriately labelled & accurately depict most or all observable structural features of the cells ❑ Ideas/data presented in logical sequence within answers	
E. *Students synthesise and analyse and apply new knowledge*	❑ Understanding of cell structure & function is based on cell smear activity only ❑ Some valid inference in Q12 or Q13 ❑ Linkage between cellular features & functions partially explained or incorrect for Q 13	❑ Understanding of cell structure & function utilises data obtained from the cell smear activity as well as other sources (e.g. interpretations of tissue section) ❑ Explanation based on evidence and valid inference in Qs 12 & 13 ❑ Linkage between cellular features and functions fully explained & accurate for Q 13	
F. *Students communicate knowledge and the process used to generate it, with an awareness of ethical, social and cultural issues*	❑ Aspects of the student's conduct within the laboratory indicate some awareness of safe practice protocols	❑ Student's conduct within the laboratory indicates a thorough awareness and understanding of safe practice protocols	

ASSESSMENT TASK 2:
Population Analysis – Laboratory Report

Timeline:

The deadline for submission of the laboratory report is **Monday 13th October 2008, 4.00pm** (week 10 of semester).

Please note that you will be required to collect the data on which to base your report in your own time as class time has not been allocated to this activity. The course coordinators will be available to provide assistance with data analysis (i.e. construction of life tables and graphs) in weeks 7 and 8 of semester and at designated times during the first week of the mid-semester break – September 22nd-26th 2008. Please consult the Human Biology IB Notice board in MyUni in week 8 of semester for the times when assistance will be available.

Late submission of the report will attract marking penalties at the rate of a 5% deduction from the total mark allocated to the task per day of lateness. Reports submitted more than 5 days late will not be awarded a mark.

Rationale for Task:

Throughout the Human Biology courses there has been an emphasis on the development of research and communication skills within a discipline specific context. To date students have been introduced to, and given the opportunity to apply through a variety of assessment tasks, skills in the location, interpretation, critical evaluation and integration of scientific information. While previous assessment tasks have been based around scientific research conducted by other individuals and reported in the literature, this assessment task requires that students collect and interpret their own scientific data set. These data are then to be discussed in a short, written report supported by evidence (which is appropriately acknowledged) from similar studies in the research literature.

Aims:

The broad focus for this assessment task is to undertake an analysis of the characteristics of a human population in order to gain an understanding of:

- basic concepts of population demography

- how populations change over time

- factors that influence population change, and

- what past and/or current environmental, social and political circumstances might predict about the composition of future populations.

A suggested way of collecting relevant data for analysis, e.g. information about the age composition and sex ratio with a population, is to visit a cemetery and record details of ages at death for males and females who died during a particular time period. Instructions on how to do this are provided later in this document. [Note: You may choose to obtain your data in some other way. This is acceptable, but you must fully document how and from where you obtained data in the Materials and Methods section of your report.]

Through the successful completion of this assessment task each student has the opportunity to: -

1. Apply scientific method in the investigation of human population dynamics.

2. Learn about methods of data collection and their limitations, e.g. biases arising from sampling techniques and difficulties/limitations in data interpretation arising from collection methods.

3. Develop skills in the manipulation of data sets via the construction of life tables, and survivorship and mortality curves (graphs).

4. Investigate/research factors that shape the composition and dynamics of human populations.

5. Further develop skills in the communication of scientific information through the preparation of a short written report about the characteristics of the chosen population.

6. Consolidate skills in library research (use of search engines, indexes and databases), integration and referencing of scientific information.

7. Develop skills in critical analysis through self-evaluation of the report against a set of criteria around which the report will be assessed.

General Task Instructions:

The assessment task involves writing a short scientific report based on the collection and analysis of demographic data for a specific population of humans. Details of how to go about collecting and interpreting population data are provided in the following notes. Information about the general format of a scientific paper or report was provided in the notes for **Lab 1: Principles of Scientific Writing**. (Copies of these notes are available on MyUni).

Please take note of the following points before commencing your investigations.

i.   You may choose to sample a time period and location different from the ones listed later in these notes, e.g. age at time of death during a particular year, or mortality patterns for individuals who are buried in a rural as compared with an urban locality. What population you sample and the time interval you use will depend on the hypothesis or question you are posing about the composition of the population, or the aspect of population dynamics you wish to investigate. Similarly, the time interval chosen may depend on availability of a large enough sample size.

ii. It is acceptable to collect data by methods other than visiting a cemetery. You must, however provide full details of how, and from where, you accessed your data set.

iii. You may choose to share the collection of data with a group of other students. Each student must however analyse the data separately and write up their own report about the findings.

iv. There is no prescribed page or word limit for the report, but it is expected that the topic can be adequately presented in 6-8 pages, excluding figures, tables, references and appendices.

v.   It is expected that the format of the written report will follow the guidelines for a short paper or report provided in the notes for Lab 1.

vi. Hand written reports are acceptable provided that the script is legible.

To assist you in determining whether your report includes all of the attributes that will be assessed, please self-evaluate your report against the criteria identified in the **Report Checklist**. (This is provided as a separate document that you can download and print from MyUni). The checklist must be attached to your submitted assignment, along with a coversheet that includes a signed statement to the affect that the report is your own work. You should also access the Marking Criteria document for this task (on MyUni).

Background to Population Dynamics:

A population is a group of interbreeding individuals that inhabits a particular place. The study of populations is known as **demography** meaning in Greek "description of the people".

Populations vary in both space and time. In order to understand the dynamics of a population, the number or proportion of males and females and their ages must be known, along with how rapidly the population's numbers are increasing or decreasing. Fluctuations in the size of a population are related to differences in its birth and mortality rates (natural movement), and the rate of migration into or out of the population (migratory movement). These properties of a population are measured in a statistical way by calculating a number of biometric functions as defined below.

The four simplest measures of changes in the size of a population are:

1. The **crude birth rate**, calculated as the number of births during a year divided by the total population size.

2. The **crude death rate** (the number of deaths occurring during a year as a proportion of the total population size).

3. The **rate of emigration** from the population (number of persons leaving during a year as a proportion of the total population size).

4. The **rate of immigration** into the population (number of people arriving as a proportion of the total population size).

Such simple measures however do not take into account the age or sex composition of a population, hence the name "**crude rates**". Many biological phenomena vary in a more or less orderly fashion with age. For example, the probability of living from one instant to the next is a function of an organism's age, as well as the conditions encountered in its environment. Although individuals become fecund (capable of child-bearing) at puberty, they reach their full child-bearing potential only at around 20 years of age. An age-specific approach, then, is essential to understanding the dynamics of a population.

Age-specific rates are more precise measures of population dynamics as they relate births, deaths etc. not to the total population size, but to the number of individuals of a given age. For example, the age specific fertility rate of women aged 20-24 years is the number of children born to mothers aged 20-24 years divided by the total number of women aged 20-24 years within the population. The age specific mortality rate is commonly expressed as the probability of dying during a year at a given age. For example, the probability of dying at age 43 is the number of persons aged 43 who died during a year, divided by the total number of 43 year olds in a population.

If the age-specific rates of fertility, mortality, emigration and immigration for a population are known, it is possible to **predict** the characteristics of the population in the future, assuming that the rates will remain constant, i.e. that environmental conditions will not change. Of course, the characteristics of the population at the present time are the result of occurrences in the population in the past.

Life Tables

A life table is a convenient format for describing the pattern of mortality in a population in a formal, mathematical way. The first life table was calculated by the British astronomer Halley during the 17th century for the City of Wroclaw (now in Poland). Life tables were developed and are commonly used by demographers working for life insurance companies, who have a vested interest in knowing how long people can be expected to live. An example of a life table is presented as Fig. 1. Formulae for calculating age-specific biometric functions of the life table are included with these notes. The meaning of these functions will be explained during the laboratory session..

Figure 1: Life Table: Australian Population, 1960's.

age x (yrs)	d_x	l_x	q_x	L_x	T_x	e_x
0	0.0294	1.0000	0.029	9.853	68.028	68.03
10	0.0084	0.9706	0.009	9.664	58.175	59.94
20	0.0149	0.9622	0.015	9.547	48.512	50.42
30	0.0187	0.9473	0.020	9.379	38.964	41.13
40	0.0439	0.9286	0.047	9.067	29.585	31.86
50	0.1102	0.8847	0.125	8.297	20.519	23.19
60	0.2251	0.7746	0.291	6.620	12.222	15.78
70	0.3028	0.5494	0.551	3.981	5.602	10.20
80	0.2087	0.2467	0.846	1.424	1.621	6.57
90	0.0372	0.0380	0.979	0.194	0.198	5.21
100	0.0008	0.0008	1.000	0.004	0.004	5.00
110	0.0000	0.0000	1.000	0.000	0.000	0.00

Methods for Investigation of a Population:

One method of investigating the characteristics of a population is to sample a "captive" group, such as that found buried in a cemetery. Most tombstones and plaques in memorial walls provide information about the dates of birth and death of individuals and their age at the time of death; analysis of these data then provides a snapshot of the population's characteristics. Hence by collecting data from local cemeteries, information can be gleaned about the population of *Homo sapiens* that inhabited particular regions of Adelaide and South Australia over the last 150 or so years.

Each student is required to collect data on the age at death of individuals within a specific population of their choice. In order to determine whether population characteristics have changed over time, different time frames should be investigated by the class as a whole. Suggested populations that could be investigated include those from specific localities where individuals died:
- Prior to 1860.
- Between 1860 and 1879.
- Between 1880 and 1899.
- Between 1900 and 1914.
- Between 1915 and 1919.
- Between 1920 and 1939.
- Between 1940 and 1949.
- Between 1950 and 1969.
- Between 1970 and 1985.
- Between 1986 and 2000
- After 2000
- During any other time interval as designated by the investigator.

Collect data for <u>one population group</u> only; if you wish to undertake a comparative study of populations living in the same locality in different time frames, or living during the same time frame but in different localities, you are permitted to share data collected by other students.

From where should I collect my data?

Suitable cemeteries (in terms of their size) from which to collect data include: -
- West Terrace Cemetery
- Hindmarsh Cemetery
- Luhr's Road Cemetery, Payneham.
- Mitcham Cemetery
- Cheltenham Cemetery
- Enfield Cemetery
- Centennial Park Cemetery
- Klemzig Pioneer Cemetery
- any other cemetery from which a large enough data set can be collected. You might like to confirm with the subject coordinator that your choice is suitable before collecting your data.

PLEASE DO NOT CONTACT CEMETERY AUTHORITIES WITH REQUESTS FOR THEM TO SUPPLY YOU WITH DATA FROM THEIR RECORDS AS THEY ARE UNABLE TO DO THIS FOR NUMEROUS STUDENTS.

How should I collect my data, and how much data is required?

The success or otherwise of this activity depends in part upon an **efficient and valid system of data collection**. The aim is to **systematically collect data from <u>EACH RELEVANT TOMBSTONE</u> in the cemetery or section of the cemetery**. **Do not collect data just from those tombstones that are "nicer looking" or more readable, as this will bias your sample. Likewise, do not sample a tombstone more than once.** Each student should aim to collect data for <u>at least 1000 individuals</u> in their population group. In order to minimise the work involved in data collection, students collecting data for the same population group may like to organise themselves into teams of three or four, with individuals collecting data from tombstones in different sections of the cemetery and then pooling their data into one data set. In this way a larger data set can be obtained for less individual effort.

Data on the **age of individuals at the time of their death** should be collected. In most cases, an age will be displayed on the tombstone. In others you may have to calculate an age from the dates of birth and death given. **Age** at time of death **need only be estimated to the nearest year** for our purposes. Please **record data for females and males separately**. Separate data sheets for females and males have been provided with these notes.

How should I analyze my data?

Each student should:

- Express the results of their data collection in the form of a frequency distribution graph of age at time of death for each sex (if working as part of a team, collate the data collected by all team members before doing this).

- Calculate the percentage of the total population of each sex represented in the cemetery that died at a particular age.

- Calculate all biometric functions of the life table for males and for females separately. These functions are explained on the following page of these notes.

- Discuss the results obtained and their possible significance, i.e. what they might infer about the characteristics of the populations and possible factors influencing the population.

You might like to consider the following questions when analyzing your data and writing your report. Some or all of the questions might generate discussion that is applicable to your sample population. It is not appropriate however to just answer these questions in the discussion section of your report without placing your study within the wider context of other population studies reported in the literature.

Are there any differences in the pattern of mortality between men and women? If so, what are these differences and how might they be explained?

What is the average age at which death occurs in men and women?

Do all of the individuals in the cemetery represent a single cohort? In what ways will this affect interpretation of the data?

Are there any peaks in the mortality schedules? How do you interpret these?

Did you find any evidence of migration into or out of the population? What form might such evidence take?

How does natural increase influence the data?

What differences might you expect in the appearance of a frequency histogram for a population with a high infant mortality, as compared to one for an ageing population?

Marking Criteria for Population Analysis Laboratory Report

RSD

Student Name: …………………………………………………………………………… Student ID: …………………………………………

Marker: ………………………………………………

← Level of Student Autonomy →

Facet of Inquiry	Level 1 *Students research at the level of a closed inquiry and require a high degree of structure/guidance*	Level 2 *Students research at the level of a closed inquiry and require some structure/guidance*	Level 3 *Students research independently at the level of a closed inquiry*	Level 4 *Students research at the level of an open inquiry, within structured guidelines*
A. *Students embark on inquiry and so determine a need for knowledge/ understanding*	❏ Aims/hypothesis not made explicit	❏ Aims/hypothesis not clearly stated or inappropriate	❏ Aims/hypothesis clear, but adheres closely to guidelines	❏ Aims/hypothesis clear, focussed and innovative
B. *Students find/generate needed information/data using appropriate methodology*	❏ Source of data is cited (cemetery name/location, ABS, etc)	❏ Data sampling protocols are adequate	❏ Data gathered are appropriate to aims/hypothesis	❏ Data from a variety of sources or rigorous data collection
C. *Students critically evaluate information/data and the process to find/generate it*	❏ Self-evaluation of project (completed the 'Report Checklist')	❏ Limitations <u>or</u> biases of the study are stated	❏ Limitations <u>and</u> biases of the study are stated	❏ Evaluation of the whole study design is rigorous
D. *Students organise information collected/ generated*	❏ Data gathered but not presented in a report writing structure Missing _____ _____ _____	❏ Data are incorporated into a report writing structure but there is no clear linkage between sections Poor linkage of _____ _____	❏ Report writing conventions are generally followed with coherent flow Areas for improvement: _____ _____	❏ Report writing conventions are followed completely
E. *Students synthesise, analyse and apply new knowledge*	❏ Limited synthesis of data with literature ❏ *Results restated with minor analysis*	❏ Data compared <u>or</u> contrasted with literature ❏ Data analysis, but inappropriate on occasions	❏ Data compared <u>and</u> contrasted with literature ❏ Data analysis is appropriate	❏ Synthesis of data with other studies is rigorous ❏ Data analysis is comprehensive
F. *Students communicate knowledge and the processes used to generate it, with an awareness of ethical, social and cultural issues*	❏ Title is present ❏ Sources are used, but Harvard referencing style is not applied	❏ Title portrays a general sense of the study content ❏ Sources are used and sometimes Harvard referencing style is applied	❏ Title succinctly portrays the full dimensions of the study ❏ A variety of sources is used and Harvard referencing style is usually applied	❏ Title succinctly portrays a study from an "original" perspective ❏ A variety of source <u>types</u> is used and Harvard referencing style is applied consistently

Introduction to Tertiary Learning

Rowena Harper

Assessment tasks and marking criteria:

- Assignment 2 – Annotated Bibliographies
- Assignment 5 – Research Paper

In Semester 1 2008, Rowena Harper applied the RSD to her Introduction to Tertiary Learning course at the University of South Australia. Like Eleanor Peirce and Mario Ricci in Human Biology, Rowena took the approach of using the RSD to assess the research skills profile of each student at regular points throughout the Introduction to Tertiary Learning course.

