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The role of textbooks and other teaching and learning resources in higher education in Australia: change and continuity in supporting learning

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Abstract

This paper investigates the role of textbooks and online learning resources in university study. In a large scale Australian research project the course coordinators and lecturing staff of twelve university courses were interviewed to elicit data on the resources that are prescribed to support student learning, the role of textbooks in teaching and learning; resource shifts between online and paper based resources; and the links between assessment and learning resources. The paper also reports on the student perspective of similar issues from students involved in sample of twelve undergraduate university courses.

The research presented here reveals that textbooks produced by commercial publishers were recommended in every university course. Furthermore the use of these textbooks reflects a typology of integration into the learning design of the course to support student learning. The research found that a resource shift to the sole recommendation of online resources was not occurring, and that the provision of these online and digital resources was complementary and designed to support traditional learning resources.

Regarding student use of learning resources, the research concluded that students indicated that they are time-poor and as a consequence, their capacity to engage fully with all learning resources recommended by course coordinators and tutors is limited. Although students did listen to the messages about learning resources conveyed by their tutors, their motivation was driven by the demands of their course

assessment and as a result, students prioritised their focus on specific resources. The resources at the top of the priority list related specifically to successful completion of assessment tasks.

Background to the study

The teaching and learning context of the contemporary university

Australian higher education, like university education world wide, is experiencing rapid change within its teaching and learning context, with many new pedagogical and technological initiatives transforming the landscape of teaching and assessment. Higher education is moving online, prioritising the capacity of universities to provide greater flexibility in study through the provision of enhanced online delivery and support for student learning. Accordingly, universities are investing heavily in widespread implementation of learning management systems (such as WEBCT, Blackboard, and Moodle) that allow students greater online digital access to relevant subject matter and course content.

This investment is occurring during a period of rising classes sizes, reduced face-to-face contact between staff and students, and a steady decline in staff/student ratios. Withers (2010), the chief executive of Universities Australia reports that these increased staff/student ratios are responsible for declines in Australian university international rankings, due to the fact that Australia has experienced almost 15 years of reduced real public funding per student. This echoes the findings of the Bradley (2008) review of higher education that identified a number of university challenges in providing students with stimulating and rewarding higher education experiences. Bradley identified findings included rising staff/student ratios, increased use of casual teaching staff, and decline in face-to-face teaching in favour of online presentation, as issues that could affect the learning outcomes of university students, due to their effect these issues have on the selection and use of the learning resources required to facilitate student learning.

In Australia, this digital higher education shift is also occurring within a context of the development of new accountability measures for both lecturing staff and university courses. Examples of such measurement and monitoring of universities include the Australia-wide use of the Course Education Questionnaire (CEQ) which gauges student satisfaction of the teaching/learning process, as the basis for the distribution of increasing teaching and learning funding by the national government. This is occurring at a time of increasing use of student evaluations to measure aspects of university teaching and student engagement.

As a formal means of judging university performance, the Australian Government has introduced a range of new accountability and standards institutions, such as the Australian Universities Quality Agency (AUQA) and the Tertiary Education Quality Standards Authority (TEQSA). These new institutions have further served to refocus the attention of universities on the quality of their teaching and learning, and in acknowledgment of these new accountability measures, universities have responded by revising teaching and learning policies and procedures, through the establishment of Centres for Teaching and Learning. These units have assumed responsibility for developing new teaching and learning strategies, providing relevant professional development for academics, and writing new research-based teaching and learning plans (Huntly & Donovan 2010).

Teaching and learning resources in Australian higher education

A range of learning resources is used to support contemporary students in their higher education studies. University learning management systems (LMS) provide course websites with learning resources, support materials, and networking and online communication technologies. These materials are also frequently linked to a wide range of online library resources and services. Tertiary education courses are also generally supported by university- developed and published course packs, comprising a knowledge-base of readings from a variety of commercial and non-commercial books and journals.

