An investigation into unit design for developing undergraduate independent learning abilities

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Many universities aspire to produce graduates who are independent learners. This paper describes explorations into what independent learning means and how it can be developed in practice within the typical resources of a standard undergraduate unit. The paper proposes techniques for advancing students along the path to independent learning and describes how these techniques have been applied in practice, including pragmatic observations on the techniques. Given the absence of clear methods for assessing independent learning, qualitative focus groups were conducted based around questions related to student perceptions of their learning and experience. These perceptions are being explored in an ongoing research investigation into a hybrid content-based/project-based final year undergraduate unit, designed to improve the development of students’ independent learning. Some initial evaluation outcomes are presented and discussed, along with lessons learned in relation to conducting the focus groups. One interesting finding is that students were positive about their learning experience despite the unfamiliar class structure and their recognition of challenging material and strict marking. We conclude by describing how we are approaching our on-going investigation along with some possibilities for future research.

Keywords: independent learning, critical thinking, group project work

1. Introduction

One goal of undergraduate education is that graduates be able to learn independently (Gow & Kember, 1990; Baird, 1988). The ability to learn independently is open to various interpretations; however, they typically include concepts of critical and independent thought as well as autonomy (Ramsden, 1992; Moore, 1973; Eneau, 2008; Bradley, Noonan, Nugent, & Scales, 2008). We take the view that successful higher-degree-by-research (HDR) students demonstrate independent learning. Therefore, the expectations of postgraduates by universities can be used as a guide to what is meant by independent learning in general. Postgraduate research students demonstrate independent learning by completing a largely self-directed research project in which they must define both the scope and path of their research. We believe postgraduate research is independent learning because of the following properties: 1) it is individual – no two researchers take the same path, and therefore such research projects are not amenable to mass-instruction approaches; and 2) the novel nature of
their task ensures that the assistance received is via mentoring which provides only partial
guidance (high level) and partial feedback. This is in contrast to standard content-based tasks
in which it can be ensured that feedback is sufficient for all moderately able students to
successfully meet requirements. The creative and novel elements of research combined with
only limited feedback forces students to rely on their own resourcefulness and develop their
own strategies for success. We believe that it is these abilities that educators seek in
independent learners, and that allow the highest levels of academic achievement as well as
value to industry.

The next section of our paper examines traditional and recent approaches to undergraduate
teaching, from which we argue for a selected set of techniques appropriate for developing
independent learning consistent both with the properties we have identified and within the
resource limitations of undergraduate units. In Section 3 we describe a unit in which we apply
these techniques. This unit involves both project-based work and the learning of new content,
so techniques appropriate to both modes of learning are utilised. Section 4 describes our
chosen evaluation methods followed by a discussion of initial outcomes of the research and
methodological lessons learned on the way. Finally, in Section 5, we summarise the findings
of our analysis along with a discussion of our future areas of inquiry.

2. Teaching methods and techniques

Traditional teaching in higher education typically involves breaking contact hours into
lectures and tutorials. The lecture is where the “delivery” of the material takes place, with a
knowledgeable teacher presenting material to a comparatively large group. The tutorial (or
laboratory session) involves teaching smaller groups of students in facilitated-learning
activities. This format is relatively uniform in higher education in Australia (Phillips, 2005),
the UK (Gibbs, 1992) and the US.

Phillips (2005) contends that lecturing tacitly adopts an objectivist epistemology, “assuming
that the learner is an empty vessel to be filled with content” (p. 3). He draws on prior work,
such as Laurillard (2002), to argue that a significant limitation of lecturing is that it requires
the entire class to have shared capabilities and background knowledge. An additional problem
is that lecturing creates a power imbalance where “the teacher’s responsibility is to ‘teach’,
which implies determining the content, and controlling the sequence” (Phillips, 2005, p. 6).

