

Assessing real-world learning experiences validly and reliably

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Abstract—In Higher Education, there is currently a trend towards applying assessment to real world learning experiences. These types of assessment tasks often take the form of projects which are closely aligned with situations students might find themselves in when they graduate. Introducing new assessment tasks raises the issue of how do we assess students progress both reliably and validly. In this paper we discuss the issues of real world learning and in particular real world assessment tasks. We discover that a “one-size-fits-all” approach in terms of developing and assessing these tasks is not possible. As such, we propose a continuum on which real world assessment tasks can be found and present some case studies to verify that assessment of these tasks is heavily dependent on the task and discipline being studied. Finally, we conclude with some thoughts on other issues with creating and assessing real world tasks.

I. INTRODUCTION

Real world learning tasks are currently being promoted as a superior alternative to the more traditional type of assessment techniques. Indeed, Swinburne University has recently instituted the Curriculum Framework Project whereby it is a stated goal of the project to apply real world tasks throughout all faculties of the University. However, moving to a new assessment system requires careful planning and consideration as to how best apply these new techniques for ultimate success.

In this paper, the appropriateness of the use of real world learning tasks, in particular, with respect to their validity and reliability as tools for assessing students' progress will be considered. It is important that questions such as “Are real world assessment tasks suitable for all areas of study?” and “Is it possible to develop a generic, university-wide approach to real world assessment tasks?” be contemplated before undertaking any major change to assessment practices. It is also intended to explore the issues surrounding how the application of real world tasks will impact on teaching methods in the different disciplines. To this end, it will be suggested that the inclusion of real world tasks could be seen as working best in terms of a continuum, that is, tasks are a 'good-fit', and that they are implemented in individual discipline areas to ensure that they meet specific course requirements.

This paper is structured as follows. In Section 2 the concept of real world learning and real world assessment tasks is introduced. Section 3 considers the objectives of real world learning tasks, in particular, the benefits and limitations while Section 4 reflects on the difficulties envisaged in assessing real world learning tasks. In Section 5 a continuum for categorising real world learning tasks will be proposed along

with individual case studies to illustrate how useful tasks such as these would be to the different discipline areas.

II. WHAT IS REAL WORLD LEARNING?

Real world learning experiences are tasks that are established to give all students experience in the professional practice of their discipline. It is proposed that these experiences occur both in 'classroom' situations and in external situations. A real-world learning experience is a practical task (real or simulated) providing opportunity for practical application of theoretical knowledge. Real-world learning thus defined can encompass work experience placements/internships, fieldwork, study tours, research-based projects, case studies, performance projects, simulated role play and problem-based or apprenticeship-style learning.

Increasingly, Higher Education institutions are incorporating real world learning experiences into their curricula. Swinburne University, claims that “this combination of open-structured learning involving professional contexts, active learning and student reflection in a supportive environment is what distinguishes Real World Learning at Swinburne” (Swinburne 2007b).

III. OBJECTIVES OF REAL WORLD LEARNING

The objectives of real-world learning experiences are relatively straightforward. Their primary aim is to expose students to learning experiences that replicate or mirror situations that they would be expected to encounter upon entering the workforce after graduation. The result of these tasks is that students become accustomed to applying acquired skills to a problem, and that they gain practice in learning and understanding the process through which their chosen profession is practised.

It has been acknowledged for some time that “the institutionalising of professional education has resulted in fewer and fewer opportunities for young people to work their way up from artisan to professional status (e.g. as an engineer) by learning on the job” (Rowntree 1987, p.19). A key aim of real world learning tasks is to redress this lack of opportunity.

Real world learning tasks also seek to fulfill (Wiggins 1990, p.3) definition that “the best tests always teach students and teachers alike the kind of work that most matters; they are enabling and forward-looking, not just reflective of prior teaching.”

Assessment of the problem solving process on which real world learning is based, is difficult using traditional assessment

tasks and techniques. However, there has been considerable recent literature that has promoted assessment as something that is integrated with instruction, and not an activity that merely audits learning (Shepard 2000). Real world learning experiences prioritise students' learning opportunities and outcomes, and any assessment methodology for these tasks needs to create, and attempt to standardise, assessment criteria within this framework to be effective.