Additionally, most university courses are supported by commercially produced textbooks, many of which have been produced for specific courses, and can be prescribed as essential or recommended student resources. Increasingly, these textbooks incorporate advanced pedagogic design (Walker & Horsley, 2006), and contain pedagogic features to assist learning; online teaching, learning and support resources; and specific 'teaching support' packages for lecturers and tutors. In terms of the provision of learning resources, all Australian universities also include a campus bookshop dedicated to the supply of textbooks.

In fact, Australia has a well-established tertiary education publishing industry that provides textbooks, lecturer support materials, and other learning materials for Australian university students and the courses in which they are enrolled. These materials are often commissioned by local publishers, written by university academics and developed in conjunction with Australian tertiary publishers who annually produce hundreds of new titles, new editions and adaptations. High quality textbooks and integrated (often digital) learning materials can contribute substantially to the quality of student learning experiences and outcomes. In an attempt to supplement this support and hence enhance the teaching and learning experience of students, universities are also expanding the online support and resources available on course LMS sites. In light of the renewed public and Government scrutiny of university 'delivery', it is little wonder that there is renewed interest in teaching that most effectively facilitates student learning.

In order to research these elements of the contemporary university learning environment, there firstly needs to be an examination of previous research on the topic.

Literature Review

Very few Australian studies have explored the role of teaching and learning materials such as textbooks, as they relate to student learning in the context of higher education. Richardson (2004) in a seminal study, explored the role and function of textbooks, in learning within the discipline of economics. He concluded that student writing in economics is shaped by economics textbooks, which represent an authoritative disciplinary canon. Richardson's research methodology comprised an interpretative ethnography, with observation and interviews with students in a first year economics course, reporting that reading and writing in tertiary study is always located, described, interpreted and framed within a disciplinary context.

In another key study, Jones (2005) explored how traditional technologies in teaching and learning were being supplemented and replaced by newer information and communications technology (ICT) methodologies. Through a study of tertiary science textbooks, Jones concluded that the replacement of traditional technologies by ICT, created multiliteracy demands that were subject specific and created a need for a new 'meta-semiotic knowledge' related to specific subject literacies. Kress (2005) identified that the implications of new learning technologies for re-defining disciplinary literacies and pedagogy, have yet to be fully explored. Despite this recommendation however, current research on contemporary learning management systems largely seeks to identify the benefits of learning from the implementation of ICT platforms, ICT learning strategies, student outcomes and the nature of higher education teaching and learning innovations.

As part of his findings in relation to the uptake of online delivery, Bradley (2008) reported that face-to-face teaching was highly valued even though students enjoyed the flexibility offered by ICT-delivered courses or course content. Regarding engagement with teaching and learning resources, Bradley (2008) noted that university students responded best to a broad mix of learning tools and resources, and that over-reliance on ICT-mediated methods may disadvantage some groups, namely low socio-economic background and mature age students. In a development worthy of concern, the Bradley review also identified relatively low levels of student satisfaction in the general provision of teaching, support services and learning resources.

The questions posed by the research presented here arose from perceived gaps in the current literature relating to the selection and use of learning resources in the higher education environment. Given that there is a move to the provision of online learning resources, whilst maintaining a certain level of traditional teaching and learning resources, the research presented here sought to clarify whether advances in the use of e.learning technologies in university classes, facilitated changes in the selection and use of associated learning resources. Furthermore, this research sought to develop greater understanding of the disciplinary cultural practices of university students and teachers as they use and integrate a range of learning resources in their disciplinary study. It responds to Kress' (2005) recommendation to explore the results of multimodal and multiliteracy environments on the development of disciplinary literacy.

Framing the study

The teaching and learning resources that are provided in a University course of study are considered important learning tools that can be utilized to support student learning. Tools such as textbooks, course readers, tutorial guides, case problems and activities, blogs, links and Podcasts also contain structuring devices such as graphic organizers, guides, charts, templates, permits and other features that reflect a pedagogic design process created and utilised with the aim of facilitating student learning.

Three further features of these learning tools are critical to understanding the role of teaching and learning resources in University courses. Firstly, such learning tools reflect an academic disciplinary community of practice. Teaching and learning resources are chosen by professional experts at the core of academic disciplinary

practice, with the choice of these resources reflecting resources developed with this community. This choice in turn, reflects the shared teaching and learning resources within the academic community (Wenger 1999).