A number of other educational problems have been linked to the lecture-based model. For
example, Massingham and Herrington (2008) attribute decreasing student attendance at both
lectures and tutorials to the following aspects of the lecture-based model:

- students will attend lectures only if they perceive value in them;
- the traditional role of the lecturer in analysing and synthesising material, thus making
  it simpler for students, is based on outdated pedagogy. A contemporary approach
  would require students to analyse, synthesise and explain rather than have the lecturer
  do it for them;
- students may be “instrumentally motivated”, that is, they may only be interested in
  doing what is required to successfully complete assessment work rather than engage in
  deep learning; and
- instrumentally-motivated students may not take sufficient personal responsibility for
  their own learning. Instrumental motivation may develop in students who have
  experienced a level of success in academic environments that do not support deep
  understanding and a thirst for knowledge.
Bligh (2000) acknowledges that lectures are primarily useful for transmitting information, but are not very effective in promoting thought, changing attitudes or developing behavioural skills. Creative and innovative alternative approaches to the delivery model of lectures have been successfully used to overcome these limitations, such as interactive lectures (Meltzer & Manivannan, 2002). Despite these alternatives, traditional delivery-model lectures are still deeply integrated into educational institutions, from teaching assumptions through to work-load allocations and administrative policies (Phillips, 2005).

Laurillard (2002) argues that universities should focus more on the generic skills of scholarship, and argues that, as researchers, most academics are consummate reflective practitioners; however, as teachers, they focus on transmitting knowledge to students. We believe that by providing students with training that is more like the training academics received themselves when learning to be reflective researchers, students’ own abilities will be improved. We will look first at what we are trying to achieve before suggesting possible methods.

2.1 Independent learning
The concept of ‘independent learning’ and ‘independent study’ has been interpreted in various ways. Moore (1973) recognised multiple uses of the term which includes correspondence and distance studies as well as out-of-school part-time degree programs for adults. According to Moore (1973), the crucial ingredient is learning autonomy which is defined as “the will and ability to exercise powers of learning, to overcome obstacles for oneself, to try to do difficult learning tasks, and to resist coercion” (p. 667). Eneau (2008) discusses the role of interdependent relationships on developing autonomy, in particular the social aspects of learning, such as collaborative learning. The term ‘independent learning’ may also be used without an exact definition; for instance, Geraghty and Quinn (2009) do not explicitly state what they mean by independent learning, but refer to individual learning, which takes place outside the classroom. Ramsden (1992, p. 88) recognises “a commitment to encouraging student independence” as one of the important properties of good teaching. Dimensions of independence include student “[p]erceptions of choice over how to learn the subject matter, and of control over which aspects may be focussed on” (Ramsden 1992, p. 100). It is also related to providing students the opportunity “to practice the art of inquiry” (Ramsden 1992, p. 101). We argue that independent learning embodies all these dimensions and is typified by the kind of learning undertaken by higher-degree-by-research (HDR) students, that is, postgraduate, research-based learning. In this context, students remain largely autonomous and exercise significant control and responsibility over what to learn and what sequence to learn. They also engage in learning through academic enquiry, which necessitates critical thought and reflection in the sense of becoming “critically aware of the suppositions of one's thought” (Schumacher, 1977, p. 54) and “regarding the assumptions beliefs and values … assimilated during childhood and adolescence” (Brookfield, 2000, p. 94). Bligh (2000) suggests that lecture modes are better suited to content-delivery than to development of generic skills such as critical thinking. However, tutorials may reverse this bias, if they are small enough; for example, Cannon and Newble (2000) state that methods for active learning in small groups can be adapted for tutorial settings.

Laurillard (1993, p. 2) characterises the vision of academic learning as a community of scholars where students take responsibility for their own learning as “attractive”. She recognises that such a vision is realised for postgraduate (that is, HDR) students, but is difficult for undergraduate teaching. The reasons for the difficulty are, firstly, the costs involved in the labour-intensive nature of assessment and guidance in this context; and,
secondly, the nature of the undergraduate curriculum which is often concerned with transmitting a body of knowledge to students (Laurillard, 1993). Ramsden (1992, p. 100) recognises the desirability of student independence is “rather bad news” for traditional lectures, tutorials and orthodox approaches to the curriculum. Laurillard (1993, p. 137) argues that university teaching needs to be more oriented towards “long-term high-level cognitive skills”. We argue the ability to learn independently is such a skill. We also believe that we can use the postgraduate learning model for inspiration in developing methods to encourage independent learning in undergraduate teaching.