A. Benefits

In general the benefits of real-world learning experiences could be considered obvious. It is difficult to argue a case whereby teaching students through solving real problems - rather than theoretical ones - could not be beneficial to the students. In particular, the benefits to be gained include:

- Application of theory in a "controlled" environment
- Opportunities for observation and feedback over an extended application of skills
- Individualised learning - tasks can be tailored to individual students and groups
- Multiple assessors - teacher, supervisor, observers, peers, self, etc
- Developing skills, such as problem solving - which are generic to all forms of educational/career/life experiences

B. Limitations

The application of real world learning tasks also has its limitations, and they should not be considered the sole means of assessing students' learning and knowledge. These limitations are not as clear as the benefits, but are important considerations when designing these assessment tasks.

One potential problem is the parity/consistency of tasks between students. As students are given individualised or targeted tasks, the tasks will evolve such that they change from student-to-student or from year-to-year. The potential difficulty lies in trying to ensure that the objectives asked of the students have equal levels of complexity and require the same level of skill to successfully complete.

Another problem lies with the assessors, both in their objectivity and in the use of multiple assessors. Real-world tasks are often more complex, the bias brought by the assessors to the tasks could be related to their personal preferences towards what the tasks require. Also, due to their complexity, it is often essential to share the load of assessing real-world tasks. We then run into problems of managing consistency between the assessors.

In their context in the teaching curriculum as "preparation for life" (Rowntree 1987, p.28), assessment of real world learning experiences is problematic. Rowntree (1987, p.29) points out that "assessment in industry and the professions is generally informal, diffuse, ad hoc and continuous. It is based largely on the person's track record over a period of time and in fulfilling his duties rather than on what he can write about something at any given point in time. Nor is such assessment quantitative in any simple way". If real world learning experience is to replicate or simulate life

experiences in a truly meaningful way, assessment criteria and methodology need to be developed to model real world assessment. However, informal or ad hoc assessment cannot be considered reliable and has limited validity.

IV. ASSESSMENT

Assessment of real world learning tasks needs to be process-based, with the parameters of the task having clearly defined learning outcomes and assessment criteria. These may be imposed on an existing situation, for example, in work experience placements, or be provided as the guidelines in the creation of the task. Assessment criteria are identified to review and grade the process of how students arrive at the outcome rather than focused only on assessment of the final product itself.

Assessment of real world tasks is "authentic" as defined by (Wiggins 1990, pps 1-2) as "when we directly examine student performance on worthy intellectual tasks [which] require students to be effective performers with acquired knowledge ... and attend to whether the student can craft polished, justifiable answers, performances or products."

We would nevertheless, argue that assessment of real world learning tasks does need to consider a specified underlying professional subject knowledge base and the extent to which this informs the task itself places it on the continuum discussed below. According to Brown & Knight (1994, p.28), assessment should be concerned with the notion of "competence", that is, "principled reflection upon action...knowing how detailed expressions of standards should be". It is the detailing of these standards in creating process oriented assessment rubrics for real world learning tasks that makes them valid and reliable for both formative and summative assessment outcomes.

Assessment that is fair, leading to valid inferences with a minimum of error, is a series of measures that show student understanding through multiple methods. A complete picture of what students understand and can do is put together in pieces comprised by different approaches to assessment (McMillan 2000).

A. Methodology

In real world learning experiences it is even more crucial to define the purpose of assessment and what aspects of the task are to be assessed, than in traditional assessment tasks that are generally constructed entirely to facilitate assessment outcomes. Assessment may be summative and/or formative in its purpose.

Summative assessment is the use of assessment to measure the level of achievement that a student has reached at a given point in time, such as the end of a particular module or year, or the end of a university course. The term comes from the Latin word *summa*, meaning 'a summing up'. The purpose of summative assessment is generally to predict future performance, to license someone as competent, or as information for entrance to other academic institutions or for the selection boards of firms or professional bodies.