Secondly, the teaching and learning resources selected by academics embody a community of practice discourse that reflect the shared understandings of a disciplinary (academic) community. Finally, the teaching and learning materials selected for a university course align with a disciplinary pedagogic discourse that reflects the history and development of the discipline (in the context of content development in University teaching and learning). The materials also reflect the teaching and pedagogic identity of the course designer as both a representation of professional expertise and as wider University teachers who also undertake other disciplinary roles in a changing social context (of University teaching).

Methodology

In the collection of data for this study, multiple data sources were used so that various perspectives could be gathered. Such triangulation of data reflects the way that the study has been designed to collect and analyse data from different sources. The approach adds validity and reliability by collecting a variety of evidence from different sources in relation to the role of university teaching and learning materials. Analysis of this extensive collection of data then enhances the robustness of the study's conclusions. The use of multiple data sources from different perspectives on the same issue as outlined below, was a significant aspect of the research presented here.

Course coordinator interviews

Firstly, exploratory interviews with university course coordinators were conducted. This study required the conduct of individual interviews from twelve university courses (Accounting 1st year, Allied Health 4th year, Law 2nd year, Law 3rd year, Biology 1st year, Sociology 1st year, Chemistry 1st year, Marketing 1st year, Maths for Teachers 1st year, Education Psychology 2nd year, Mathematical Reasoning 1st year, Early Childhood Education 1st Year). The sample of 12 courses selected for the research project came from the discipline offerings of seven universities. The sample reflected a range of Australian universities, inclusive of both humanities and science discipline based-courses, and a range of student cohort course sizes. These specific characteristics of both university and course samples are outlined in the following tables:

Table 1 University Sample Characteristics

| Characteristics | No. of Universities |
|------------------------|----------------------------|
| G 8 (Sandstone) | 4 |
| Regional | 1 |
| Outer Metropolitan | 1 |
| Metropolitan | 1 |

Table 2 Discipline Sample Characteristics

| Sciences/Allied Health | Humanities/Arts |
|----------------------------------|--|
| 1 st Year Chemistry | 1 st Year Sociology |
| 1 st Year Biology | 1 st Year Accounting |
| 1 st Year Mathematics | 1 st Year Marketing |
| Masters Course, Allied Health | 2 nd Year Law |
| | 3 rd Year Law |
| | 2 nd Year Education |
| | 1 st Year Maths for Teachers |
| | 1 st Year Early Childhood Education |

Table 3 Course size in Student Numbers

| Course Size | No. of Courses. |
|--------------------|------------------------|
| 2000 + | 1 |
| 1500 + | 1 |
| 1000 → 1500 | 1 |
| 500 → 1000 | 1 |
| 250 → 500 | 4 |
| 100 → 250 | 2 |
| 100 – | 2 |

Student Interviews and Focus Groups

Course coordinators from seven of the courses initially investigated, responded to the project team with details of students who volunteered to participate in interviews and/or focus groups. In three instances the course coordinators assisted in the formation of student focus groups. In the other four courses, individual students self-nominated to the research team after a meeting time had been arranged. Two other course coordinators also responded positively to the request for student interviews but the research project team was unable to organise and manage to undertake the research for students in these courses.

The initial interviews with course coordinators provided concepts and themes that assisted in the design of a series of questions for students. This allowed the study to increase its validity as patterns found in one component of the research could be triangulated in another; and confirmed through the responses of the different participants. Overall, 26 student participants from seven courses responded to the questions in either interview or focus group format. Of this total number of students, 42% (11) were males and 58% (15) were female. Mature age students (over 25) represented 23% (6) of the sample, while 77 % (20) of the students were under 25. Student questions were developed to capture student voice (5 sets of interviews from 4 different courses, and 3 focus groups of students from 3 different courses) regarding the issue of the role and use teaching and learning materials, and elicited from students information about how their courses were resourced, and their views about how they see these learning resources contributed to their own learning. Interviews were typically of 30 minutes duration with the interview and focus group sample details presented in Table 4.