Introduction to Tertiary Learning is a foundation skills course which students who come to tertiary study without formal educational background can undertake preparatory to commencing their degrees. The course aims to develop fundamental reading, writing, technical and research skills in a large cohort of students. It focuses on communicating teacher expectations clearly to students, giving concise and effective feedback that helps students to consistently develop their research skills and improve their work standard over the course of a full year, and introducing students to the culture of tertiary research.

The Introduction to Tertiary Learning course therefore includes:

- an initial diagnostic exercise,
- several intermediary assessment tasks, and
- a final semester assessment.

These are carefully designed so that each task explicitly builds on the previous one, and leads students through the research process from the development of a research question to the production of a fully-formatted academic essay. For example, in the examples included here, the annotated bibliographies assembled in Assignment 2 form the basis of the research work for Assignment 5 (the Research Paper).

Introduction to Tertiary Learning

Assessment 2—Annotated Bibliographies (due 5pm Monday 31 March)

After you have chosen a research paper topic and discussed it in class, it is time to begin your research. This is the phase of the project in which you begin to delve into all of the information available and begin to make decisions about what you will use and why. In the 2-3 weeks leading up to the due date, we will have a number of sessions in class and in the library that will help you to learn to research. Over that time, you will select 3 resources that you think will be useful for your paper and produce 'annotated bibliographies' on each of them. An annotated bibliography requires you to:

– record publishing details in order to make referencing easier later
– identify the main argument/point of a text
– identify the important content of a resource for your research topic
– evaluate the credibility and usefulness of a resource
– list any quotes or paraphrases that will be useful for your topic

Essentially, this assignment involves a 'skim' read of each of the resources in order to make a preliminarily evaluation of their usefulness.

To complete your 3 annotated bibliographies, download a copy of the template, which is available on ITTL web, and fill in all of the information required for each resource.

This assignment will be marked and results returned to you electronically within 10-15 working days.

Marking Criteria: Assignment 2 – Annotated Bibliographies

Name: _____   Marker: _____   Grade: _____

← Level of Student Autonomy →

	Level 0 (Attempt)	Level I (Below pass / bare credit)	Level II (Credit)	Level III (Distinction)	Level IV	Level V…
	Students attempt task but do not achieve minimal requirements	*Students research at the level of a **closed inquiry** and require a **high degree of structure/guidance***	*Students research at the level of a **closed inquiry** and require **some structure/guidance***	*Students research **independently** at the level of a **closed inquiry***	*Students research at the level of an **open inquiry**, within **structured guidelines***	
A. Students embark on inquiry and so determine a need for knowledge/ understanding	❑ Does not articulate the research topic	❑ Research topic ill-defined and articulated with limited clarity	❑ Research topic clear, but in need of refinement	❑ Research topic clearly stated	❑ Research topic clearly stated and very well-defined	❑
Comments						
B. Students find/generate needed information/data using appropriate methodology	❑ Search strategy is not appropriate for an academic context: uses non-discriminating ways of finding materials (ie Google or Wikipedia). ❑ Source list is incomplete, or sources bear little or no relationship to the topic	❑ Search strategy is limited: tends to use non-discriminating ways of finding materials (ie Google or Wikipedia) ❑ Identifies 3 sources, at least one of which bears a general relationship to the topic	❑ Search strategy exploits one or two appropriate methods of finding credible information ❑ Identifies 3 sources that bear a general relationship to the topic	❑ Search strategy exploits one or two appropriate methods of finding quality information for an academic context ❑ Identifies 3 relevant sources	❑ *Search strategy exploits multiple, appropriate ways of finding quality information for an academic context* ❑ *Identifies 3 highly-relevant sources*	❑
Comments						
C. Students critically evaluate information/ data and the process to find/generate it	❑ Does not exercise critical discrimination in the evaluation of information ❑ Does not appear to consider source credibility	❑ Evaluates information/data and the inquiry process using simple prescribed criteria. ❑ May not show awareness of indicators of source credibility and reliability	❑ Evaluate information/data and the inquiry process using prescribed criteria. ❑ Identifies indicators of sources credibility and reliability but may not fully apply them in evaluating data or process	❑ Evaluate information/data and the inquiry process using criteria related to the aims of the inquiry. ❑ Identifies several appropriate indicators of source credibility and reliability and applies them in a generally appropriate fashion	❑ Evaluate information/data and the inquiry process comprehensively using criteria related to the aims of the inquiry ❑ Identifies a wide range of indicators of source credibility and reliability and fully applies these	❑
Comments						

D. *Students organise information collected/ generated*	❑ None, or only basic bibliographic details are recorded (eg title and author)	❑ Bibliographic completeness, accuracy or adherence to Harvard needs a lot of work	❑ Bibliographic completeness, accuracy, or adherence to Harvard need attention	❑ Bibliographic completeness, accuracy, or adherence to Harvard show minor errors	❑ Bibliographic details are complete, accurate and follow the Harvard system	❑
Comments						
E. *Students analyse, apply and synthesise new knowledge*	❑ Does not report accurately on the content of sources consulted ❑ Does not discuss the relevance of the sources to the topic ❑ Does not discuss the relationship to other relevant resources	❑ Some key ideas or peripheral ideas addressed ❑ Relevance of the sources to the topic not made explicit ❑ Relationship to other relevant resources not made explicit	❑ Key ideas isolated, but discussed with limited clarity ❑ Attempts a discussion of the way the sources relate to the topic ❑ Attempts a discussion of the relationship to other relevant resources	❑ Key ideas discussed clearly ❑ Clear discussion of the way the sources relate to the topic ❑ Clear discussion of the relationship with other relevant resources	❑ Key ideas analysed in depth ❑ Comprehensive discussion of the way the sources relate to the topic ❑ Incisive/analytical discussion of the relationship with other relevant resources	❑
Comments						
F. *Students communicate knowledge and the processes used to generate it, with an awareness of ethical, social and cultural issues*	❑ Major problems with spelling, grammar and academic conventions of presentation	❑ Partially conforms to spelling, grammar conventions ❑ Inconsistencies in style, formatting and tone.	❑ Generally conforms to spelling, grammar conventions ❑ Minor inconsistencies in style, formatting and tone.	❑ Generally conforms to spelling, grammar conventions ❑ Minor inconsistencies in style, formatting and tone.	❑ Accurate spelling and grammar ❑ Appropriate and consistent style and tone	❑
Comments						

What you're doing well…	What you need to address for next time…

Introduction to Tertiary Learning

Assessment 5—Research Paper (due 5pm Monday 16 June)

This is the culmination of all your work so far. You will write a research paper that addresses your chosen topic. If all has gone well, you will be:

– synthesising a range of ideas you deem relevant to addressing your topic
– putting forward a coherent line of argument or discussion
– successfully using academic convention, including the Harvard referencing system

Essay structure will be discussed in classes and online in the weeks leading up to the due date. There are a number of readings that touch on the subject also. In addition, there will be an opportunity to 'mark' a number of research papers submitted in this course in previous years. This will give you a really good idea about what a research paper looks like.

You will need to use a minimum of 6 resources for this assignment.

This assignment will be marked and results returned to you electronically within 10-15 working days.

Marking Criteria: Assignment 5 – Research Paper

Name: _____   Marker: _____   Grade: _____

← **Level of Student Autonomy** →

	Level 0 (Attempt) *Students attempt task but do not achieve minimal requirements*	Level I (Below pass / bare pass) *Students research at the level of a closed inquiry and require a high degree of structure/guidance*	Level II (Credit) *Students research at the level of a closed inquiry and require some structure/guidance*	Level III (Distinction) *Students research independently at the level of a closed inquiry*	Level IV (High Distinction) *Students research at the level of an open inquiry, within structured guidelines*	Level V…
A. *Students embark on inquiry and so determine a need for knowledge/ understanding*	❑ Does not articulate the research topic in the paper	❑ Research topic ill-defined and articulated with limited clarity	❑ Research topic clear, but in need of refinement	❑ Research topic clearly stated and parameters well-defined	❑ Research topic clearly stated and parameters very well-defined	❑
Comments						
B. *Students find/generate needed information/data using appropriate methodology*	❑ Search strategy is not appropriate for an academic context: uses non-discriminating ways of finding materials (ie Google or Wikipedia). ❑ Source list is incomplete, or sources bear little or no relationship to the topic	❑ Search strategy is limited: tends to use non-discriminating ways of finding materials (ie Google or Wikipedia) ❑ Identifies at least 6 sources, at least three of which bear a general relationship to the topic	❑ Search strategy exploits one or two appropriate methods of finding credible information ❑ Identifies at least 6 sources that bear a general relationship to the topic	❑ Search strategy exploits one or two appropriate methods of finding quality information for an academic context ❑ Identifies at least 6 relevant sources	❑ Search strategy exploits multiple, appropriate ways of finding quality information for an academic context ❑ Identifies at least 6 highly-relevant sources	❑
Comments						
C. *Students critically evaluate information/ data and the process to find/generate it*	❑ Does not exercise critical discrimination in the evaluation of information ❑ Does not appear to consider source credibility	❑ Evaluates information/data and the inquiry process using simple prescribed criteria. ❑ May not show awareness of indicators of source credibility and reliability	❑ Evaluate information/data and the inquiry process using prescribed criteria. ❑ Identifies indicators of sources' credibility and reliability but may not fully apply them in evaluating information	❑ Evaluate information/data and the inquiry process using criteria related to the aims of the inquiry. ❑ Identifies several appropriate indicators of source credibility and reliability and applies them in a generally appropriate fashion	❑ Evaluate information/data and the inquiry process comprehensively using criteria related to the aims of the inquiry ❑ Identifies a wide range of indicators of source credibility and reliability and fully applies these	❑
Comments						

D. *Students organise information collected/ generated*	❑ None, or only basic bibliographic details are recorded (eg title and author)	❑ Bibliographic completeness, accuracy or adherence to Harvard needs a lot of work	❑ Bibliographic completeness, accuracy, or adherence to Harvard need attention	❑ Bibliographic completeness, accuracy, or adherence to Harvard show minor errors	❑ Bibliographic details are complete, accurate and follow the Harvard system	❑
Comments						
E. *Students analyse, apply and synthesise new knowledge*	❑ Does not report accurately on the content of sources used ❑ Does not discuss the relevance of the sources to the topic ❑ Does not attempt to synthesise information from various sources to discuss own topic	❑ Some key ideas or peripheral ideas from the sources are addressed ❑ Relevance of the sources to the topic not made explicit ❑ Attempts to synthesise information from various sources to discuss own topic, but does so with limited clarity	❑ Key ideas from resources isolated, but discussed with limited clarity ❑ Attempts a discussion of the way the sources relate to the topic ❑ Attempts to synthesise information from various sources to discuss own topic	❑ Key ideas from resources discussed clearly ❑ Clear discussion of the way the sources relate to the topic ❑ Synthesises information from various sources to discuss own topic	❑ Key ideas from resources analysed in depth ❑ Comprehensive discussion of the way the sources relate to the topic ❑ Synthesises information from various sources to discuss own topic and propose further avenues of inquiry	❑
Comments						
F. *Students communicate knowledge and the processes used to generate it, with an awareness of ethical, social and cultural issues*	❑ Major problems with spelling, grammar and academic conventions of presentation	❑ Partially conforms to spelling, grammar conventions ❑ Inconsistencies in style, formatting and tone.	❑ Generally conforms to spelling, grammar conventions ❑ Minor inconsistencies in style, formatting and tone.	❑ Generally conforms to spelling, grammar conventions ❑ Minor inconsistencies in style, formatting and tone.	❑ Accurate spelling and grammar ❑ Appropriate and consistent style and tone	❑
Comments						

What you're doing well…

What you need to address for next time…

Electronic Engineering

Said Al-Sarawi and Brian Ng

Assessment tasks and marking criteria:

- Diagnostic Assessment of Research Skills
- Final Photonics Marking Criteria
- Samples of Marked Work

Said and Brian first employed the RSD in the research project component of a Photonics course (part of a Masters by Coursework degree) in 2006. Their use of the RSD in this course included:

- a diagnostic exercise similar to that developed by Eleanor Peirce and Mario Ricci in Human Biology, in which students compiled notes from two sources with differences in style and depth; and
- a final literature review paper.

Since 2007, Brian and Said have used the RSD framework similarly in other contexts in Electronic Engineering, including assessment of Honours projects and examination of Masters by Research theses. Their rationale for using the RSD framework is primarily based on assessment for research projects, and they aim to develop a full suite of RSD-based assessment rubrics by Semester 1, 2010. Their use of the RSD framework to develop explicitly worded marking rubrics for a variety of (mostly written) assessment tasks is similar to that of many other project team members. However, their simultaneous use of the RSD as the basic theoretical framework on which to construct all the assessment rubrics is much more extensive than other project team members' has been.