Formative assessment, on the other hand, as the name suggests, is intended to 'form' - to help students develop. It

usually does this by providing constructive and meaningful feedback from which they can learn to identify the ways in which they need to improve.

While real world learning tasks may contribute to the summative assessment of a students' coursework, they are themselves best suited to formative assessment methods.

Formative assessment is criterion-referenced. "Criterion referencing focuses assessment and allows for full descriptions of what a person has achieved, since it constitutes an agenda for discussion." (Brown & Knight 1994, p.9).

Brualdi (1998) notes the "having clearly defined criteria makes it easier ... to remain objective during the assessment ... [but that] performance-based assessments don't have clear-cut right or wrong answers. Rather, there are degrees to which a person is successful or unsuccessful." Assessment rubrics for real world learning tasks therefore need to be constructed to reflect levels, or degrees, of competence and assessors need clear guidelines regarding levels of proficiency. Given the potential variety of actual real world learning tasks to which assessment may need to be applied, criteria should also have the ability to be relevant in different circumstances.

There is a need to design different kinds of assessment tasks which will be significant learning experiences in themselves and which will provide the kind of feedback that leads to success for the individual and reinforces positive attitudes toward learning. (Nightingale, Wiata, Toohey, Ryan, Hughes & Magin 1996, p.7). Real world learning tasks support this idea and can be ideally suited to both ipsative and self-assessment methods.

Ipsative assessment, according to Brown & Knight (1994, p.9) means that the scale of worth, the benchmark against which current performance is measured, is oneself: present performance is compared to past performance. Self assessment, defined by Rowntree (1987, p.31) "gives the student opportunities to develop criteria for assessing himself and encourages him to take decisions based on his assessments, [and] it will be preparing him for a life in which he expects to have some control over his own destiny." For ipsative and/or self assessment criteria to be meaningful, they need not only to be clearly identified but also to be regarded as relevant and achievable by teachers, mentors and students.

For all concerned, assessment must be valid, reliable, practical and cost-effective, fair and useful. It is clear that assessment of real world tasks can be useful and fair. Their practicality and cost-effectiveness may be more difficult to achieve as the detailing of and marking against criteria and assessment rubrics can be complex. It is, however, its validity and reliability with which this paper is most concerned.

B. Validity

When we consider validity in the sense of assessment, we are considering whether or not the result of the assessment task actually achieves the purpose of setting the task. In discussing criterion referenced assessment, Brown & Knight (1994, p.9) note that "validity is at a premium, since assessment should

be geared to showing whether a student can fulfill a criterion which the curriculum has been designed to enhance".

It may sometimes be difficult to design traditional assessment tasks that are valid as these tasks aim to assess that the students have learnt the underlying material and are not just remembering points of a past presentation. However, this is rarely a problem when creating a real world assessment task. These tasks, by definition, require students to approach a problem and apply a set of skills to solving that problem - thus requiring students to learn the underlying material as repetition of facts or process will not help solve the problem. Assessment criteria reference the process and if task appropriate in their construction, ensure the validity of the test.

Typically the difficulty (for the assessor) in developing a real world task with high validity lies in ensuring that it is complex enough in that it actually challenges the students to think about the material being learnt. However, as there are lots of real world problems that students need to be able to solve, the assessor generally will have a large pool of potential problems from which to draw.

Often the difficulty of assessment lies in not the validity of real world learning tasks but in their reliability.

C. Reliability

Reliability refers to consistency of measurement - the extent to which a particular question or examination will produce consistent results under different but comparable conditions. There are at least three aspects of reliability - assessor reliability, test reliability and test/retest reliability (Wong 2007).

Any concerns about assessment of real world tasks, are primarily centred on its reliability. "For an assessment to be reliable it should yield the same results if it is repeated, or different markers should make the same judgments about students' achievements. Because integrated assessment involves a complex task with many variables, the judgment of the overall quality of the performance is more likely to be open to interpretation than an assessment of a simpler task." (Nightingale et al. 1996, p.19)

Real world learning tasks "provide comparable work-based and field experience across a cohort of students." (Wong 2007) and are therefore individualised assignments. The reliability of criteria that are tailored for individual assessment is low (although their validity may be high), particularly if the criteria, as Rowntree (1987, p.31) suggests they should, "allow the person being assessed responsibility for the outcomes of his own judgments and decisions."