Table 4 Interview and Focus Group Student Sample Size

| Discipline | Qualitative Research | Sample Size |
|----------------------------------|----------------------|-------------|
| Education - 2 nd Year | Interview | 1 |
| Chemistry - 1 st Year | Interview | 1 |
| Maths - 1 st Year | Focus group | 9 |
| Biology – 1 st Year | Focus group | 6 |
| Law – 3 rd Year | Focus group | 6 |
| Numeracy in Action | Interview | 1 |
| Images of Early Childhood | Interview | 2 |

As previously outlined, three focus groups were convened. Each was conducted in the students' authentic learning environment to facilitate relevant discussions about learning and teaching and learning resources. An additional focus group and one interview as conducted in the course classroom. The other focus groups and interviews were conducted in the associated environment of the learning site, for example, the student common room. Each focus group was between 30 to 60 minutes duration. Interview and focus group questions are presented in Appendix A.

Interviews and focus groups were conducted during weeks 10 and 11 of Semester 1 courses 2010. Semester 1 courses are usually of 12 weeks duration. This timing was designed to allow for student completion of assessment tasks and significant course progress, but prior to the release of final grades at the end of the semester. At this stage it was expected that students would be focussed on learning, and accessing resources to support this learning. Their responses at this time should therefore then reflect significant experience in the course; active use of resources in previous assessment tasks, leading to a final assessment; engagement with the learning process in that course; and the receipt of messages about teaching and learning resources.

Research results

Feedback from course co-ordinators revealed that each course taught in the research sample included *prescribed* textbooks with the course outlines of each of the courses recommending student access to commercially published textbooks. Interestingly though, the actual use of these textbooks reflected a continuum, from the provision an *integrated core resource* that was required for use in all lectures and seminars in the course, to a *peripheral learning resource* where the prescribed text was utilised as a source of occasional background reading. Other points on the continuum included a *core resource* that provided structure to a course of study, and as a *related resource* that was considered important in providing an orientation to the course. This continuum is explored in greater detail later in the paper.

The range of teaching and learning materials used to support the courses in this study raises the issue of conceptualization of the very notion of what constitutes a 'textbook'. Traditional views of textbooks identify publishers, authors and users as key agents in their development as a closed object and product. Such objects and products reflect a particular historical, social and economic construct. Such notions associated with textbooks include the legitimization and acceptability of disciplinary knowledge; quality and characteristics of textbooks; control and authority of

knowledge; and mediation between research and learners within an academic discipline.

The development of LMS learning resource and support systems, and significant digital learning resources echo the OECD's textbook of tomorrow project which redefines such 'texts' as any digital resource actually used by teachers and learners for the collective and collaborative purpose of supporting both learning and developing new learning resources that proceed from the individual to the collective.

In this context where multiple resources are provided for student learning, it may be opportune to reconsider traditional understandings of the environment in which textbooks are used. In a context that incorporates multiple learning resources sourced and authorized by teaching teams over a considerable time, (accretion is a term used by several respondents in this study) consideration needs to be given to how such resources interact; and the capacity of resources to be linked and integrated to other resources.

In the interviews, each of the twelve courses reported the prescription of commercially published textbooks. The terminology in the course profile for this prescription varied widely, and included such descriptive terms as 'required, recommended, prescribed, and essential', to note that the textbook was considered essential for successful engagement in the course.

These terms however, have meaning only in a specific articulated construct. For example, in a number of courses the textbook provided the primary means of structuring the course of study. In some courses students were recommended strongly to purchase the text. In some courses textbook readings provided the structure for lecture and tutorial schedules, and textbook activities and problems formed the basis of weekly exercises and learning activities. At the other end of the continuum, students were informed that the textbook should be considered one of many resources. In these courses, other resources are specified and neither the course outline, tutorial structure documentation, or assessment tasks descriptors make reference to a 'recommended textbook'.