2.2 Supporting independent learning
While we have sought to avoid a definition of independent learning, based on the literature presented above, we believe that facilitating independent learning incorporates the following elements:

1. Autonomy, that is, control over both content and process. This may be achieved by empowering students through giving them increased control over the conversation about their learning and its execution, including:
   a. What topics?
   b. What sequence?
   c. What aspects of topics are important?
2. Self management skills, especially time management skills.
3. Frequent, customised feedback on student work, allowing changes prior to final assessment.
4. A creative element allowing individualised engagement with, and use of, the material being learned.
5. Social learning, not just individual – students should have opportunities to discuss their ideas and be exposed to different opinions.
6. Critical thinking, including being aware of the underlying suppositions of one’s thoughts and beliefs.

As suggested by the literature, the traditional lecture and tutorial model, while able to provide some of these objectives, is probably not sufficient for all the above without modification. The traditional approach towards supervision of HDR students is probably more appropriate; however, applying this approach to large numbers of undergraduate students is restricted by resource limitations (Laurillard, 1993). We have examined how we could adapt existing undergraduate methods to allow us to provide, within the staff, room and time resource limitations for undergraduate classes, these six elements as best we can. The unit of study for which we applied our adapted techniques is an e-commerce unit which was originally largely content-based with some assessment based on a small group project component. The unit was redesigned to effectively reverse the significance of these two components, so that it did include some new content, but assessment was primarily based around a group project. The predominant classroom activity is teamwork in the project groups, and is consistent with the work of others moving towards team-based approaches, such as Fink (2002) and Michaelson (2002). The detailed structure and assessment of our unit are described below.

3. Unit design to encourage independent learning
To best support our students to develop the skills outlined above, major changes were made to the structure of the available class time, and to the design of assessment tasks and the feedback processes around these tasks.
3.1 Class structure
Faculty policy required that the unit must have the standard student-to-staff-ratio for tutorials and the same total face-to-face teaching hours as other equivalent units offered in the university. For our university, this meant a weekly one-hour lecture (for the entire cohort) supplemented by a two-hour tutorial (in groups of up to 25 students). Student-to-staff ratios were thus up to 25-to-1 in the tutorials, and much higher in lectures depending on the enrolment for that semester (for this unit, typically from 30 to 60).

We addressed these constraints by replacing the separate weekly lecture and tutorials with a single three-hour session, in which all students are in one large room for the entire three-hour period. The class time was then reorganised as:

1. mini-lecture to full cohort (30 minutes) – a single staff member present;
2. group work (two hours) – students in small groups (typically five per group), with several tutors present, depending on class enrolment; and
3. second mini-lecture to full cohort (30 minutes) – a single staff member again.

During the group work session, tutors met separately with their student groups for at least 20 minutes. Each tutor was responsible for up to six groups, and could therefore be responsible for up to 30 students (depending on the semester enrolment).

The full group (mini-lecture) sessions are intended to support the development of independent learning by:

1. modelling both planning and self management skills; and
2. modelling critical thinking skills.

Each week in these sessions the lecturer reviews the requirements of various assessment items, question students on their organisation and planning to meet deadlines, and describe techniques for these steps, as well providing sample plans and discussing possible impediments. It may be argued that modelling thinking processes and providing guided planning and self-management within a structured unit is inconsistent with the development of autonomy in students. However, Willison, Pierce and Ricci (2008, p. 489) found “that some of the skills required in complex open-ended field-research environments were developed through guided and well-structured literature research tasks”. Consistent with our belief that students need a staged introduction to higher-level skills, a scaffolding approach is applied to developing critical thinking. A major proportion of the full-group sessions remain dedicated to content delivery, such as academic challenges regarding the benefits of technology, and to attempt to model critical assessment of these topics, challenging student beliefs and encouraging critical questioning by students.