Standardised assessment criteria, detailed assessment rubrics and well-constructed marking schemes that identify expected standards of proficiency, all contribute to increasing the reliability of assessment of real world learning experiences. Considerations of cost effectiveness and practicality may have an impact on the depth and extent of their implementation. Availability and appropriateness of tasks from student-to-student and year-to-year may also vary widely. Reliability will inevitably fluctuate in these circumstances.

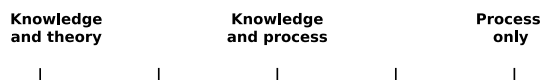


Fig. 1. The Task Continuum

Assessment of real world learning experiences illustrates “some of the tensions” (Brown & Knight 1994, p.21) “which can arise between reliability and validity - formative function means students should be encouraged to treat assessment as learning opportunities ... summative assessment with reliability to the fore means a tendency for tutors to limit range, length and form of responses and student to play it safe.”

V. CONTINUUM OF REAL WORLD ASSESSMENT TASKS

We propose that real world assessment tasks must vary depending not only on the individual task being assessed, but also strongly correlated to the field of study. In this section we propose a continuum upon which different real world assessment tasks might be located, a continuum where the assessment criteria applied to each task vary.

A. Defining the Continuum

The Continuum is based on the primary objectives of assessment, on which depend not only the assessment methodology but also the nature of the assessable task. The Continuum is constructed as a linear scale from assessment of purely theory and knowledge, through assessment of knowledge and process, to process only assessment.

In general, it might be argued that tasks at the purely theory end of the continuum are likely to be least suitable for real world learning experiences; tasks that combine knowledge and process may be best suited to simulated or constructed real world tasks (including fieldwork and research) which mimic future career tasks; and tasks that are process only orientated are required for industry based learning such as work experience placements and performance projects.

Although they substantially lengthen this paper, the following case studies illustrate the scope of this continuum.

B. Case Studies

These case studies fit at various points along the continuum shown above (Figure 1) and exemplify the need for real world assessment tasks to be specifically tailored to suit the needs of a particular field of study.

1) *Case Study 1: Psychology:* The formal discipline of psychology involves the systematic examination of many aspects of human behaviour and experience. This occurs through the integration of theory and research from the many sub-fields of psychology, such as, developmental, social, cognitive, personality and abnormal psychology. As such, psychology takes a theoretical approach to the understanding of both normal and pathological human functioning.

A specific sub-field of psychology is the psychology of personality. The focus of this unit is on the behaviour and experience of the individual as a whole person. An assumption of the approach used in psychology is that while there are

many proposed theories of personality, they can generally be categorised into one of a number of broad perspectives of how persons function. These perspectives include evolutionary, psychoanalytic, learning, dispositional, biological, humanistic, cognitive theories and so on. These perspectives are themselves clusters of assumptions about people, acting as starting points from which theory, research and practice proceed.

Having completed the Psychology of Personality, students are expected to be able to do the following: Explain the main features of the major approaches to the area; be able to discuss basic elements of important traditional and contemporary theories within each perspective, and be able to compare and contrast major theories within and across four perspectives in terms of how they address selected issues.

To include real-world learning experiences into the study of psychology is seen as problematic. The first difficulty is that, as outlined previously, psychology is taught on the basis of theory and includes a critical examination of empirical research supporting those theories. It is important to understand that accreditation requirements for teaching psychology at Swinburne are set by the Australian Psychological Society (APS). The APS is the governing professional body for the teaching of psychology for professional recognition. In order to become a registered psychologist, students must first complete an undergraduate degree with a major in psychology that has been accredited with the APS.