In terms of the selection of the resources that are required by students to successfully engage in their study, university course coordinators adopt this responsibility as part of their role in course design. Course coordinators are therefore solely responsible for the selection of teaching and learning resources, provision of learning artefacts through development of LMS, course resources, and communication to co-op bookshops about textbooks. Once the course is written or reviewed, and approved through the requisite university committee systems, it is shared with the teaching team.

One of the critical issues of university course management involves the selection of teaching and learning resources, and the differences of opinion between members of teaching teams. This issue was discussed in all but three interviews. One course coordinator noted that although there was mostly agreement about the selected textbook, some lecturing staff disagreed with this decision. Another course coordinator noted that although the course management team had made a decision about the text that was 'adopted' for the course, lecturing staff were still availed the

capacity to set their own text for specific strands of study. It is interesting to note however, that no lecturer in this sample had taken up the opportunity despite the fact that the course under discussion was extremely large with hundreds of students, and several 'strands' and lecturing staff. Despite not choosing to set their own text in this course, some of the lecturers had developed individual teaching and learning materials in addition to the material developed by the team, under the guidance of the course coordinator.

Discussion with course coordinators noted that a significant proportion of teaching and learning resources designed to support student learning, had 'accreted' as the result of previous teaching experiences. A significant aspect of the work of course coordinators (and that of teaching staff) involved the update and enhancement of course materials. Some course coordinators spoke of 'constantly updating' materials to reflect new knowledge, processes or expectations of an academic discipline. Another theme that emerged from these discussions centred around the availability of new editions of the textbooks; new research publications added to LMS support and online readers; and new tutorial and assessment tasks prepared by staff to meet revised course outcomes.

Examples of the criteria proposed by course coordinators for the selection of texts and other resources included the following:

Textbook is built into course for background reading and orientation to the discipline area. The text has to be up to date, scholarly and provide textbook appropriate cases (2nd Year Law)

High quality text/new edition... Supporting materials provide a bridging course for students without a Biology background. Strongly incorporated into course structure (1st Year Biology)

Teaching materials additional to the text included such resources as case studies to be examined, work samples, video/ audio presentations, power-point slides, discussion topics, quizzes, and questions related to the weekly topic. To this end, course coordinators generally selected such resources from an historical perspective, incorporating those resources that had previously been considered successful in facilitating learning, whilst discarding those resources that had not enabled the achievement of the intended student learning outcomes for the course. Materials tended to be selected on the basis of their currency in the discipline, their ability to present a contemporary view of the subject, and their capacity to elicit positive interactions amongst students. Preference was given to those materials and resources that allowed for maximum student engagement in the subject.

In responding to a question regarding how students access and use course learning resources, most course coordinators outlined the requirement for students to demonstrate capabilities such as autonomous and independent learning, self-directed and self-managed learning and problem solving, critical thinking and application of knowledge and skills to professional situations. Course coordinators also tended to discuss the way that course components had been structured to maximize student engagement, achievement, motivation and learning. Responses included "structuring such as weekly quizzes to promote engagement and identify

student difficulties and at-risk students early in courses; increasing use of continuous assessment which required student participation and identified learning problems in the early phases of courses; and discussion of student difficulties and in some cases failure rates". These components were included in course outlines, described by lecturers in the initial lectures, and added to course LMS support sites.

Many of the participants' responses also identified issues related to student learning outcomes and student learning processes. A significant number of statements were noted in course profiles in relation to how students could maximize their learning from the course through their own learning practices. Intended student behaviour, course/ lecturer expectations and the importance of metacognition were also included in course outlines and as part of the LMS support sites. These elements of course focus and course design were referred to by many of the interviewed course coordinators. Additionally, a substantial proportion of these statements provided examples of the types of student learning behaviours that would maximise deep learning and therefore successful completion of the course.