3.2 Feedback and assessment
The second aspect of the unit’s redesign was to incorporate assessment and feedback strategies, taking advantage of the new class structure to further encourage independent learning. A major objective was to provide continuous feedback in group meetings, including not only questions to direct student efforts and understanding, but again also a significant component of modelling. The difficult skills of independent learning and critical thinking are not developed easily and we aim to provide as much support as possible. We also believe that these skills are developed over time and it is important to be realistic about what can be achieved in a single final-year unit. The group sessions are focussed on giving continuous and targeted feedback prior to the final submission of group projects.
Creativity and personal ownership were identified above as important elements for independent learning. To provide this element, the major group assessment task is to create an innovative new business idea or adaptation to an existing idea. Content presented in lectures is not directly assessed (there are no tests or exams); however, aspects of the content are relevant to particular group projects. Given the concern that some groups may not operate as well as others (Fowler, Gudmundsson & Whicker, 2006), a substantial proportion of marks are allocated to individual reflections on the group process (specific questions are provided to guide students in relation to this). This allows individuals in underperforming groups to compensate by providing insightful reflection on their group’s processes.

For their second major assessment piece, students submit an individual essay on their choice of an issue of interest related to their course of study. Allowing student choice here is intended to allow them the desired element of autonomy. However, substantial marks are again allocated to a reflection on their paper, which in this case is intended to encourage critical thinking in relation to the topic they write about.

4. The research evaluation

During the pilot phases of implementation, a small evaluation project was undertaken. The first phase of the evaluation, reported in this paper, aimed to assess student perceptions and acceptance of the redesigned unit, including its structure and assessment. We focus on student perceptions of the unit because reliably measuring improvements in independent learning is largely still an open question. In at least one study, the attempt to detect improvements related to independent learning failed (Gardner, 2007). However, this does not necessarily mean that no improvement was made. At this stage it was considered more important to assess student reactions to our unit design. Based on our arguments above, we assume, for now, that the elements of this unit design are appropriate, in varying degrees, for developing independent learning. Measuring improvements in independent learning is an objective we hope to explore with future cohorts.

Our student cohort consists of predominantly Chinese students, who come to Australia to complete either the last 10 or 16 units of their degree. Their university studies in China follow a teacher-centred model (similar to our formal lectures) and are typically assessed by final examination. However, some have experienced tutorials where they receive practical experience with e-commerce tools. The aim of our study is to determine how the unfamiliar structure of our unit might affect their perception of the unit overall and of their learning experience. In other words, we are investigating their reaction to this unit’s particular combination of teaching methods and techniques.

4.1 Research methodology

Small focus group interviews were conducted with student volunteers. A set of questions were developed as a basis for semi-structured discussion. Group interviews allow a balance between requiring answers to posed questions and allowing discussion to range freely (Saunders, Lewis & Thornhill, 2009). This method was seen as appropriate because it was not clear initially what issues may be of interest in relation to this unit’s design and delivery. It is a method which allows for elaboration beyond simple answers and also allows moving beyond the researchers’ perceptions to better understand the participants’ point of view (Esterberg 2001; May 2001).
One topic of interest was whether student perceptions would change over the semester. We believed that students might experience considerable discomfort early on in the semester, but that this discomfort may reduce as semester progressed and they become more familiar with the unit’s format. We therefore conducted two sets of group interviews, one in the first two weeks of semester, and another in the second last week of classes. Small gift vouchers (AUD$20) were offered to students who participated in these sessions, and sessions were conducted immediately following classes. Students who were not comfortable with group discussion were invited to have an individual interview and this was an option that was adopted by some students. All interviews were conducted by an independent staff member, not involved in the teaching and assessment of the unit, and ethics approval was gained prior to undertaking the project.

Interview questions were based on the major elements of our unit’s design, specifically:

1. students’ perceptions on the feedback received (which was the purpose of weekly group meetings);

2. students’ perceptions of the group-work; and

3. students’ perceptions of the overall unit design.

Student responses were recorded manually, as handwritten notes by the interviewer, to alleviate any possible concerns by students about electronic recording. Responses were recorded verbatim as much as possible, with the interviewer reading back notes to students, to ensure responses were captured accurately.