Generic Research Skills

Week 5 group meeting – Tuesday 22nd August 2006

Background/Rationale

As your academic studies progress, you are increasingly required to acquire valuable research skills to match your technical knowledge. Two key attributes that we strive to impart on University of Adelaide graduates are: 1. the ability to locate, analyse, evaluate and synthesise information from a wide variety of sources in a planned and timely manner, and 2. a commitment to continuous learning and the capacity to maintain intellectual curiosity throughout life (full document is available at: http://www.adelaide.edu.au/dvca/students/Uni%20Graduate%20Attributes.pdf). These attributes are in accord with the research-intensive nature of this University.

In the course Photonics for Communications, the research component is a significant part of the course. The pace of technological advancement is rapid in engineering, and it is important that you acquire strong research skills in order to prepare for your career ahead. As part of your research, you will be required to read and interpret various sources of information, critically evaluate and synthesize them into a coherent story, and effectively communicate ideas and findings in the form of a written report. All of these requirements assume at least a basic level of skill in accessing and critically analysing discipline-appropriate literature.

The short task that you are asked to undertake has two aims. Firstly, it will give you some practice in recognising, extracting and logically organising key points from literature available on a topic. Secondly, the exercise will help you to identify a suitable project topic. The supervisor will be able to provide an adequate level of feedback for your work as well as guidance on the developing your project topic.

Broad Topic Areas

- Silicon Photonics
- Optical Communications
- Nonlinear Optics
- Photonics for Biomedical Imaging
- Optical Data Storage

You are required to first commence your reading in *one* of these broad areas, and subsequently narrow down your topic to greater specificity as you progress.

Valuable Resources

Barr-Smith Library (books)

Journals, in particular:

1. IEEE (online library: http://ieeexplore.ieee.org/Xplore/dynhome.jsp)
2. SPIE (online library: http://www.spiedl.org/);

Task Instructions:

Select **two** articles on photonics and complete tasks 1 and 2.

3. *Integrate the information presented in the two articles to write your own dot-point notes on the worksheet attached.* To do this:

   - Identify 3-4 key ideas from the articles
   - Identify 6-10 potentially interesting/useful references from the articles
   - Use these key ideas to formulate headings
   - Make bullet-point notes and list them under these headings.
   - After each point, indicate its source, i.e. whether the idea came from article 1, article 2, or both (this means you will need to have full bibliographic information of the sources at the end of your notes)
   - Provide a title that embodies the content of your notes.

Submit your written response by **Friday, 1 September**. An example rubric for assessment of this exercise is attached with this document. The "indicators" column clearly shows what is **expected** of you as researchers; the level you achieve depends on the quality of your work.

If you need help to acquire articles, or have general enquiries, feel free to contact me.

Brian Ng

22 August, 2006

Generic Research Skills: Week 5 meeting

Student Name: …………………………………………….   ID number:

…………………………………………..

Title: ....

RSD

Assessment Criteria for Generic Research Skills Exercise

Student Name: _____   Student ID: _____

Marker: _____

Indicators	Level 1	Level 2
The student with research skill …	Student engages with a closed enquiry and requires a high degree of structure and guidance	Student engages with a closed enquiry and requires some structure and guidance
A. **embarks on inquiry** and so determines a need for knowledge/ understanding	❑ Identifies some peripheral or duplicated ideas as key	❑ Identifies KEY ideas
B. **finds/generates** needed information/data	❑ Points/notes generated partially relate to the headings under which they are listed ❑ Notes produced are sourced predominantly from 1 text only	❑ Points/notes generated elaborate on the key ideas to which they are linked ❑ Notes produced draw on ideas from both texts
C. **critically evaluates** information/data and the process to find/generate	❑ Identifies indicators of source credibility and reliability but does not fully apply them in evaluating data or process	❑ Identifies several relevant indicators of source credibility and reliability and provides appropriate rationale for usage/inclusion of information
D. **organises** information collected or generated	❑ Has attempted a note-taking framework, but information is organised predominantly as a list of undifferentiated bullet points	❑ Uses a hierarchical note-taking framework that organises related information under the appropriate key headings.
E. **synthesises and analyses** new knowledge	❑ Produces point form notes (information not directly copied or sentence format) but notes separated according to source	❑ Combines and integrates ideas/data from different sources to generate notes
F. **applies and communicates** knowledge with understanding and acknowledges cultural, ethical, economic, legal and social issues	❑ Title is present ❑ Partial and/or incorrect acknowledgement of sources of information	❑ Title relates clearly to the key ideas presented in the notes ❑ Full and correct acknowledgement of sources of all noted information

Electronic Engineering Masters Program: Marking Criteria for Photonics Paper

Student Name: _____ Student Number: _____

Marker: _____

← ——————————————— Level of Student Autonomy ——————————————— →

	Level 1 *Students research at the level of a **closed inquiry*** *and require a **high degree of structure/guidance***	Level 2 *Students research at the level of a **closed inquiry*** *and require a **moderate degree of structure/guidance***	Level 3 Students research **independently** at the level of a closed inquiry*
A. *Students embark on **inquiry** and so determine a need for knowledge/ understanding*	❑ Significance of the paper is stated, but not based on leads from, or gaps in, the literature	❑ Significance of the paper is stated explicitly and is based on leads from, or gaps in, a limited number of references	❑ Significance of the paper is stated explicitly, and is based on leads from, or gaps in a substantial number of sources
B. *Students find/generate needed information/data using appropriate methodology*	❑ A limited search strategy, demonstrated by a narrow range of sources, eg 1 or 2 different journals. ❑ Paper is partially on-topic, but does not keep its focus and/or is based on unreliable sources	❑ Search strategy uses several different sources *types*, e.g. journals and books ❑ Paper generally keeps its focus, and/or is based on several sources of variable reliability	❑ Quality search strategy demonstrated by multiple source *types* ❑ Paper is highly focused and draws on a range of reliable sources
C. *Students critically **evaluate** information/data and the process to find/generate*	❑ Implies/confers equal status to unbacked assertions and evidence-based findings	❑ Distinguishes unbacked assertions from evidence- based findings	❑ Distinguishes between the quality of different evidence-based findings
E. *Students organise information collected/ generated*	❑ Logical structure is missing / inappropriate. Missing/modifications _____ _____ _____	❑ Logical structure is present / appropriate, yet only partially coherent Suggestions _____ _____ _____	❑ Logical structure is present / appropriate, and has a high level of coherence _____ _____ _____
F. *Students synthesise and **analyse** new knowledge*	❑ Limited synthesis of literature ❑ Literature restated with minor analysis _____ _____ _____	❑ Literature is well synthesised ❑ The literature is compared <u>or</u> contrasted _____ _____	❑ The synthesis of the literature produces a novel understanding or perspective ❑ The literature is compared <u>and</u> contrasted _____ _____
G. *Students communicate knowledge and understanding and the process used to generate them*	❑ Title is present but provides minimal information about the paper ❑ Some referencing, but does not follow the appropriate conventions	❑ Title portrays a general or limited sense of the paper ❑ Appropriate referencing style is applied, but with some errors	❑ Title succinctly portrays the full dimensions of the paper ❑ Appropriate referencing style is applied consistently

(left margin, vertical) Facet of Inquiry

* Inquiry may range from closed (lecturer specified) to open (student specified) in terms of: i) question, hypothesis or aim of research; ii) procedure or equipment; iii) answer, resolution or further inquiry.

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Student name and identifying details removed.

Generic Research Skill

Title: Semiconductor Optical Amplifier Technology and Application

Structure and Characteristics of SOA
- Consist of amplifying medium inside a resonant cavity [1]
- Works like Fabry-Perot laser diode [1]
- Two types: Resonant SOA and Travelling-wave SOA [1]
- Amplification achieved by externally pumping the energy level of material using current [2]
- Gain is influenced by input signal and noise of SOA [2]
- Gain saturation occurs if input signal power is high [2]

Non-linearities of SOA
Cross gain modulation (XGM)
- Strong signal at one wavelength affects the gain of a weak signal at another wavelength [2]
- Caused by carrier density changes [2]
Cross phase modulation (XPM)
- Phase and gain of optical wave propagating are coupled via gain saturation [2]
- XPM can be used to create wavelength converters [2]
Four-wave mixing (FWM)
- Occur in SOA between two optical fields [2]
- Injected fields cause gain to be modulated at beat frequency, and create a new field [2]
- Useful for wavelength converters, dispersion compensators and optical demultiplexers [2]

Application of SOA
Amplifiers
- Such as booster amplifier, preamplifier and in-line amplifier [2]
- To increase high power input signal prior to transmission (booster), to increase receiver sensitivity via increasing power level (preamp), and to compensate for fibre loss (in-line) [1&2]
Optical gates
- SOA can be constructed as optical gate (or switch) with high-speed switching capability that is required by high-speed optical communication network nowadays [1&2]
- Can be integrated into gate arrays for high density switching [1&2]
Wavelength converters
- SOA can be used in optical time division demultiplexer and add/drop multiplexer in optical network [2]
Optical clock recovery
- High-speed clock recovery is best achieved by optical solution [2]
- Uses phase locked loop with SOA based interferometric switch [2]

Electronic Engineering Masters Program: Marking Criteria for Photonics Paper

Student Name: _____Name Removed_____   Student Number: _____   Marker: _____ B. W. Ng_____

← Level of student autonomy →

Facet of Inquiry	Level 1 — Students research at the level of a *closed inquiry** and require a **high degree of structure/guidance**	Level 2 — Students research at the level of a *closed inquiry** and require a **moderate degree of structure/guidance**	Level 3 — Students research **independently** at the level of a **closed inquiry**
A. *Students embark on inquiry* and so determine a need for knowledge/ understanding	❑ Significance of the paper is stated, but not based on leads from, or gaps in, the literature	✔ Significance of the paper is stated explicitly and is based on leads from, or gaps in, a limited number of references	❑ Significance of the paper is stated explicitly, and is based on leads from, or gaps in a substantial number of sources
B. *Students find/generate* needed information/data using appropriate methodology	✔ A limited search strategy, demonstrated by a narrow range of sources, eg 1 or 2 different journals. ❑ Paper is partially on-topic, but does not keep its focus and/or is based on unreliable sources	❑ Search strategy uses several different sources *types*, e.g. journals and books ✔ Paper generally keeps its focus, and/or is based on several sources of variable reliability	❑ Quality search strategy demonstrated by multiple source *types* ❑ Paper is highly focused and draws on a range of reliable sources
C. *Students critically evaluate* information/data and the process to find/generate	❑ Implies/confers equal status to unbacked assertions and evidence-based findings	✔ Distinguishes unbacked assertions from evidence- based findings	❑ Distinguishes between the quality of different evidence-based findings
E. *Students organise* information collected/ generated	❑ Logical structure is missing / inappropriate. Missing/modifications _____ _____ _____ _____	✔ Logical structure is present / appropriate, yet only partially coherent Generally shows good structure, but some sections should be rearranged in a more logical manner.	❑ Logical structure is present / appropriate, and has a high level of coherence _____ _____ _____ _____ _____
F. *Students synthesise and analyse* new knowledge	✔ Limited synthesis of literature ✔ Literature restated with minor analysis The number of sources is adequate, but the variety is very limited. Also, there are some sources of dubious quality.	❑ Literature is well synthesised ❑ The literature is compared <u>or</u> contrasted _____ _____ _____ _____	❑ The synthesis of the literature produces a novel understanding or perspective ❑ The literature is compared <u>and</u> contrasted _____ _____
G. *Students communicate* knowledge and understanding and the process used to generate them	❑ Title is present but provides minimal information about the paper ✔ Some referencing, but does not follow the appropriate conventions	✔ Title portrays a general or limited sense of the paper ❑ Appropriate referencing style is applied, but with some errors	❑ Title succinctly portrays the full dimensions of the paper ❑ Appropriate referencing style is applied consistently

Grade: _____

Additional Comments:

This paper is a reasonable effort. It has a very good start but fell away as the paper progressed – refer to specific comments below. The use of referencing is inadequate (after the introduction). Almost all the diagrams are taken from other sources without explicit acknowledgment, which is unacceptable. In addition, there are numerous instances in which claims are not substantiated or cited – this is also unacceptable practice. Style-wise, the IEEE convention for equation numbers is right-alignment. More generally, the writing style is appropriate but readability is heavily affected by grammatical errors which litter the paper. These aspects need addressing. Overall, the paper is readable and contains patches of excellent information, but it would be significantly improved if some fundamentals of paper writing are addressed.

Specific comments:

A strong introduction – well-structured and manages to capture the interest of the reader via background and history.

Section II.A provides the theoretical principles of non-linear optics. For a review paper, it is quite detailed in its mathematical derivation, which is positive. Beyond II.A, the paper loses some focus and wanders a little. For example, it is not easy to appreciate the logical separation of II.B Second Harmonic Generation and II.C Nonlinear Devices, for a SHG is itself a non-linear device.

Section III focuses on solid state lasers (inappropriate section title – omit the "Materials"). Information in this section is scarce – there are now significantly more than just the two types of common solid-state lasers as described in the paper. In fact, surveying the field of solid-state lasers is a very challenging task in itself, and perhaps should have been attempted with a different approach

Student Name: _____**Name Removed**_____   Student Number: _____   Marker: _____ **B. W. Ng**_____

← ——————————————————— **Level of Student Autonomy** ——————————————————— →

	Level 1 *Students research at the level of a **closed inquiry*** *and require a **high degree of structure/guidance***	**Level 2** *Students research at the level of a **closed inquiry*** *and require a **moderate degree of structure/guidance***	**Level 3** Students research **independently** at the level of a **closed inquiry***
A. Students embark on inquiry *and so determine a need for knowledge/ understanding*	❑ Significance of the paper is stated, but not based on leads from, or gaps in, the literature	✔ Significance of the paper is stated explicitly and is based on leads from, or gaps in, a limited number of references	❑ Significance of the paper is stated explicitly, and is based on leads from, or gaps in a substantial number of sources
B. Students find/generate *needed information/data using appropriate methodology*	❑ A limited search strategy, demonstrated by a narrow range of sources, eg 1 or 2 different journals. ❑ Paper is partially on-topic, but does not keep its focus and/or is based on unreliable sources	❑ Search strategy uses several different sources *types*, e.g. journals and books ❑ Paper generally keeps its focus, and/or is based on several sources of variable reliability	✔ Quality search strategy demonstrated by multiple source *types* ✔ Paper is highly focused and draws on a range of reliable sources
C. Students critically evaluate *information/data and the process to find/generate*	❑ Implies/confers equal status to unbacked assertions and evidence-based findings	❑ Distinguishes unbacked assertions from evidence- based findings	✔ Distinguishes between the quality of different evidence-based findings
E. Students organise *information collected/ generated*	❑ Logical structure is missing / inappropriate. Missing/modifications _____ _____ _____ _____	❑ Logical structure is present / appropriate, yet only partially coherent Suggestions _____ _____ _____ _____	✔ Logical structure is present / appropriate, and has a high level of coherence Logical structure is excellent. Minor suggestions are listed below.
F. Students synthesise and analyse *new knowledge*	❑ Limited synthesis of literature ❑ Literature restated with minor analysis _____ _____ _____	❑ Literature is well synthesised ❑ The literature is compared <u>or</u> contrasted _____ _____ _____	✔ The synthesis of the literature produces a novel understanding or perspective ✔ The literature is compared <u>and</u> contrasted Excellent job at collecting information from literature and producing an independent account of the field.
G. Students communicate *knowledge and understanding and the process used to generate them*	❑ Title is present but provides minimal information about the paper ❑ Some referencing, but does not follow the appropriate conventions	❑ Title portrays a general or limited sense of the paper ✔ Appropriate referencing style is applied, but with some errors	✔ Title succinctly portrays the full dimensions of the paper ❑ Appropriate referencing style is applied consistently

Facet of Inquiry (left margin vertical label)

* Inquiry may range from closed (lecturer specified) to open (student specified) in terms of: i) question, hypothesis or aim of research; ii) procedure or equipment; iii) answer, resolution or further inquiry.