The responses provided by the student participants in this component of the research aligned with the continuum of the centrality of the textbook as outlined earlier. This suggests that student responses reflected the way that textbooks provided integrated core, core, related and peripheral teaching and learning resource in their courses (Horsley & Huntly, 2010). The research of Horsley and Huntly (2010) revealed a continuum of centrality of learning resources, depending on the importance of the resource to the successful completion of the course. Engagement with *integrated core* learning resources was perceived by students as vital to pass a course of study. These resources were used in both lectures and tutorials thus forming the basis of the course. Slightly less vital were *core* resources that were also used to a large extent in engaging with the major elements of the course. Along the continuum further was located *related* resources that were identified as providing a less vital and more 'background reading' element of the course. Finally, *peripheral resources* were identified as those included in a very wide range of recommended resources that were not considered vital to successful engagement in the course.

Responses are revealed in Table 5.

Table 5 Centrality of textbooks in tertiary courses

| Discipline | Centrality of the textbook in course resources |
|----------------------------------|--|
| Education - 2 nd Year | Related resource |
| Chemistry - 1 st Year | Integrated core resource |
| Maths - 1 st Year | Core resource |
| Biology – 1 st Year | Core resource |
| Law – 3 rd Year | Peripheral resource |
| Numeracy in Action | Integrated core resource |
| Images of Early Childhood | Peripheral resource |

From the perspective of a second year education student, the use of textbooks was primarily for “background reading and definition”, as the initial preparation for assessment tasks, and general learning. Textbooks were a related resource that complemented short and directed reading lists emailed by the lecturers; lecture notes (consisting of summaries) emailed by the lecturer; and recommended library resources. The textbook was seen as accessible and did support learning, but not at the level required for complete and successful engagement in assessment.

Another example comes from a third year law student in a course that was structured around high-order application of professional skills to legal problems. As a result in this course, textbooks presenting subject matter were seen as background reading only that supported the learning of key concepts prior to the practical application of skills. The lecturers prepared additional and specific resources for tutorials/seminars, to enable students to engage with and resolve legal problems where knowledge of the discipline was applied to practical legal issues. The students reported that the specific material prepared by lecturing staff included resources such as case summaries, LMS and online reading, and seminar preparation documents aligned to the assessment in the course. Course coordinators revealed that they developed these materials in response to sustained positive feedback from students.

Thirteen participants (50%) from this sample were in the first year of their degree. These students revealed that the pattern of use of textbooks at school was quite different to that at university, with expectations regarding the use of textbooks being more structured and consistent at school. The need for learning resources in addition to the textbook was a new requirement at university (compared to school).

All course coordinators interviewed, were aware of the cost of the commercially published materials and the cost of course readers that were available in print form from co-op bookshops. Amongst the staff interviewed for the purpose of this study, there was a general concern about the cost of materials for students. This concern was expressed in terms of equity. Course outlines (and lectures) contained a number of significant messages about equity issues, and also relayed messages related to alternatives to purchasing commercially published textbooks. Equity statements from course outlines were examined, for further depth of understanding/ analysis. With the exception of one course, the LMS site provided a range of free learning resources such as readings, lecture notes, quizzes and tutorials. Equity discussions and the canvassing of alternatives to purchasing commercially published textbooks and other materials only took place in relation to commercially published readers and printed readers for purchase.

In courses where textbooks provided the integrated core structuring of the course, students were expected to purchase the textbook. In one course the textbook was also supported with a workbook and other publisher-provided support material. Again students were encouraged to purchase and access these resources, but alternatives to purchase were noted. A number of course coordinators reported the existence of too many learning resources and that students don't actually use many of the supplementary materials. These course coordinators further reported that textbooks seemed to be a more well-accepted and used resource providing students 'with something they can hold onto that brings topics together.'

The provision of a myriad of learning resources on LMS sites was seen as problematic by some course co-ordinators. The increasingly common practice of providing more highly structured and prescriptive learning materials was seen as 'spoon feeding' by some course coordinators (2nd year course co-ordinators) that may actually result in a reduction in the capacity of students to develop the necessary skills required for professional practice. A number of course coordinators mentioned that they directed students to purchase the commercially published text due to its significant contribution to the successful completion of assessment tasks: "I'm blunt with them. It's a comprehensive text and they need to buy it for assessment."