4.2 Evaluation results
The first iteration of focus group interviews were conducted during semester 2, 2009, with a cohort of 30 students. Six students participated in the first round of interviews, in week 2 of semester (four in a group interview, and two students in separate private interviews). Nine students participated in the second round of interviews in week 11, all in a single group. Major shortcomings of comparing the responses from the two rounds is that the overall number of participants is low, and different students volunteered for each round, with minimal overlap. However, despite these shortcomings some interesting areas of consensus did emerge:

1. students were surprisingly accepting of the mix of group and class work in week 2. The group of nine interviewed at the end of semester expressed unanimous approval;

2. a high level of satisfaction with peer interaction as part of the group-work expressed by all students in both round of interviews; and

3. a high level of satisfaction with the feedback and support from teaching staff, again expressed by all participants in all interview sessions.

Several respondents appreciated the time allocated within class for meeting and working with their group members. This was captured in comments such as: “I specially like the meeting times for groups not outside class” (in week 11). However, one group reported problems including non-attendance of members at class and a member not contributing. Students in both rounds of interviews seemed to appreciate the opportunity to collaborate with others. Students commented that “Others bring different perspectives”, and “We can brainstorm ideas”. Both the positive impressions of small group discussion and the problems of group assessment are consistent with the results of Li and Campbell (2008) although dedicating class time for meetings may avoid some problems of group work.
A number of positive comments were made about the feedback provided, including: “Yes, lots of individual support” (in week 11). There seemed to be general agreement on this with other responses such as “Definitely” and “Absolutely”. The overall positive response to questions regarding feedback is of particular interest in this research, as a major aspect of the unit design was to provide frequent and rich formative feedback to facilitate student development prior to summative assessment, and to clarify any implicit criteria (see MacLellan, 2001). It was hoped this would reduce the different expectations of students and teachers regarding assessment requirements. It was also hoped that high levels of continuous feedback would result in higher-quality final submissions of the group project work. The student responses suggest some success in at least the first of these objectives. This may be in part because the feedback was somewhat divorced from assessment, which Wood and Freney (2007) suggest is less threatening to students. One student did comment that the marking was strict suggesting that the positive feedback was not due to lenient marking which could otherwise be a factor (Davies et al., 2007).

4.3 Limitations and lessons
One limitation of the study was the small numbers of students who volunteered to participate in group interviews (20% participation for the first round, and 30% for the second round), from an already small cohort of only 30 students, with very few students participating in both rounds. This means that we cannot assume that an increased acceptance of the new teaching model in the second round interviews indicates any increased acceptance amongst the student cohort – it may be that only students who had a more positive experience in the unit volunteered for the later interviews.

Additionally, the use of group interviews, rather than individual interviews, may have influenced the responses from students. Esterberg (2001, p. 111) notes that such group interviews carry the risk that “participants might censor themselves and defer to group opinion so as not to ‘rock the boat’ or make others feel uneasy”. May (2001) raises concerns about generalising results from a single group to a wider population, given that the internal interactions of groups may result in people modifying their opinions. These two risks could be regarded as types of group-think.

However, we do believe that elements of our on-going study may address these group-think issues. This paper reports on the results from a single student cohort from a single semester. We are currently extending our study across two further student cohorts, which may address the concerns of May (2001). In relation to concerns in Esterberg (2001), we intend to ask the second cohort to discuss their answers in pairs and to individually write down their responses to the posed questions before engaging in group discussion. The written responses will be collected. This may allow us to identify whether individual responses are reflected in the open group discussion. This will also hopefully help address one difficulty of the study which was a general reluctance to voice opinions in the full group interview and discussion. Finally, May (2001, p. 126) suggests that group interviews can provide a different perspective from research conducted on individuals regarding the same issue. We also have ethics approval to analyse the student reflections on their work (one of the assessment items) for the purposes of this study, and these reflections may provide additional insights into the success of the unit’s design from individual students’ perceptions.
5. Conclusions

We have argued that the design of the unit described here is more appropriate for the development of independent learning than the standard lecture and tutorial format without requiring additional resources. However, we need to investigate how well this approach scales to larger cohorts. Our evaluation to date has focussed on student acceptance of this design and not on the effectiveness in developing independent learning which is still an open question. Student feedback was very positive regarding the design of the unit, particularly the level of feedback received and peer-interaction. However, the on-going study needs to eliminate group interactions as a factor in this consensus and to assess the consistency of this opinion across student cohorts and unit offerings.

References


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