Grade: _____

Additional Comments:

Very well-written, if brief, summary of semiconductor laser modulation. The material presented is fused from numerous, high quality sources. The writing style is excellent, and the material is always presented with logic, which makes the paper easy to follow. The only criticism regarding the style is in the apparent use of diagrams from sources, which are not always cited appropriately. Apart from this minor misdemeanour, the paper is of a high quality and the writer should be commended.

With regard to the topic, I am mildly surprised that there is such a heavy emphasis on analogue modulation of lasers, especially since digital systems have been encroaching into most communication applications. It will certainly be interesting if developments described in this paper will shift the balance between analogue-vs-digital solutions in a number of applications cited in the paper (radar, phased arrays ... etc). Another suggestion is perhaps spelling out more clearly the expected directions of research in this field, in particular bringing the reader's attention to the great existing gaps in knowledge.

Specific comments:

Excellent introduction – the motivation and structure of the paper is clearly presented.
Section II provides the fundamental background for lasers, and in particular, semi-conductor lasers. The writing is again clear but is lacking appropriate citations.

Section III describes and compares three different types of semi-conductor lasers – Fabry-Perot, Distributed feedback and Vertical-cavity Surface-emitting laser diodes. The explanation of their operating principles are clear, although the VCSEL is not illustrated whereas FP and DFB are. Section III.D gives a brief, direct comparison of the three laser types.

Section IV describes some key performance measures when discussing the use of lasers in analogue applications. A minor criticism is perhaps the use of slightly dated reference when quoting some performance numbers. However, the key concepts are conveyed with great clarity and logic.

Section V is very brief – perhaps as a consequence of the lack of variety in methods of direct analogue modulation. A query over eq.(10) – is the bracket in the right place? For FM, the modulating signal should be inside the sinusoidal term. From an organisation point of view, given the relative lack of variation in direct modulation techniques, it would be advisable to combine sections V and VI into a single section. Section VI discusses external modulation techniques based on two different physical principles: interferometry and electroabsorption. The contrast between these two is clearly presented, although it appears that the relative advantage of EA over interferometric modulators can disappear with discovery of new materials/manufacturing techniques.

Business Ethics in a Global Context

Jan Schapper

Assessment tasks and marking criteria:

- Individual Research Report and marking criteria

Dr Jan Schapper first grew interested in the RSD in 2007, because it offered her an effective way to implement research-led teaching in her teaching work. She chose to apply the RSD in her postgraduate course Business Ethics in a Global Context.

Using the RSD in Business Ethics in a Global Context has allowed Jan to:

- formalise her efforts to promote research skills to postgraduate coursework students;
- design assessment tasks to engage students in independent research;
- design assessment tasks that are shared with a wider audience than just the marker, giving them more relevance to the students;
- make explicit the criteria by which students will be assessed;
- be clearer about her own understanding of research skill development; and
- be more creative in the setting of assessment tasks.

In this course, Jan initially developed an initial diagnostic exercise and marking rubric, as well as a major research project and marking rubric. However, the diagnostic exercise was not assessable, and most students did not attempt it. In 2009 Jan therefore dropped the diagnostic exercise and only used the RSD marking rubric for the final research project. She is planning to further rework the rubric for this task in the future.

Individual research report

Background

This research assignment provides the opportunity to conduct detailed research into a topic of importance to Business Ethics in a global environment. Although this is an individual research paper, students can choose to work with others to share resources and ideas.

Task

Research the **ethical** and **international/global/cross-cultural** and **business** dimensions of ONE of the following topics:

1. Ethics and business corruption;
2. Ethics and Monash University;
3. Ethics and HRM;
4. Ethics and property rights;
5. Ethics and executive compensation;
6. Ethics and food production.

Students will be expected to

- Clarify which aspect of the topic you are researching – be specific when setting the boundaries. Don't forget you are to include a global perspective to this topic;
- Conduct a review of the academic literature on your selected topic;
- Where necessary conduct a web search of your topic (eg. Monash University, examples of executive remuneration, food production methods; intellectual property statements);
- Where possible, include the primary data you gathered as part of your group project;
- Explain the ethical theories you will use to analyse the topic. Students are encouraged to utilise ethical perspectives from beyond the Western perspective;
- Analyse the topic from the perspective of the selected ethical theories;
- Develop a conclusion about what is ethical and/ or unethical within your selected topic. You will need to use ethics to justify your position.

Note: Because this is a weighty assessment, you will be expected to submit a first draft. Although the draft won't be assessed, I intend to provide generalised feedback to assist with the development of the final document.

Learning objectives: The purpose of this assessment task is for students to analyse some of the competing demands on business when scrutinising the ethics of business activity (Learning objective 4) and to offer critical analysis of ethics in real-world contexts (Learning objective 5).

Marking Criteria: Individual Research Report

Student Name: _____ Student ID: _____ Marker:_____

← Level of Student Autonomy →

Facet of Inquiry	Level 1 *Students research at the level of a closed inquiry and require a high degree of structure/guidance*	Level 2 *Students research at the level of a closed inquiry and require some structure/guidance*	Level 3 *Students research independently at the level of a closed enquiry*	Level 4 *Students research at the level of an open inquiry, within structured guidelines*
A. *Students embark on inquiry and so determine a need for knowledge/ understanding*	❑ Research topic of little relevance to unit being studied ❑ Research questions and aims not clearly stated or inappropriate	❑ Research topic too broad/ not sufficiently clear ❑ Research questions and aims not made explicit	❑ Research topic appropriate/ broad enough to allow detailed analysis ❑ Research aims stated and adheres closely to guidelines	❑ Research topic allows significant enquiry ❑ Research aims focussed and innovative
B. *Students find/generate needed information/data using appropriate methodology*	❑ Search strategy identifies a limited number of relevant sources and/ or limited quality of data and research materials.	❑ Search strategy identifies a few relevant, quality sources	❑ Search strategy includes different approaches for finding quality information sources (eg. library, journal data bases, organisational websites)	❑ Search strategy includes multiple approaches for finding quality information sources (eg. empirical data, library, journal data bases, government reports, organisational websites)
C. *Students critically evaluate information/data and the process to find/generate it*	❑ Little attempt to critically evaluate data or the process used to generate data	❑ Limitations <u>or</u> biases of the research (content/ process/ researcher) are stated	❑ Limitations <u>and</u> biases of the research (content/ process/ researcher) are stated	❑ Evaluation of the whole study design is rigorous
D. *Students organise information collected/ generated*	❑ Data gathered but not presented in appropriate academic writing structure appropriate for research paper. Missing	❑ Data are incorporated into a research paper writing structure but insufficient clear linkage between sections. Poor linkage of	❑ Academic writing conventions are generally followed with coherent flow Areas for improvement:	❑ Academic writing conventions are followed completely
E. *Students synthesise, analyse and apply new knowledge*	❑ Limited synthesis of data on selected research topic with ethics literature ❑ Information restated as description with minor analysis	❑ The data on the selected topic are compared <u>or</u> contrasted with ethics literature ❑ Attempts at analysis, but inappropriate on occasions	❑ The data on the selected topic are analysed from perspective of ethics literature ❑ Analysis of research material is appropriate	❑ Synthesis of data with other studies is rigorous ❑ Analysis of research material is comprehensive
F. *Students communicate knowledge and the processes used to generate it, with an awareness of ethical, social and cultural issues*	❑ Title of research paper is present ❑ Sources are used, but referencing style recommended in the Q manual (ie. Harvard referencing) not applied ❑ Little reference to global perspective	❑ Title portrays a general sense of the study content ❑ Sources are used and sometimes referencing style recommended in the Q manual (ie. Harvard referencing) not applied OR Harvard referencing style is used incorrectly ❑ Has considered either the cultural or global implications of the selected research topic	❑ Title succinctly portrays the full dimensions of the study ❑ A variety of sources is used and referencing recommended in the Q manual (Harvard referencing style) is usually applied AND/OR Harvard referencing style is used correctly ❑ Has considered both the cultural and global implications of the selected research topic	❑ Title succinctly portrays a study from an "original" perspective ❑ A variety of source <u>types</u> is used and Harvard referencing style is applied consistently ❑ Has integrated the cultural and global perspective into research paper

Student's name:

Commentary and result:

Nursing

Frank Donnelly

Assessment tasks and marking criteria:

- Health Numeracy for Nursing – Level 2

Frank Donnelly has used the RSD framework to promote Health Numeracy skills in Nursing courses for several years. In this course, the RSD offers a context for and engagement with a topic that students do not necessarily warm to easily; it also provides a framework for developing numeracy skills for nurses in a synchronised, step-by-step approach for the entire cohort across several years. This is particularly important because the students in the Bachelor of Nursing degree begin clinical work from Week 6 of Semester 1, and need secure, verifiable skill levels to be able to undertake clinical practice safely.

RSD in the Nursing course begins at Orientation with a diagnostic test; Level 1 (introduced in Semester 2 of first year) then uses firm guidelines and clear directions to engage students with numeracy in clinical settings, Level 2 (in Semester 1 of second year) extends the clinical focus and encourages greater research autonomy, and Level 3 (Semester 2 of second year) introduces a more complex research-oriented task.

To date, the Nursing course therefore includes:

- an initial diagnostic task to assess students' numeracy skills;
- a Level 1 exercise in identifying skills, resources, protocols around, and understanding of, heath numeracy;
- a Level 2 exercise in which students interview patients about their medication, evaluate the data obtained, and consider the implications of calculation errors in a clinical context; and
- a Level 3 exercise focussing on evaluation of a drug protocol, with particular consideration of its numeracy protocol.

These are designed so that one task builds all students' numeracy and related research skills to a required level, and the next then moves them on to the next level. Tasks build on each other through the inclusion of related skills and topics.

More tasks may be added at higher levels in the future.

TCN 2A Health Numeracy 2009	Level 2 Students research at the level of a **closed enquiry** and require **some structure / guidance**	Task description
A. Students embark on inquiry and so determine a need for knowledge / understanding	Responds to questions / tasks required by and implicit in a closed inquiry	Students will analyse the medication charts of patients and identify ten medications that require some form of calculation prior to patient administration. Do NOT identify patients in any way. 1
B. Students find / generate needed informational data using appropriate methodology	Collect and record required information/ data using a prescribed methodology from prescribed sources in which the information / data is not clearly evident	Students will use the information from the medication charts to create a table of the 10 <u>different medications (at least one each of O, S/C, IV, IM).</u> Table headings will be: • Generic name • Brand name • Usual dosage • Patients dosage • Route • Indications 2
C. Students critically evaluate informational data and the process to find / generate this information / data	Evaluate information / data and the inquiry process using prescribed criteria	Students will evaluate the tabulated data to determine which numerical operation is required for administering each drug (i.e. what is the drug calculation required conversion/ multiplication etc). There may be more than one type of operation required. 3
D. Students organise information collected / generated	Organise information using a recommended structure and process	Students will organise the data from the table and identify the most common to least common types of numerical operation. 4
E. Students synthesize and analyse and apply new knowledge	Synthesize and analyse information / data to reorganise existing knowledge in standard formats. Ask relevant researchable questions.	Students will create a pie chart to illustrate the numerical operators required. As a result of the findings suggest a research topic that you might consider useful to improving nursing numeracy skills. 5

F. Students communicate knowledge and the processes used to generate it, with an awareness of ethical social and cultural issues	Use some discipline specific language and prescribed genre to demonstrate self selected knowledge and understanding from a stated perspective and for a specific audience	Students will describe the impact of drug calculation errors on the patient population in a summary of a number of pre-selected journal articles. (500 words) 6

Golbeck, A Ahlers-Schmidt, C Paschal, A Edwards Dismuke, S 2005 'A definition and operational framework for health numeracy', *American Journal of Preventive Medicine*, vol 29, no 4, pp 375-376

A numerical operator is one of the following

A Addition - the process of uniting two or more numbers into one sum, represented by the symbol +.

S Subtraction - the operation or process of finding the difference between two numbers or quantities, denoted by a minus sign (−).

M Multiplication -a mathematical operation, symbolized by $a \times b$, $a \cdot b$, $a * b$, or ab, and signifying, when a and b are positive integers, that a is to be added to itself as many times as there are units in b; the addition of a number to itself as often as is indicated by another number, as in 2×3 or 5×10.

D Division the operation inverse to multiplication; the finding of a quantity, the quotient, that when multiplied by a given quantity, the divisor, gives another given quantity, the dividend; the process of ascertaining how many times one number or quantity is contained in another.

C Converting metric units - a change in the form or units of an expression

S / F Sums involving fractions – manipulation of fractions which are A number that compares part of an object or a set with the whole, especially the quotient of two whole numbers written in the form $^a/_b$.

Conv Converting fraction to percentages - To convert a fraction to a percentage, divide the numerator by the denominator. Then move the decimal point two places to the right (which is the same as multiplying by 100) and add a percent sign.

Calc Calculations involving medications – Calculation the procedure of calculating; determining something by mathematical or logical methods

Oral Health

Cathy Snelling and Sophie Karanicolas

Assessment tasks and marking criteria:

- Wiki and poster assessment

Cathy Snelling and Sophie Karanicolas use the RSD in the first and second years of the Bachelor of Oral Health degree at the University of Adelaide. This program has been working towards developing a consistent culture of research skill development since its establishment in 2002, and is looking at RSD approaches as one way of enabling this.