There was considerable discussion amongst many course coordinators of the increasing use of Learning Management Systems, and the subsequent provision of an often incomprehensible number and types of related learning resources that were freely available to students. Interestingly, there seems to be little difference in the types of learning resources provided for lectures and tutorials, with the exception of the practical components of biology, chemistry and law. The question remains however, as to how student are alerted to these resources and how (if at all) the resources are scaffolded to facilitate and enhance student learning.

LMS sites are expanding (in terms of volume) at an accelerating rate as course co-ordinators respond to national standards for their subject; institutional demands for comprehensive resourcing of topics and knowledge sources; the push for online modes of delivery of resources and teaching; and client demand for flexibility of delivery of teaching and learning resources. In many faculties that are linked to professions, the professions are developing graduate standards that require increased subject matter content to be placed on LMS support sites and integrated into degree studies. Increasingly university courses must respond to external audit and compliance requirements.

This expansion of material on LMS sites forces students to try to guess what is valued in terms of concepts, resources and assessment in the course. It compels them to make selections based on inadequate understanding on the subject matter and learning design of the course. Course coordinators oblige students into guessing what is valued in the course by the over-provision of a multitude of course resources. The successful completion of assessment tasks provides the great common denominator and motivating factor involved in this guesswork.

University education with large class sizes presents specific problems for teaching staff including the identification of students' prior learning; in producing opportunities to interact with students; and in preparing specific teaching and learning materials to meet student needs. University teachers, such as the course coordinators interviewed in this study, have significant experience in teaching their courses. As a result they identified predicted prior learning for new student cohorts based on prior experience with previous, similar groups.

In one humanities course, a pre-test was administered to identify the student cohort level of knowledge and skills. The selection of weekly class content, and the structure of learning topics and activities that were 'sped up' or 'slowed down' based on prior learning, were planned as a direct result of the findings revealed in the pre-test. In this particular course involving a relatively small group, evidence was also

collected by the lecturer through observation of students in class, and through asking questions and checking progress. This information was then used to refine planning and future activity development.

In another humanities-based course (a very large first year cohort) the course coordinator identified the geographic origin of the students as requiring special consideration, as many were international students. This knowledge was used to construct cases in the course that reflected the geographic and cultural background of the students. In one large first year science course, classes were streamed based on New South Wales secondary school performance. This allowed classes to be tailored to groups of students based on prior assessment performance. Classes were also streamed based on the professional pathway of the students and on any prior study of the subject.

In a science-based course, requisite skills were mapped throughout the course to identify prior knowledge gaps. The provision of seminars which consisted of supported and guided skill applications and structured problem-solving followed by more independent and student self directed seminars, provided knowledge of the prior learning of students. This knowledge was used to plan to build complicity in professional reasoning in areas of the knowledge and skill application that was deemed 'more difficult'. Lecturers packaged and structured the material differently and approached key concepts and problems solving more slowly, in response to student readiness.

In another large first year science class, a significant aspect of prior learning was whether or not a student has studied the subject at school. In the case where a large number of the cohort had limited prior knowledge, the first six weeks of the course refreshed and enhanced secondary school subject knowledge. Additionally, lecturers reported being aware of topics and concepts that had proved difficult to previous cohorts, and so a series of specialized tutorials were developed to meet this learning need. Students without prior subject background study were encouraged to enrol in an online 'bridging' course offered by the publishers who provided this course as a supplementary to the recommended textbook.

In one science-based course, the course coordinator reported that lecturers focused on clinical reasoning as the key outcome of the course. As a result, lecturers employed a process of dynamic assessment in lectures and tutorials, which required teacher-student interaction to diagnose students' prior knowledge and proficiency, and then develop adaptive support (in the development of clinical reasoning).

The interview data of this research project included significant discussion about the nature and characteristics of the contemporary university student demographic. Some social researchers regard this current group of students as Generation Y. Others consider terms and labels such as Generation Y as deeply offensive, as its reductionist paradigm characterizes young people with a single personality, identity and behaviour. However, course coordinators across both science and humanities disciplines detected changes in student attitudes, perceptions and behaviour, expressed in the following ways.

Students want us to have and do everything for them.