Part of the criteria for student learning outcomes is that they are able to demonstrate a number of skills that will enable them to conduct their own research but this does not actually occur until postgraduate level. Therefore, the second issue with incorporating real-world learning experiences into psychology is that undergraduate psychology does not involve actual contact with the individuals who are the focus of student’s studies. Indeed, undergraduate psychology could be said to take an “arm’s length approach” to understanding human behaviour. This is done to protect both students and the public from potentially harmful interactions. It is not until postgraduate level that the teaching of psychology incorporates real-world experiences, that is, students are required to complete placements in counselling or clinical settings and conducting ‘real’ research.

The inclusion of a ‘real-world’ project-based undergraduate subject will occur at Swinburne in 2009. Students will be required to complete a unit in which they undertake a collaborative project-based task under the supervision of a staff member. Design, implementation and completion are components of the task that will be assessed (no criteria have been set for this as yet) as part of Project Management. It is also proposed to assess a final report of the project. As suggested earlier, given the constraints of teaching an accredited undergraduate course in psychology, one wonders just how much of a ‘real-world experience’ a project-based subject can provide.

Aspects of this case study drawn from (Dickson 2007).

2) *Case Study 2: Engineering:* At first glance, Engineering would appear to be a discipline that is ideally suited to real-

world assessment tasks. After all, the primary aim of Engineering is to produce students that can creatively apply knowledge to an existing problem to design a solution. Ideally students are not taught to solve particular problems but instead techniques that can be applied to solve any Engineering problem. This implies that a real-world based approach - where students are assigned a problem and asked to devise a solution - would be an ideal technique to observe how well students have learnt to become Engineers and to how they apply those skills.

However a problem exists in that Engineering is not only about the process, the end result is extremely important. While it is important that students are able to apply their problem-solving techniques correctly, it is doubly important that their proposed solution is both viable and practical to implement. Once students graduate, their prospective employers are not going to be interested in the techniques they use to solve a problem but rather that the problem gets solved - or a working product gets built at an economic price.

As such, we need to be very aware that we properly assess not only the students approaches to solving the problem and whether or not they know where to access any resources that may be required, but we also need to assess the success of the student in actually solving the problem at hand. Engineering often falls into the middle of our proposed continuum for real-world assessment tasks - both the demonstrated knowledge of process and the practical output are important.

Let us consider an example where Telecommunications Engineers are asked to build a Web and Email server as would be found in any Internet Service Provider (ISP) (But 2007). This task provides a very practical real-world problem, one that is solved by Engineers within ISPs all the time. In this case we assess the process of the real-world task by examining how students approach the problem, do they:

- Know where to find information about setting up Web and Email servers
- Undertake a comparison of available techniques to select an appropriate implementation approach
- Understand that they will need to explore beyond the basic task to consider whether this has further ramifications on other applications
- Properly document their design decisions and implementations

We contrast this by also having to assess their final implementation:

- Does their Web and Email server implementation work
- Is the implementation cost effective (time, required operational expertise, monetary)
- Is their implementation robust and scalable

The validity of these types of assessment tasks is beyond doubt, students can be asked to develop systems that solve problems that are faced by Engineers daily. The reliability of the assessment however relies tremendously on the assessment criteria. It is imperative that great care be taken to ensure that all aspects of the task are assessed, both the approach taken by the students and the final output. It can be difficult

to draw up reliable assessment criteria to assess the students approach, particularly if the project is to be remarked by others - how do you assess the students capability to research available approaches reliably? These problems can often be exacerbated by larger projects that try to capture a problem more likely to be faced in the real-world, this inevitably leads to greater concerns about being able to reliably assess these projects within a suitable timeframe.

3) *Case Study 3: Business Studies for Circus Artists:* In performing arts education learning tasks are commonly simulated, if not actual, "real world" experiences. Students predominantly receive practical tuition in skill development with the underpinning knowledge practised rather than theorised. In most instances, this kind of learning attracts students for whom it is most suited and this is particularly evident in the specialised discipline of circus and physical theatre performance.

Many students are unwilling or unable to successfully engage in theoretical learning and have responded most successfully in Business Studies to teaching that is directly integrated with their performance practice. Rather than acquiring an in depth understanding of business management practice for its own sake, performing artists need to be entrepreneurial to survive in an industry that offers fluctuating and varied employment opportunities and individual artists need to develop their ability to articulate and manage their own work.