In 2007, in order to help students develop research skills and begin to see themselves as researchers, Cathy and Sophie redesigned an existing research-based assessment task to incorporate online learning and research tools. They changed the task's final product from an oral presentation to a research-based scientific poster, and constructed a rubric outlining clear levels of performance in the research process. After becoming aware of the RSD framework, they revised the assessment rubric again, using the RSD to rectify perceived deficits in the original. They have since found the concept of 'levels of autonomy' particularly helpful in guiding and developing their students' research capabilities.

The RSD-based rubric for the 'Wiki and poster' assessment task has proven to be an effective guide for students during the research process, and a reliable tool for assessing group research methods and the resultant scientific poster.

Bachelor of Oral Health - Human Biology
Assessment Task - Semester 2 2008
Instructions to Students

Developed by Sophie Karanicolas and Cathy Snelling, School of Dentistry, Faculty of Health Sciences, The University of Adelaide.

Collaborative group work – Developing a wiki and poster presentation assignment.

1. A Wiki on How to Make a Wiki!!!

Cathy and I will begin to construct a collaborative wiki on 'How to Make a Wiki' to model the format of your next assignment for Human Biology.

For the purpose of this project you will:
1. Work in groups of 3
2. Explore and investigate an assigned topic/issue in Human Biology
3. Review your aims and objectives collaboratively
4. Assign group member tasks equitably
5. Develop a wiki of your research findings with support from your designated e-facilitator
6. Frame a research topic/question and design an academic poster to present to a simulated scientific forum, with a summary of your findings
7. Your poster presentation will be accompanied by a 10 minute oral presentation.

2. What is a wiki?

For the technologically savvy amongst us, a wiki is easy to understand, develop and nurture. We have provided a few links to for you to view some pretty amazing wikis. Not that we expect the same level of construction for the purpose of this assignment from you guys, but it may help to view some other wikis to help give you ideas. They look more complex than what they are, and trust me, if Cathy and I can get our heads around them, you Gen Y kids have already got a head start on us. They can be a simple or as complex as you like. The beauty of a wiki is that it becomes a written record of your collaborative group work. My advice for making a wiki... Just do it !!! Click the icons and see what happens. Everyone knows of Wikipedia, right? Well here is a link to view a wiki on the Endocrine System as an example:
http://en.wikipedia.org/wiki/Endocrine_system

Next we have an example from the University of Columbia on Social Justice. This is a favourite of mine and Cathy's.
http://socialjustice.ccnmtl.columbia.edu/index.php/Main_Page

Step 1

Your assigned groups, topics and e-facilitator (Sophie or Cathy) are as follows:

Group 1 The Gag Reflex
Group 2 Physiology of Dental Pain
Group 3 Cementum
Group 4 Endocrine and Exocrine Glands
Group 5 Endocrine System: Negative Feedback
Group 6 Endocrine System: Growth Hormone
Group 7 Endocrine System: Adrenal Glands
Group 8 Stress
Group 9 Diabetes
Group 10 Pregnancy
Group 11 Smell and Taste - Sophie

Step 2
Aims and objectives: you may add to or modify your assigned objectives to make them more suited to your learning preferences, as well as helping to frame your research focus.
The aims and objectives of each poster will be discussed in our F2F session on the assignment on Tuesday 27/7/09

Step 3
Set group roles and assign tasks.

The role of your e-facilitator: Cathy and I will join in on your selected groups to assist you with any queries or concerns you may have. Although we will not add or contribute to the content of your wiki, we may make some suggestions as you are progressing through the different stages on the wiki discussion page or by sending you an email. An example of how the discussion page works can be accessed on
http://boh08.wikispaces.com/message/list/Group+9

Step 4
Find your page in this space under the navigation list.

Step 5
Begin your research and start your collaborative writing. Write down your ideas and information and do not be too concerned about the format or structure of your page as it evolves. There is plenty of opportunity to cut and paste and reframe the page as it develops. That's part of the fun..... Start by clicking the 'edit this page' tab on the right hand side tool box.

Step 6
Click on the Wiki folder in MyUni under **Human Biology I OH Semester 2/Assignments/Wiki Resources** to access the **assessment rubric** that gives you clear and explicit criteria of how you ill be assessed. You will notice that the learning process eg., group work, research skills and wiki

development will be assessed just as equally as your final poster presentation.

Other useful resources found in this folder:
- Links to academic poster formats
- Criteria outlining high quality poster presentations
- Exemplars: Past student posters and poster presentations
- Exemplars; Past student wiki pages eg., http://boh08.wikispaces.com/Group+9

Alternatively you can take the stairs to the fourth floor of the Medical School South Building - Physiology Department- and view the suggested layouts for posters in the corridor or take note of the may Posters displayed around the Dental School and outside our offices. Please be mindful not to disrupt classes whilst you are viewing the layouts.

Remember you can also access the many discipline specialists across the dental school to help you frame a research focus for your topic.

Step 7:
Once you have the final draft of your wiki, refine the content and add inks to pages and external resources. You must reference your wiki content throughout using the Harvard Referencing System. (Refer to your General Studies MyUni folder for a refresher on how to reference accurately).

Whilst in the process of finalising the content and layout of your wiki, begin selecting the information that you will include in your poster.

You poster must include the following elements:
Title and authors
Aims and objective, research focus
Introduction
Content to include diagrams or any graphs etc.
Summary and any acknowledgments etc...
The University of Adelaide Logo

Step 8:
Your e-facilitator will upload your group's poster on MyUni under Human Biology 1 in the assigned area labelled **Poster Gallery**. You will need to prepare a 10-minute oral presentation of your poster and your wiki space to the rest of the class. The date for these presentations is scheduled for the first week in October 2009, in the Wine Centre Gallery. The first year students last year really enjoyed this part of the project - not just because it was at the end - but they were really proud of what they have achieved as a group and it was a chance to showcase their work.

Step 9: Enjoy !!

Group Wiki Collaboration and Project Poster

Student Name: _____ Student ID: _____

Marker: _____

Facet of Inquiry	Student Autonomy Level 1 *Students research at the level of a **closed inquiry** and require a **high degree of structure/guidance***	Student Autonomy Level 2 Students research at the level of a **closed inquiry** and require **some structure and guidance**	Student Autonomy Level 3 Students research **independently** at the level of a **closed inquiry**
A. Students **embark on inquiry** and so determine a need for knowledge/ understanding	❑ Identifies peripheral/duplicated core components of topic ❑ Minimal articulation of core components to oral health practice.	❑ Identifies core components of topic. ❑ Clear articulation of core components to oral health practice.	❑ Identification includes and goes beyond core components of topic. ❑ Comprehensive articulation of core components to oral health practice.
B. Students **find/generate** needed information/data using appropriate methodology	❑ Search strategy is limited to a single source (eg internet only) for finding information. ❑ Content generated is partially relevant to the topic and/or primarily drawn from one or two sources. ❑ Allocation of group roles to manage workflow is minimally identified on the wiki page. ❑ Inequitable distribution of group work contribution with minimal evidence of shared leadership roles.	❑ Search strategy uses several different sources (eg catalogues and databases) for finding information. ❑ Content generated is relevant to the topic, and primarily based on several sources. ❑ Allocation of group roles to manage workflow is identified on the wiki page. ❑ Equitable distribution of group work contribution with evidence of shared leadership roles.	❑ Search strategy includes multiple source types for finding quality information (eg scientific catalogues, library databases, search engines) ❑ Content generated is relevant and draws on a wide range of sources. ❑ Allocation of group roles to manage workflow is clearly detailed and identified on the wiki page. ❑ Equitable distribution of high degree group work contribution and strong evidence of shared leadership roles.
C. Students **critically evaluate** information/data and the process to find/generate this information/data	❑ Identifies indicators of sources credibility and reliability but does not fully apply them in evaluating data or process ❑ Supporting evidence in search strategy only partially supplied and/or inappropriate Missing:_____ ❑ Minimal evidence of a team approach to reviewing, revising and editing group content contributions.	❑ Identifies several relevant indicators of source credibility and reliability and provides appropriate rationale for use/inclusion of information. ❑ Supporting evidence in search strategy supplied but some details inaccurate. Problems with_____ ❑ Evidence of a team approach to reviewing, revising and editing group content contributions.	❑ Identifies a wide range of indicators of source credibility and reliability and fully applies these in selection of data for inclusion. ❑ Supporting evidence in search strategy is extensive and appropriate. ❑ Strong evidence of a team approach to reviewing, evaluating, revising and editing group content contributions.
D. Students **organise** information collected or generated	❑ The group use basic strategies to organise the wiki (eg headings, dot points etc.) but with little flow or connection. Problems with:_____ _____ ❑ The group use basic strategies to organise the poster (eg layout, sections, choice of visuals etc.) with some explanations and basic conclusions. Problems with: _____ _____	❑ The group use several sound strategies to organise the wiki, with linkage between and within most sections. Problems with_____ _____ ❑ The group use several sound strategies to organise the poster with accurate explanations and sound conclusions. Problems with _____ _____	❑ The group use a wide variety of strategies to organise the Wiki with coherent linkage between and within all sections ❑ The group use a wide variety of strategies to organise the poster with accurate and complete explanations and draw distinct conclusions.
E. Students **synthesise, analyse and apply** new knowledge	❑ Content largely restates information from original sources used, with minimal integration. ❑ Poster has a broadly based and superficial coverage, which does not specifically address the chosen learning outcomes	❑ Information from original sources is integrated data but overall theme closely resembles that of the original sources ❑ Poster has broadly based coverage, with detailed information provided for at least one of the chosen learning outcomes.	❑ Content incorporates paraphrasing of information and presents 'new' interpretations/context from that of original sources. ❑ Poster has a focussed and in-depth coverage of all chosen learning outcomes.
F. Students **communicate** knowledge and the process used to generate it with an awareness of ethical, social and cultural issues	❑ Minimal coverage of poster appearance criteria. ❑ Partially conforms to spelling, grammar conventions except for: _____ ❑ Partial/incomplete referencing Missing: _____	❑ Moderate coverage of poster appearance criteria. ❑ Generally conforms to spelling, grammar conventions; minor errors with _____ ❑ Generally well referenced; Problems with _____	❑ Complete and total coverage of poster appearance criteria. ❑ Accurately conforms to spelling/grammar conventions. ❑ Full and correct acknowledgement of all sources used in poster.

Principles in Animal Behaviour, Welfare and Ethics

Susan Hazel

Assessment tasks and marking criteria:

- Chicken & Egg e-Simulation assignment.

In 2008 and 2009, Susan Hazel used the RSD framework in Veterinary Science and Animal Science courses, particularly the Principles in Animal Behaviour, Welfare and Ethics course in 2009. She used the RSD primarily to develop fundamental reading, writing and research skills in a large cohort of first-year students.

Principles in Animal Behaviour, Welfare and Ethics is a Semester 2 core component in the first year of the Bachelor of Science (Animal Science) degree. The course has a strong focus on ethics, and students use the Chicken & Egg e-Sim to discuss and explore ethical issues in animal treatment. Students are required to take on roles as stakeholders in a simulation about battery hen cages, as stakeholders, media or decision makers, then research and critically analyse relevant information and communicate it to others.

While Susan's original work with the RSD framework built on that of Eleanor Peirce and Mario Ricci in Human Biology, her use of the RSD in this course added another dimension – that of dynamic student peer review of research. In the 'Chicken & Egg' assignment, students were required to research information and present it in the e-Sim, in interaction with their peers, to support their arguments; if their research was incomplete, outdated or ineffective in supporting their argument, other participants in the e-Sim would counter-argue using their own research.

Assessment tasks using RSD in the course were:

- participation in the e-Sim;
- an interim report written during the e-Sim; and
- a reflective report on learning that occurred during the e-Sim.

Susan used the RSD to help students identify areas in which they could improve their work, and to encourage them to focus on ethical issues inherent in the research topic (Facet F: 'Students communicate knowledge and the process used to generate it with an awareness of ethical, social and cultural issues') in the reflective report.

Chicken & Egg e-Simulation[1]

The aim of this e-Simulation is to enable students to deeply understand a controversial issue relating to animal welfare and the way we, as a society, determine the way animals will be treated. The battery cage chicken will be used as the example for this assessment. A scenario will be presented relating to the development of battery cage chicken sheds north of Gawler. Students will select a group to represent in the scenario (stakeholder, media or decision-maker) and a Public Inquiry will be held with submissions by each stakeholder group. At the end of the Public Inquiry the decision-maker group will make a final decision on whether or not the development should go ahead, and groups will then have time to interact with the decision-maker group to determine how this decision was reached. Students will then exit from their roles and debrief in tutorial classes to discuss what they have learnt from the e-Sim.

The components of assessment relating to the Chicken & Egg e-Sim are:

1. Quizzes (5%; individual)

The online quizzes will be put up on MyUni. There will be two quizzes, one relating to egg production and the other relating to the relevant organisations in the e-Sim. Students will have the chance to practice the quizzes as many times as they like, with the mark at the time of the deadline counted towards the assessment. Note that the quizzes are open book, but must be completed without the assistance of anybody else.

2. Chicken & Egg e-Sim Participation

Objective

Participation in the Chicken & Egg e-Sim will enable students to experience how decisions

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Communication

The basis of the e-Sim is for groups to interact with other personae. This interaction will provide the experiences that you will draw your learning from, and provide the data and information you will need to complete the final debriefing report.

All information flow through the e-Sim will be via email, public inquiry discussion boards, news events (discussion board), online chats and informal channels. All personae should use the various communication channels to try to influence the direction of the e-Sim and the decisions that will be made. Individual persona control the release of information through email and the public inquiries, but

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[1] The Chicken & Egg e-Sim has been based on the Mekong e-Sim developed by Professor Holger Maier in the School of Civil, Environmental & Mining Engineering. The assistance of Professor Maier and his team is gratefully acknowledged. The notes for the Chicken & Egg e-Sim are modified from the Course Information Pack relating to the Mekong e-Sim.

the media (with lobbying from personae) control which information is released through news events. Email should only be used to correspond with several relevant personae. Blanket emails to ALL personae are **not allowed** and constitute spamming. If you wish to broadcast these types of information you should contact the media groups to communicate via news events.

All personae should adopt a communication strategy relevant to their own group, but all information channels may not be equally appropriate for all personae. For example, some personae who have highly newsworthy public inquiry submissions or who make high impact decisions may focus on news events, while other groups spread their participation across all information channels. The assessment mark for participation will also reflect how well the persona was able to utilise appropriate information channels to promote their role. A separate peer assessment process may be used if necessary to account for any differences in the performance of group members within a persona.

Email
All emails should be sent to groups (personae) from the Moodle website, not to individuals within a group. Subject headings should include the name of the persona(e) to receive the emails, followed by the subject of the email (e.g. "To AA: Beak trimming). To send an email, go to [address redacted]. A copy of every email sent between personae will also be copied automatically to the e-Sim facilitator. Both the quantity and quality of emails will be assessed.

Discussion Boards
Discussion boards are the main form of communication used in the Chicken & Egg e-Sim. Separate Discussion Boards for the Public Inquiry, Media Releases and News Articles will be set up.

News Events
News events should be submitted to the media groups, and the media personae should also seek out news stories from the other groups. Persona will be assessed on their ability to seek out newsworthy information relevant to their readership will be assessed.

3. **Public Inquiry Submission/ Media Stories/ Decision (7.5%; group mark)**

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bjectives

As part of this assessment task you will develop a deeper understanding of some specific issues that are relevant to your personal in the e-Sim. Each persona group has a different topic of research which is relevant to their particular position. These topics will be released into the group area for your persona at the beginning of the interaction stage. The types of submissions required for the media, non-media and decision-maker groups will vary, as outlined below.

Non-Media Groups

The submission will consist of two parts:

Part 1: A 1000 word paper on the topic provided to each group. This report is expected to be well researched and referenced appropriately for the type of information presented.

Part 2: A 400 word summary of the 1000 word paper that provides the group's position with regard to the terms of reference of the public inquiry. This must be posted by the group to the public inquiry discussion board. This submission should still be based on the well-researched facts presented in the 1000-word submission, but the style should be different as it is an argument to the public inquiry to persuade the decision-makers.

Media Groups

A minimum of five articles of ~250-300 words each are required. These articles should be spaced throughout the e-Sim. Note that there are additional submissions required as the media groups will not be submitting to the public inquiries. The articles will be published on a discussion board specifically for media articles. As a media group you may comment on issues raised in the public inquiries.

Decision-Maker Group

The decision-maker group must write a report to justify the decision they make, which will be posted to the appropriate public inquiry forum after the conclusion of the Public Inquiry phase. The word limit is 1000 words. It is recognised that the time frame you have to prepare this document is short, and this will be taken into account during the assessment.

4. Debriefing Report (20%; individual mark)

Objective

The debriefing report is used to illustrate your understanding of the complexity in decision-making relating to animal welfare. You should draw upon your own experience within the e-Sim, plus any face-to-face debriefings.

Write a reflective report addressing the question:

Based on **your experience** of participating in the Chicken & Egg e-Sim, what are the main factors affecting the decision-making processes for the intensive production development project?

The suggested format for your debriefing report is:

Introduction:
- *General description of your persona,*
- *Course and group composition*

Policies:
- *To what extent were the policy objectives outlined in your role profile achieved?*
- *What were the main reasons that impacted upon you achieving your objectives?*

Group Dynamics:
- *How have you utilised the diversity in backgrounds and skills of the members of your group? Was there any conflict within your group?*

- *What do you think the main reasons for this conflict were, and how did you try to resolve any conflict?*

e-Sim:
- *Do you feel that the Chicken & Egg e-Sim represented the complexity of decision-making in matters relating to the way we treat animals?*
- *How would you improve the e-Sim to better represent the situation and improve your satisfaction and learning?*

The word limit is 1,500 words.

Summary of Tasks Relating to the Chicken & Egg e-Sim up to the Mid-Semester Break

Columns are grouped in weeks of 7 days (M T W T F S S), Weeks 1–8. █ = scheduled (green), ø = milestone marker.

Task	W1 M	T	W	T	F	S	S	W2 M	T	W	T	F	S	S	W3 M	T	W	T	F	S	S	W4 M	T	W	T	F	S	S	W5 M	T	W	T	F	S	S	W6 M	T	W	T	F	S	S	W7 M	T	W	T	F	S	S	W8 M	T	W	T	F	S	S
Read Course Information	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█		
Read e-Sim Background Papers	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█							
Check e-Sim Website	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█							
Weekly Quizzes							█							█																																										
Announcement of Public Inquiry																													ø																											
Announcement of PI Topics																													ø																											
Interact with other groups																													█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Read Discussion Boards																													█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Media Groups																																																								
Interview e_Sim participants																													█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
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Decision Maker Groups																																																								
Prepare for public enquiry																													█	█	█	█	█																							
Run public enquiry																																				█	█	█	█	█	█	█	█	█	█	█	█								
Announce decision																																																	ø						
Post replies to questions																																																	█	█	█	█	█		
Other Groups																																																								
Prepare PI paper																													█	█	█	█	█		ø																					
Prepare PI submission																													█	█	█	█	█		ø																					
Participate in PI																																				█	█	█	█	█	█	█	█	█	█	█	█	█								
Post questions to decision makers																																																	█	█	█	█	█		
Debrief Session																																																								
Complete Debreifing Report																																																								

Summary of Tasks Relating to the Chicken & Egg e-Sim following the Mid-Semester Break

Task	Week 9							Week 10							Week 11							Week 12						
	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
Read Course Information	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Read e-Sim Background Papers																												
Check e-Sim Website																												
Weekly Quizzes																												
Announcement of Public Inquiry																												
Announcement of PI Topics																												
Interact with other groups																												
Read Discussion Boards																												
Media Groups																												
Interview e_Sim participants																												
Write and post articles																												
Decision Maker Groups																												
Prepare for public enquiry																												
Run public enquiry																												
Announce decision																												
Post replies to questions																												
Other Groups																												
Prepare PI paper																												
Prepare PI submission																												
Participate in PI																												
Post questions to decision makers																												
Debrief Session				ø																								
Complete Debreifing Report				█																				ø				

Assessment Rubric

Non-Media Groups Public Inquiry Submission

	Level 1 (<50)	Level 2 (50-64)	Level 3 (65-74)	Level 4 (>75)	Level 5 (>85)
A. Students **embark on inquiry** and so determine a need for knowledge/understanding	o Aim of submission not stated	o Aim of submission stated, but unclear	o Aim of submission clear and adequately reflects persona objectives	o Aims of submission clear and substantially reflects persona objectives	o Aims of submission clear, and goes beyond material given to persona
B. Students **find/generate** needed information/data using appropriate methodology	o Sources of information inadequate compared with those available	o Sources of information minimally cover those available	o Several sources of information used covering most of those available	o Multiple sources of information reflecting information available	o Multiple sources of information used including some originality in searching
C. Students **critically evaluate** information/data and the process to find/generate this information/data	o Insufficient and/or inaccurate information	o Limited but correct information	o Adequate and accurate information	o Extensive and accurate information to back up argument	o Extensive and accurate information with presentation of multiple lines of argument
D. Students **organise** information collected or generated	o Errors in spelling/grammar o Poor organisation and low readability	o Spelling/grammar mostly correct o Adequate organisation and readable	o Spelling/grammar correct o Good organisation and readability	o High level of language used and high clarity and readability	o Excellent use of language and professional level of clarity and readability
E. Students **synthesise, analyse and apply** new knowledge	o Limited evidence of ability to construct coherent argument	o Sound argument based on evidence	o Well-reasoned argument based on wide evidence	o Some evidence of imagination, flair, originality and independent thought	o Demonstration of imagination, flair, originality and independent thought
F. Students **communicate** knowledge and the process used to generate it with an awareness of ethical, social and cultural issues	o Submission does not reflect the perspective of the persona o Partial/incorrect reference list provided	o Submission partially reflects the perspective of the persona o Limited referencing and/or incorrect referencing style	o Submission reflects the perspective of the persona o Adequate sources used and correct referencing style	o Submission reflects the perspective of the persona and considers some ethical, social and cultural issues o A variety of sources used and referencing style correct	o Submission reflects the perspective of the persona and considers in details other ethical, social and cultural issues o A variety of source types used and referencing style correct

RSD

Assessment Rubric

Media Groups Articles

	Level 1 (<50)	Level 2 (50-64)	Level 3 (65-74)	Level 4 (>75)	Level 5 (>85)
A. Students **embark on inquiry** and so determine a need for knowledge/ understanding	o Article of no interest to other personae	o Article of limited interest to other personae	o Article of some interest to other personae	o Article of interest with impact on other personae	o Article of strong interest with significant impact on other personae
B. Students **find/generate** needed information/data using appropriate methodology	o Sources of information used from outside e-Sim	o Sources of information primarily from inside e-Sim	o Information from one or two sources within the e-Sim	o Information from multiple sources of information within the e-Sim with some engagement of other personae	o Multiple sources of information within e-Sim used with evidence of wide engagement with personae
C. Students **critically evaluate** information/data and the process to find/generate this information/data	o Insufficient and/or inaccurate information	o Limited but correct information	o Adequate and accurate information	o Extensive and accurate information to back up argument	o Extensive and accurate information with presentation of multiple lines of argument
D. Students **organise** information collected or generated	o Errors in spelling/ grammar o Poor organisation and low readability	o Spelling/ grammar mostly correct o Adequate organisation and readable	o Spelling/grammar correct o Good organisation and readability	o High level of language used and high clarity and readability	o Excellent use of language and professional level of clarity and readability
E. Students **synthesise, analyse and apply** new knowledge	o Limited evidence of ability to construct coherent argument	o Sound argument based on evidence	o Well-reasoned argument based on wide evidence	o Some evidence of imagination, flair, originality and independent thought	o Demonstration of imagination, flair, originality and independent thought
F. Students **communicate** knowledge and the process used to generate it with an awareness of ethical, social and cultural issues	o Articles do not refer to ethical, social and cultural issues o Partial reference to sources of information	o Articles include some ethical, social and cultural issues but do not provide any detail of their relevance o Limited referencing to sources of information	o Articles include some ethical, social and cultural issues and their relevance o Adequate reference to sources used	o Articles consider some ethical, social and cultural issues and have some impact on the e-Sim o Several sources used and referenced	o Articles consider ethical, social and cultural issues in detail and have a significant impact on the e-Sim o Multiple sources used reflecting scope of debate within the e-Sim

RSD

Assessment Rubric

Decision-Maker Group Report

	Level 1 (<50)	Level 2 (50-64)	Level 3 (65-74)	Level 4 (>75)	Level 5 (>85)
A. Students **embark on inquiry** and so determine a need for knowledge/ understanding	o Decision does not reflect the main points in the Public Inquiry	o Decision reflects some of the major points raised in the Public Inquiry	o Decision reflects the major points raised in the Public Inquiry	o Decision reflects in detail	o Decision
B. Students **find/generate** needed information/data using appropriate methodology	o Information inadequately references e-Sim events	o Information has limited reference to e-Sim events	o Adequate referencing of limited e-Sim events	o Adequate reference to multiple e-Sim events	o Extensive reference to multiple e-Sim events
C. Students **critically evaluate** information/data and the process to find/generate this information/data	o Insufficient and/or inaccurate information	o Limited but correct information	o Adequate and accurate information	o Extensive and accurate information to back up argument	o Extensive and accurate information with presentation of multiple lines of argument
D. Students **organise** information collected or generated	o Errors in spelling/ grammar o Poor organisation and low readability	o Spelling/ grammar mostly correct o Adequate organisation and readable	o Spelling/grammar correct o Good organisation and readability	o High level of language used and high clarity and readability	o Excellent use of language and professional level of clarity and readability
E. Students **synthesise, analyse and apply** new knowledge	o Limited evidence of ability to construct coherent argument	o Sound argument based on evidence	o Well-reasoned argument based on wide evidence	o Some evidence of imagination, flair, originality and independent thought	o Demonstration of imagination, flair, originality and independent thought
F. Students **communicate** knowledge and the process used to generate it with an awareness of ethical, social and cultural issues	o Decision does not refer to ethical, social and cultural issues o Partial reference to sources of information	o Decision includes some ethical, social and cultural issues but does not provide any detail of their relevance o Limited referencing to sources of information	o Decision includes some ethical, social and cultural issues raised by the e-Sim o Adequate reference to sources used	o Decision considers some ethical, social and cultural issues with a good reflection of issues raised by the e-Sim o Several sources used and referenced	o Articles considers ethical, social and cultural issues in detail with extensive reflection of issues raised by the e-Sim o Multiple sources used reflecting scope of debate within the e-Sim

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Chicken & Egg e-Sim Debriefing Report

Student Name: _____

Marker: _____

	Level 1 (<50)	Level 2 (50-64)	Level 3 (65-74)	Level 4 (>75)	Level 5 (>85)
A. Students **embark on inquiry** and so determine a need for knowledge/ understanding	o Aim of submission not stated	o Aim of submission stated, but unclear	o Aim of submission clear and adequately reflects persona objectives	o Aims of submission clear and substantially reflects persona objectives	o Aims of submission clear, and goes beyond material given to persona
B. Students **find/generate** needed information/data using appropriate methodology	o Inadequate reference to e-Sim events	o Limited reference to e-Sim events	o Adequate reference to e-Sim events, information sourced from limited e-Sim events	o Adequate reference to e-Sim events, information sourced from multiple e-Sim events	o Extensive reference to e-Sim events, information sourced from multiple e-Sim events and from outside the e-Sim
C. Students **critically evaluate** information/data and the process to find/generate this information/data	o Limited discussion of factors	o Discussion of factors in isolation	o Discussion of multiple factors, limited discussion of interactions between factors	o Discussion of multiple factors, detailed discussion of interactions between factors	o Discussion of multiple factors, detailed discussion of interactions between factors with extrapolation to examples outside the e-Sim
D. Students **organise** information collected or generated	o Errors in spelling/ grammar o Poor organisation and low readability	o Spelling/ grammar mostly correct o Adequate organisation and readable	o Spelling/grammar correct o Good organisation and readability	o High level of language used and high clarity and readability	o Excellent use of language and professional level of clarity and readability
E. Students **synthesise, analyse and apply** new knowledge	o Limited evidence of ability to construct coherent argument	o Sound argument based on evidence	o Well-reasoned argument based on wide evidence	o Some evidence of imagination, flair, originality and independent thought	o Demonstration of imagination, flair, originality and independent thought
F. Students **communicate** knowledge and the process used to generate it with an awareness of ethical, social and cultural issues	o Minimal reflection presented o Partial/incorrect reference list provided	o Adequate reflection that does not cover the major issues raised in the e-Sim o Limited referencing and/or	o Good reflection with adequate coverage of the major ethical, social and cultural issues raised in the e-Sim	o Good reflection with good coverage of the major ethical, social and cultural issues raised in the e-Sim o A variety of	o Excellent reflection with extensive coverage of the major ethical, social and cultural issues raised in the e-Sim o A variety of source types used and referencing style correct

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		incorrect referencing style	o Adequate sources used and correct referencing style	sources used and referencing style correct	

Adaptation

Joy McEntee

Assessment tasks and marking criteria:

- Adaptation literature review
- Adaptation major essay

Joy first used the RSD framework in her second- and third- year English course Hollywood or Bust! in 2008. In 2009 she used it again, somewhat differently, in the second- and third- year course Adaptation.