Assessable tasks in Business Studies for Circus are based on individual projects to which business practices are applied. Assessment of these tasks is process orientated and therefore primarily formative - criterion-referenced. Ipsative assessment is factored into assignments with negotiated self-assessment criteria agreed between students, teachers and project mentors. Provided criteria are clearly identified and actionable, the validity of these assessments is high.

Curriculum requirements for the subject, however, stipulate formal assessment tasks with graded outcomes. This necessitates the reliability of summative assessment. Reliability in these assignments is measurable against key criteria which are simplified and able to be measured objectively.

Assessment of these tasks is multi-purpose and requires results to be provided as both extended feedback and grading.

In third year, students are required to create business support material for their final Showcase performance act (Rickards 2007). This work has been constructed as an assessable task, while remaining a relevant "real world learning experience", by structuring the formal, required open book examination as a Grant Application. The task aims:

- To provide a checklist that all aspects of their performance project and its potential outcomes have been considered
- To formalise and be able to communicate their performance project appropriately to meet the guidelines required by existing and potential stakeholders in the work
- To provide evidence of a thorough and workable timeline for creation of the project including management and

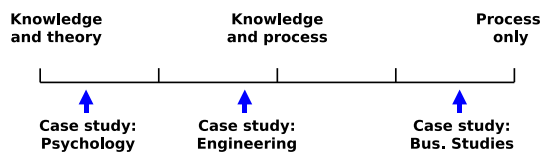


Fig. 2. The Task Continuum Showing Case Studies

operational process of key areas - creative, production, marketing and administration

- To provide evidence of a detailed cost analysis for the creation of the project
- To present a budget for the project that can be signed off so that individual showcase funds can be released to implement the project
- To identify legal, financial and intellectual property rights and obligations regarding the final project

This format not only replicates a real world task that offers students experience and feedback that will be directly relevant in their future work practice, but one that's real world application is subject to summative criterion-based assessment that can be appropriately be applied to institutional grading requirements. Within the Business Studies framework, assessment of this material is not judgmental of the artistic worth of the ideas presented. Criteria apply to the breadth and depth of the detail included to explain and support the project.

VI. CONCLUSIONS

In preparing this paper, the potential for real world learning experience to complement, extend and enhance student learning has been shown to be widely supported by assessment theory. It has been gratifying to realise that it is not merely an instinctive teaching framework widely used by teachers with substantial experience in their professional discipline but little training in educational theory.

Case studies presented from our own teaching practice have illustrated the theory, and their strengths and weaknesses highlight its conclusions.

The paper aims to open discussion on the subject and proposes a continuum that can be further developed and tested when considering real world learning experience as an assessable task.

VII. WHERE TO FROM HERE?

The paper's preparation has raised a number of questions that might be considered further:

- Given the relative appropriateness of formative vs summative assessment in real world learning tasks, are they better confined to hurdle requirements of a curriculum rather than graded tasks?
- Students' relationship with the tasks - their contribution to the creation of assessment criteria; opportunities and criteria for self-assessment - high validity but how can they be reliable, practical and cost effective to devise

- Would a better illustrative model for real world learning be better presented as a graph rather than as a continuum - adding a y-axis for assessment methodology (formative to summative)
- No doubt there are others

It is a timely issue to consider as Higher Education embraces and seeks to assess real world learning.

From 2007, at Swinburne University, for instance, all students are set a major project task in their final year of study. The tasks can be discipline specific, multi-disciplinary and/or inter-Faculty. While there is an emphasis on the work being collaborative it is possible for students to work individually on a project task. Projects are designed as open-structured, real world focused activities which will present authentic professional challenges in which students are expected to apply and acquire a broad range of knowledge and skills. The intended outcome is that students will identify their personal strengths, develop project management and team work skills, along with personal skills and apply their learning to real-world situations (Swinburne 2007a). Well-considered assessment methodology will be crucial.

In any circumstance, we consider that: "Not only should assessment practice be student-centred, and based on outcomes, but the teaching program should be directed at achieving the desired outcomes of student learning" (Nightingale et al. 1996, p.10).

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