When Joy first encountered the RSD framework she was struck by the manner in which it broke down and analysed a set of skills and behaviours that markers in English often expect, without explicitly articulating those expectations to students or even to themselves. She first used the RSD framework to unpack some of her own assumptions about what students need to do to demonstrate that they're good at "research" in English. This enabled her to think systematically about creating a scaffolded, incremental approach to helping students acquire the research skills they would need to succeed.

For Joy, the strength of the RSD Framework in its original form was its capacity to describe and analyse the staged development of students' research skills in generic terms. However, her experience of discussing rubrics based directly on the original RSD Framework was that it had to be strongly adapted before it became accessible to students in English. She therefore modified the rubric in 2008 by changing the language to make it more accessible to Humanities students, and developing the generic Facet F ('Students communicate knowledge and the processes used to generate it, with an awareness of ethical, social and cultural issues') into a meta-category that articulates the ways in which 'communication' is a fundamental part of every facet of research in English Studies. She refined the rubric again in 2009 on the basis of student feedback.

Assessment tasks using RSD in the Adaptation course were:

- a literature review; and
- a major essay.

Joy's research led her to the view that the most important aspect of feedback is how students use it: any approach that offers the opportunity to stabilise the format in which feedback is given has the potential to maximise students' chances of learning to interpret, use and act on feedback appropriately. In Adaptation in 2009 she therefore incorporated into the major essay a compulsory 'feed-forward' section that required students to engage with feedback on the literature review.

Joy will continue to use the RSD Framework as a 'meta-rubric' to inform her creation of assessment regimes and feedback documents, and to create assessment regimes that help my students advance incrementally towards the development of sophisticated research and communication skills.

Adaptation: Literature Review

Due: 14 April 2009 12 noon
                If you're going away for Easter, you'll just have to plan to get it in earlier.

Word Limit: 1500

Value: 25%

Submit: Hard copy via the English essay box, School Office, Level 7, Napier Building.
                Email submission not accepted.

Objectives: To create the opportunity for constructive feedback to be given to help student prepare for the major essay and

                to help students
                - develop a sophisticated view of the field of knowledge
                - engage with up-to-date scholarship in the field
                - develop their research skills
                - develop confidence in investigating and evaluating new ideas and perspectives
                - sharpen their analytic skills
                - improve skills in written communication
                - learn to handle unfamiliar material (critical readings) and genres (literature review)
                - develop the ability to plan their own work

Instructions: Write a literature review on ONE of the following topics.

                You are expected to consult the readings supplied through MyUni, and to conduct your own independent research.

1. What is 'fidelity discourse' and what are some of the problems that attach to it?
2. How has recent theoretical work on adaptation challenged the old truism that 'the book is usually better than the film?'
3. What is the significance of the 'Word/Image' wars for contemporary studies of adaptation?
4. Will adaptation studies ever be academically 'respectable?' What do accounts of its history indicate?
5. "Adaptation" is a deceptively simple looking word, that turns out to have multiple definitions. Discuss some of the definitions you encounter in your reading, and some of the other words theorists use to capture the complexity of the phenomenon of "adaptation."
6. There is something of a gulf between theorists of adaptation, and its practitioners. Survey and discuss literature about the *practice* of adaptation.

If you like none of the above:
7. A topic you negotiate with your tutor. This topic must be:
   o Negotiated *in advance*
   o Agreed *in writing*
   o Signed off by your tutor/marker *before* you proceed (electronically)

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If you want to pursue this option:

1. email your tutor/marker well ahead of the assignment due date with a proposed topic. Do not assume that this topic has been accepted until your tutor gives you the OK *in writing* (electronic is fine) to proceed.
2. Print out the email correspondence and staple it behind the coversheet of your assignment when you hand it in.

Name:		ID:		Class		Raw score	
Topic				Tues 9	Wed 1	- lateness	
				Wed 10	Thurs 1	= Final mark	

	Attempt below pass	Pass	Credit	Distinction / HD
Compliance with instructions	❑ Failure to comply with instructions ❑ Major elements missing	❑ Incomplete / imperfect compliance with instructions ❑ Elements missing or compromised	❑ General compliance with instructions ❑ All elements present	❑ Complete compliance with instructions ❑ All elements present & clearly labelled
Adequate research basis *Appropriate research effort*	❑ Inadequate research basis ❑ Materials inappropriate or irrelevant to the topic and/or the discipline ❑ Does not exhibit awareness of source credibility	❑ Research basis just adequate ❑ Relevance of some sources to the topic / discipline debatable ❑ May not exhibit awareness of indicators of source credibility or reliability	❑ Solid research basis ❑ Resources generally relevant to the topic and appropriate to the discipline ❑ Exhibits awareness of indicators of source credibility, but may not fully apply them	❑ Research basis strong to extensive ❑ Resources highly pertinent to the topic ❑ Resources reflect current / important critical debates within the discipline ❑ Exhibits acute awareness of issues of resource credibility and reliability
Focus	❑ Attempts to respond to topic, but does not succeed in addressing key elements ❑ Does not identify the topic, or there is a radical mis-match between declared topic and content.	❑ Topic declared ❑ Responds with an approximate degree of relevance to topic, but ❑ May not explicitly or accurately identify key components of topic ❑ Declared topic not explicitly pursued in the body of the literature review or ❑ Declared topic not consistently pursued in the body of the literature review	❑ Topic declared ❑ Responds appropriately to the topic ❑ Identifies key components of topic. ❑ Topic consistently pursued through the body of the literature review	❑ Topic declared ❑ Responds appropriately and insightfully to the topic ❑ Refines the topic provided and constructs an appropriately focussed literature review
Representation, analysis and synthesis of secondary sources	❑ Inappropriate handling / representation of sources cited ❑ Inadequately detailed or inaccurate representation of sources	❑ Superficial response to / analysis of representation of sources ❑ Comparisons between / synthesis of sources may be attempted, but not entirely appropriate or effective. ❑ Integration of ideas from sources not entirely successful	❑ Generally accurate representation of sources, but some inadvertent misrepresentations or misinterpretations evident ❑ Adequately detailed response to / analysis of representation of sources ❑ Profitable comparisons between / synthesis of ideas from sources ❑ Integration of ideas from sources reasonably successful	❑ Cogently identifies key ideas from readings ❑ Sensitively reflects sentiment/ideas of the original sources ❑ Integration of ideas from sources very effective ❑ Acute analysis of / comparison of sources produces very profitable synthesis, including insights new to the field

Organisation & presentation of materials	❑ Does not achieve appropriate literature review format ❑ Elements missing	❑ Literature review format attempted, but effective structure not achieved ❑ Overall structure needs work ❑ Editing for relevance of content needs work ❑ Logical sequencing of ideas needs work	❑ Literature review format generally successfully achieved, but requires refinement: ❑ Overall structure reasonably effective ❑ Articulation of relevance of content reasonably effective ❑ Logical sequencing of ideas reasonably effective	❑ Highly effective literature review construction ❑ Highly effective structure ❑ Effective articulation of relevance of content ❑ Logical and coherent sequencing of ideas
Communication skills	❑ Major presentation problems ❑ Major problems with spelling, grammar and academic conventions ❑ Skills in written communication need work urgently	❑ Adequate presentation ❑ Partially conforms to spelling, grammar conventions ❑ Inconsistencies / inappropriacies in style, formatting and tone. ❑ Skills in written communication need work	❑ Generally appropriate presentation ❑ Generally conforms to spelling, grammar conventions; minor errors ❑ Generally appropriate style and tone ❑ Solid skills in written communication	❑ Professional presentation ❑ Consistently accurate spelling and grammar ❑ Consistently appropriate style and tone ❑ Well -to highly-developed skills in written communication
Citation	❑ Referencing and/or acknowledgement of sources absent or seriously deficient	❑ Citation attempted, but elements missing ❑ Inaccurate formatting of citations leading to difficulty in interpretation ❑ Citation not in Discipline style	❑ Citation information generally complete and formatting generally in Discipline style, but some minor errors in applying conventions	❑ Full and correct citation using the Discipline style

Notes

Things you're doing well now	Things that need work	Priority:		
		High	Medium	Low
		High	Medium	Low
		High	Medium	Low
		High	Medium	Low
		High	Medium	Low
		High	Medium	Low
		High	Medium	Low

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<u>Adaptation</u>: Major Essay

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<u>Due:</u>   15 June 2009 12 noon
       Components: *both* must be present:
       1.   100 word statement outlining how you used feedback on the literature review to improve your essay.
       2.   2500 word essay[2]
<u>Value:</u>   40%
<u>Submit:</u>   Hard copy via the English essay box, School Office, Level 7, Napier Building. *Email submission not accepted.*
<u>Objectives:</u>   to help students
- learn to analyse and meet criteria
- learn to respond appropriately and constructively to feedback
- sharpen their skills in analysis, evaluation and synthesis of ideas and arguments
- learn to construct a sustained argument substantiated with reverence to evidence
- learn to structure a comparative analysis
- develop the ability to plan and execute their own work
- develop their writing skills by producing a substantial document in a prescribed genre (the essay) finished to a highly professional standard

<u>Instructions:</u>   Write an essay on ONE of the following topics:
       (list may be expanded later in the semester):

1. "There are such basic differences between the purely verbal sign system of [literature] and the audio-visual sign system of film that the film is likely to feel very different from the precursor novel [or story]." Discuss this assertion in relation to one of the adaptations studied in the course.
2. Orson Welles said that if a filmmaker didn't have something new to say about a novel or a story he should leave it alone. Consider this view in relation to one of the adaptations studied in the course in which, it seems to you, the filmmaker had "something new to say."
3. Compare the way a novel / story and a film you have studied go about rendering states of mind and/or points-of-view. Articulate the significance of any differences you detect.
4. Examine the narrative structure of one of the films you have studied, comparing it with the structure of the story or novel on which it was based. Consider reasons for and effects of the main narrative changes.
5. Identify an element of a story or novel that critics have labelled "uncinematic" (such as first-person narration or an ironic verbal style) and discuss how filmmakers address the issue in an adaptation on the course.[3]
6. The novel is sometimes said to be all about the development and exposition of 'character.' Examine that fate of 'character' in one of the text/film adaptations in the course.
7. "Identity — the idea of subjectivity— is an entirely different proposition in literature and on screen." (*Joy's Bogus Critics*) Discuss this assertion with reference to one of the adaptations in the course.

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[2] Word limit excludes List of Works Cited, but includes in-text references.
[3] John M. Desmond and Peter Hawkes. *Adaptation: Studying Film and Literature*. New York: McGraw/Hill, 2006. 117.

8. Dialogue is a frequent casualty of the text/film adaptation. Discuss the function of dialogue, and the ways it may change, in any adaptation studied on the course. Don't forget: silence may be important in either medium.
9. A topic you negotiate with your tutor *in advance,* and *in writing* (as per Literature Review instructions).

Name:		ID:	Class		Raw score	
Question			Tues 9	Wed 1	- lateness	
Text / Film			Wed 10	Thurs 1	= Final mark	

	Attempt below pass	Pass	Credit	Distinction / HD
Compliance with instructions	❑ Failure to comply with instructions ❑ Major elements missing	❑ Incomplete / imperfect compliance with instructions ❑ Elements missing or compromised	❑ General compliance with instructions ❑ All elements present	❑ Complete compliance with instructions ❑ All elements present & clearly labelled
Active response to earlier feedback	❑ Rejoinder absent or seriously compromised	❑ Rejoinder present but only superficially responsive or off topic	❑ Rejoinder represents thoughtful, effective response to feedback	❑ Rejoinder represents highly effective response to feedback
Tacit evidence of response to feedback	❑ Does not appear to have paid attention to feedback ❑ No progress or deterioration in performance on issues identified	❑ May have attended to feedback, but ❑ interpretation of feedback may be inappropriate and / or ❑ attempts to improve work may not be entirely effective	❑ Appears to have attended to feedback ❑ Generally appropriate interpretation of feedback ❑ Generally successful application of feedback to improve work	❑ Strong evidence of having used feedback appropriately to achieve a marked improvement in the work.
Question analysis	❑ Attempts to respond to questions/tasks arising explicitly from the essay question, but does not succeed in addressing key elements of the question ❑ Does not identify the question, or there is a radical mis-match between declared question and essay content.	❑ Essay question declared ❑ Responds with an approximate degree of relevance to essay question, but ❑ May not explicitly or accurately identify key components of topic ❑ Declared question not explicitly pursued in the body of the essay or ❑ Declared question not consistently pursued in the body of the essay	❑ Essay question declared ❑ Responds appropriately to the essay question ❑ Identifies key components of topic. ❑ Essay question consistently pursued through the body of the essay ❑ Argument may need to be more explicitly articulated / refined/ clarified	❑ Essay question declared ❑ Responds appropriately and insightfully to the essay question ❑ Analysis question redefines the topic provided and constructs an appropriately focussed argument ❑ Argumentative response clearly and consistently articulated
Handling of 'primary' sources (ie story/book and film)	❑ Inadequately detailed or inaccurate representation of one source or the other ❑ Comparisons between sources not attempted, or not appropriate ❑ Radical imbalance in attention paid to either source (eg pays much more attention to the book than the film, or vice versa)	❑ Superficial response to / analysis of representation of both sources ❑ Comparisons between sources may be attempted, but not entirely appropriate or effective. ❑ May be some imbalance in attention paid to either source	❑ Adequately detailed response to / analysis of representation of both sources ❑ Profitable comparisons made between sources ❑ Balance achieved in attention paid to both sources	❑ Sensitive analysis of / comparison of both sources produces meaningful insights ❑ Each source evaluated on its own merits.

Adequate research basis *Appropriate research effort*	❑ Inadequate research basis ❑ Materials inappropriate or irrelevant to the topic and/or the discipline ❑ Does not exhibit awareness of source credibility	❑ Research basis just adequate ❑ Relevance of some sources to the topic / discipline debatable ❑ May not exhibit awareness of indicators of source credibility or reliability	❑ Solid research basis ❑ Resources generally relevant to the topic and appropriate to the discipline ❑ Exhibits awareness of indicators of source credibility, but may not fully apply them	❑ Research basis strong to extensive ❑ Resources highly pertinent to the topic ❑ Resources reflect current / important critical debates within the discipline ❑ Exhibits acute awareness of issues of resource credibility and reliability
Synthesis and analysis of secondary sources	❑ Inappropriate handling / representation of sources cited	❑ Debatable (but not dishonest) representation of sources – may include inaccurate quotation ❑ Broadly based and superficial reporting on sources ❑ Quotation from sources not entirely appropriate ❑ May not articulate relevance of ideas from readings to argument	❑ Generally appropriate reference to / quotation from sources ❑ Generally accurate representation of sources, but some inadvertent misrepresentations or misinterpretations evident ❑ Attempts articulation of ideas from readings to argument	❑ Cogently identifies key ideas from readings ❑ Insightfully reflects sentiment/ideas of the original sources ❑ Appropriate and apposite quotation from sources ❑ Thorough articulation of relevance of the materials to the argument ❑ Synthesises and analyses ideas from critical reading to construct emergent knowledge (an innovative argument).

Organisation & presentation of materials	❑ Does not achieve appropriate essay format
	❑ Key elements missing eg
	  ❑ Introduction
	  ❑ Conclusion
	  ❑ Other:
		❑ Essay format attempted, but effective structure not achieved
		❑ Editing for relevance of content needs work
		❑ Overall argumentative structure needs work
		❑ Logical sequencing of ideas needs work
		❑ Argumentative paragraphing needs work
		❑ Integration of quotations needs work
			❑ Essay format generally successfully achieved, but requires refinement:
			❑ Articulation of relevance of content reasonably effective
			❑ Overall argumentative structure reasonably effective
			❑ Logical sequencing of ideas reasonably effective
			❑ Argumentative paragraphing reasonably effective
			❑ Integration of quotations reasonably successful
				❑ Highly effective essay construction
				❑ Effective articulation of relevance of content
				❑ Effective argumentative structure
				❑ Logical and coherent sequencing of ideas
				❑ Relationship of paragraphing and development of ideas effective
				❑ Successful integration of argumentative text and quotations

Communication skills	❑ Major presentation problems ❑ Major problems with spelling, grammar and academic conventions ❑ Skills in written communication need work urgently	❑ Adequate presentation ❑ Partially conforms to spelling, grammar conventions ❑ Inconsistencies / inappropriacies in style, formatting and tone. ❑ Skills in written communication need work	❑ Generally appropriate presentation ❑ Generally conforms to spelling, grammar conventions; minor errors ❑ Generally appropriate style and tone ❑ Solid skills in written communication	❑ Professional presentation ❑ Consistently accurate spelling and grammar ❑ Consistently appropriate style and tone ❑ Well -to highly-developed skills in written communication
Citation	❑ Referencing and/or acknowledgement of sources absent or seriously deficient	❑ Citation attempted, but elements missing ❑ Inaccurate formatting of citations leading to difficulty in interpretation ❑ Citation not in Discipline style	❑ Citation information generally complete and formatting generally in Discipline style, but some minor errors in applying conventions	❑ Full and correct citation using the Discipline style

Appendices

Appendix 1: RSD Shell Rubric

Appendix 2: Work Skills Development framework

Appendix 3: QUT Library Map of Learning Objects, September 2009

Appendix 4: Resources and links

Appendix 5: Factors enabling research skill development, and benefits of explicit research skill development in the curriculum

Appendix 1: RSD Shell Rubric

Assessment task title

RSD

Student Name: _____ Student ID: _____

Marker: _____

←   Level of Student Autonomy   →

↓ Facet of Inquiry	Level 1 *Students research at the level of a **closed enquiry** and require a **high degree of structure/guidance***	Level 2 *Students research at the level of a **closed enquiry** and require **some structure and guidance***	Level 3 *Students research **independently** at the level of a **closed inquiry***
A. Students **embark on inquiry** and so determine a need for knowledge/ understanding			
B. Students **find/generate** needed information/data using appropriate methodology			
C. Students **critically evaluate** information/data and the process to find/generate this information/data			
D. Students **organise** information collected or generated			
E. Students **synthesise, analyse and apply** new knowledge			
F. Students **communicate** knowledge and the process used to generate it with an awareness of ethical, social and cultural issues			

Appendix 2: Work Skill Development framework

Work Skill Development Framework

LEVEL OF STUDENT AUTONOMY

FACET OF INQUIRY	Level 1 Student requires a high degree of structure & guidance	Level 2 Student works with some degree of structure & guidance	Level 3 Student works independently within provided guidelines	Level 4 Student works in an innovative manner within provided guidelines	Level 5 Student works within self-determined guidelines appropriate to the context.
A. INITIATIVE Student **establishes** role and adapts	Student establishes role requirements, requiring a high degree of guidance to identify and to adapt to position	Student restates correctly role requirements, requiring some guidance to identify and to adapt to position	Student establishes role independently and adapts readily to this context	Student adapts appropriately and through consultation the role, and fulfills original and new requirements	Student determines future goals and projects and works towards these, while fulfilling original requirements
B. TECHNOLOGY Student applies technology to **find** and **generate** information / data	Student uses technology with high degree of guidance to find and generate information /data	Student uses technology with some degree of guidance to find generate information /data	Student uses technology independently to find and generate a range of information / data	Student shows a complete understanding in choice of media and technology to generate information /data	Student shows a high degree of sensitivity in the application of media and technology to generate information /data
C. LEARNING Student critically **evaluates** their role and objectives to establish life long learning skills	Student evaluates information to understand their role, using a simple allocated format	Student evaluates with some degree of guidance, the methodology / technology in use, to generate knowledge	Student critically evaluates the match between theoretical and practical applications to generate knowledge	Student critically evaluates the value of communication processes to generate knowledge	Student critically evaluates knowledge to generate lifelong learning skills
D. SELF MANAGEMENT Student learns to self manage by **organising** information	Student uses reflective practice to organise information and establish role, using a simple format	Student uses reflective practice to master methods and practices using existing structures	Student uses reflective practice to evaluate and monitor own performance with confidence	Student uses reflective practice to deliver clear projects and goals	Student uses reflective practice to articulates visions, goals and innovative strategies
E. PROBLEM SOLVING Student **synthesises** and **analyses** to achieve desired outcomes	Student applies a simple format to synthesise and understand existing knowledge	Student applies a structured format to synthesise and analyse existing data and knowledge	Student works independently to synthesises and analyse a range of resources to generate new knowledge	Student works collaboratively to synthesise, analyse and produce innovative and creative solutions	Student ready to use diverse knowledge to initiate change and extrapolate outcomes
F. INTERPERSONAL COMMUNICATION Student **understands** self and others through interpersonal communication & teamwork	Student requires highly structured guidelines to communicate knowledge	Student requires some degree of guidance to communicate and understand position in team work	Student demonstrates independence, confidence and assertiveness in communicating knowledge	Student communicates competently showing absolute understanding of workplace culture and professional ethics	Student negotiates and asserts their own values while respecting the contribution of others, in communicating knowledge

Appendix 3: QUT Library Map of Learning Objects, September 2009

	Year 1	Year 2	Year 3	Year 4
	TRANSITION IN Bridging to academic practice	**TRANSITION THROUGH**	**TRANSITION THROUGH**	**TRANSITION OUT** Bridging to professional practice
	formative	transformative	transformative	summative
	Intensive academic support	**Increasing student independence**	**Continued increasing student independence**	**Bridging to professional work**
	Students research at the level of a closed inquiry. Students require a high degree of structure and guidance in information skills.*	*Students research at the level of a closed inquiry*. They require some structure and guidance*	*Students research at the level of a closed inquiry*. They research independently and require minimum structure and guidance*	*Students research at the level of an open inquiry* within structured guidelines*
	Substantial scaffolding *Defined direction* *Structured learning support*	*Moderate scaffolding* *Qualified direction* *Targetted learning support*	*Minimum scaffolding* *Broad direction* *Targetted learning support*	*Minimum scaffolding* *Self-direction* *Broad learning support*
Students *determine their need* for information and decide on the nature of information needed	**PILOT: Module 1: Determine your information needs** http://pilot.library.qut.edu.au/module1/ **QUT cite | write: Analysing Essay Questions** http://www.citewrite.qut.edu.au/write/essayquestions.jsp	**QUT cite | write:** **Analysing Essay Questions** http://www.citewrite.qut.edu.au/write/essayquestions.jsp **Writing Literature Reviews** http://www.citewrite.qut.edu.au/write/litreviews.jsp	**QUT cite|write:** **Analysing Essay Questions** http://www.citewrite.qut.edu.au/write/essayquestions.jsp **Writing Literature Reviews** http://www.citewrite.qut.edu.au/write/litreviews.jsp	**PILOT: Keep up to date** http://pilot.library.qut.edu.au/module2/2_5/ **Journal Alerting services** http://www.library.qut.edu.au/services/research/alertingservices.jsp

* Inquiry may range from closed (lecturer specified) to open (student specified) (Hackling and Fairbrother, as cited in Willison & O'Regan).

Appendix 4: Resources and Links

Achieving Academic Writing: This short online presentation from the University of Adelaide focuses on writing and referencing skills. It discusses the relationship between undergraduate research, academic writing and plagiarism.

http://www.adelaide.edu.au/clpd/online/learningmodules/avoidingPlagiarism/player.html

Business Education Research Network: This network, established by three members of the RSD project team at Monash University, aims to establish a community of practice for academics teaching in Business and Economics who are interested in the scholarship of learning and teaching.

http://www.buseco.monash.edu.au/bern/

Council of Undergraduate research: The Council of Undergraduate Research is a US organisation devoted to supporting and promoting collaborative research and scholarship by undergraduate students and academics. It was founded in 1978 and has members from over 900 colleges and universities. Its website is at:

http://www.cur.org

Inquiry @ Queen's: This website from Queen's University in Canada ails to help undergraduate students 'discover the satisfactions of well-conducted research'. It is linked to a conference and an e-journal.

http://www.iatq.ca/

Reinvention: a Journal of Undergraduate Research: this peer-reviewed e-journal from Oxford Brookes University and the University of Warwick in the UK is dedicated to publishing research by undergraduate students. It accepts papers from all disciplinary areas.

http://www2.warwick.ac.uk/fac/soc/sociology/research/cetl/ejournal

Research Skill Development for Curriculum Design and Assessment: This is the official RSD website, which contains downloadable copies of the RSD framework and this handbook, as well as information on the theory behind the RSD and examples of RSD-based rubrics.

http://www.adelaide.edu.au/clpd/rsd

Young Scholars in Writing: Undergraduate Research in Writing and Rhetoric: This refereed e-journal from Penn State Berks, a college of Pennsylvania State University in the US), is dedicated to publishing research articles written by undergraduate students, with a particular focus on disciplines related to rhetoric and writing.

http://www.bk.psu.edu/academics/degrees/26432.htm?cn21

Appendix 5: Factors enabling research skill development, and benefits of explicit research skill development in the curriculum

In 2008 and 2009 an ALTC-funded project trialled and evaluated the effectiveness of the RSD framework as a conceptual model for the explicit and coherent development of discipline-specific student research skills, from First Year to Masters by Coursework level. The study addressed two specific research questions:

1) What are the advantages and disadvantages of explicitly developing students' research skills?
2) What factors support student research skill development, and what factors hinder its development?

In late 2007, 14 academics, representing all Faculties across five Australian universities, used the RSD to inform discipline-, course- and assessment-specific marking rubrics for content-rich undergraduate or Masters by Coursework courses. These rubrics were used in assessments early and late in semester throughout 2008, to develop students' awareness of disciplinary cultures and standards of research, and help them to recognise that their studies were designed to develop and assess their research skills. While the project team members did not routinely change other elements of the curriculum at this point, students nevertheless experienced a change in the curriculum in comparison to previous years, due to changes in classroom dialogue about research and, especially, the assessment framing.

In 2009, another 12 academics and two librarians joined the project team, and 28 courses (three of which were at Masters level) applied RSD approaches in a similar fashion.

Four types of evaluation were used to answer the research questions cited above:

1) Students' self-assessment of research skills and attitudes to research, gained by using pre- and post- course questionnaires;
2) Academics' measures of student research skills, and their development during a course, utilising marking rubrics structured according to the RSoI of D;
3) Interviews with students, conducted one year after their completion of a course which explicitly developed their research skills; and
4) Interviews with academics using the RSD in a course.

First, pre- and post- course questionnaires were given to students in each RSD-based course. These showed statistically significant improvements in students' self-assessment of discipline-specific research skills, and specifically in: capacity to develop research questions; evaluation skills; and written or spoken communication skills. However, students' attitudes to research generally did not change.

 Second, project team members' measures of students' research skills using the RSD-based assessment tasks showed that these skills improved during the semester: when faced with end-of-semester tasks that demanded more autonomy, a higher degree of conceptual understanding and greater rigour, students' research skills improved compared to those demonstrated early in the semester.

Third, 46 students of differing ability were interviewed a year after completing RSD-based courses. Eighty-nine per cent (89%) of these stated that the research skills they had developed in content-rich courses were useful for employment; 75% said those skills were useful for subsequent study. Seventy-two per cent (72%) reported the ability to find

information and/or generate data as a benefit of the RSD approach, 52% the ability to critically evaluate sources and date, and the same percentage enhanced critical thinking skills.

Of 331 student comments about features that helped the development of their research skills, 44% were attributed to elements associated with RSD use, 38% were attributed to the course more generally, and 18% to factors outside the course. Of 224 student comments about featured that hindered development of their research skills, 40% were attributed to elements of RSD use, 25% to the course more generally, and 35% to factors outside of the course. Students therefore identified that, from their perspective, most of the factors that support their research skill development are within the control of teaching academics, and that a good proportion of hindering factors can also be controlled at the course level.

Finally, the study's External Evaluator interviewed 20 project team members and reported that they found the RSD assessment process more efficient than standard assessment, while providing more substantial guidance and feedback to students. The reviewer also found that some academics' perspectives on research in their own disciplines began to change as they engaged with the explicit development of their undergraduate students' research skills. During the timeframe of the study, nine new approaches to using the RSD framework were identified, with five of these coming from within the project team, and four coming from universities outside of the project team.

Comprehensive details are available online at www.adelaide.edu.au/clpd/rsd/study.