We are asked to reissue the lecture notes if there is a small change in the lecture.

Nowadays students' expectations are very different from even a few years ago.

We have to be more careful in helping students save face.

Current students exhibit a sense of fragility that is masked by scrappiness, aggression and directness.

Students are expecting that tutorials and tutors should summarise the lecture.

For one lecturer these changes can be explained by students spending a lot less time on campus. As a result, students are not as engaged in life at university, attempting instead to 'get through' uni with minimal effort. They are increasingly considered 'spoon fed' and there evidence points to a lack of engagement and lack of responsibility for their own learning. One lecturer however, revealed that this trend had been observed for several years, but that things were improving:

Three to four years ago, they [the students] believed they paid so they got a degree. Now the school is addressing this – students are better informed and understand that skills have to be acquired.

There is no assumed prior learning in courses without pre-requisite study. Learning resources reflect this understanding. Students reported that in some first year courses the first few weeks consisted of year 12 revision. Students also reported that online bridging courses provided by publishers (in relation to first year textbooks) were useful because otherwise teaching and learning resources do not account for their prior learning. A number of interview questions were designed to elicit responses about how courses were structured. The responses mostly referred to the way that course coordinators structured courses structures, and developed specific learning activities and assessment tasks that were designed to achieve course (and student) outcomes.

From the perspective of lecturers and course coordinators, these outcomes include:

- supporting learning and reducing drop out and failure rates;
- building structures for future learning;
- facilitating students learning;
- providing engagement and connection through the development of an activity (student) path;
- increasing involvement through encouraging attendance;
- linking course components;
- facilitating metacognition;
- scaffolding for specific disciplinary content (e.g. analysing cases by providing a demonstration case); and
- modelling application of knowledge and skills.

One example of the rationale behind course design is that for an accounting course.

In this very large course the structure was designed to promote weekly engagement, learning activity and interaction in tutorials. Students completed the tutorial problems, marked them themselves and then attended tutorials, and were thus prepared to ask accounting experts questions related to their prior

learning activities in doing the tutorial problems. These and other course components are linked to promote interaction in the zone of proximal development. This course design is described in detail in the course outline. The interactiveness of engagement, assessment, learning resources, course design and structuring is highly evident.

Another example is from a chemistry course:

The week-by-week structure of the course and provision of activities that link lectures and tutorials, promote engagement and success and identify students at risk. Every year the LMS becomes more sophisticated and highly structured. Lab work is still critical and some lectures have become more student-centred as students nowadays require more highly structured materials. There is a different cultural practice. Students nowadays are assessment driven and will not undertake tasks that are not assessed. Each highly structured learning task (and each lecture and lab etc) is seen as separate and there is much less transfer of knowledge and skills from each unit to unit. 'Which lecture and which slide?' Although some assessment tasks are more problem-based the students have less problem-based activity and less capacity and resolve to solve problems.

Many LMS course support sites provide discussion boards and other forums designed to promote interaction, however due to time constraints, students reported minimal engagement. Some students reported their online interaction as "watch and read" without contribution. This was in contrast to the opportunities for interaction in face-to-face tutorials and lectures and seminars.

With regard to processes in the LMS identified as being of enhancing student learning, students reported that the most useful part of the LMS was its ability to provide instant access to assessment-related material. They described the use of LMS sites as reflecting a series of steps. Firstly, they scan resources for material related to assessment. They then frequently 'googled' online material and discussion boards for assessment related information. Students reported that almost all use of LMS sites was related to assessment. They reported they did not access most of the material on LMS sites if not directly related to their assessment tasks. Although LMS sites and course support are valued, lectures were still regarded as providing the most desirable context for orientation to the subject under study and its resources. Lectures were also seen to promote relationships between the discipline and the student.

The time-poor nature of the student experience and the extent of paid employment has been recognised as a critical factor in 2010 university study. The results of student interviews and focus groups highlighted the relationship between course design and the way that information is chunked and packaged, and the time poor nature of the contemporary university student.

In relation to teaching and learning resources, the outcomes of this study suggest that student preference is for fast access to specific assessment-related information rather than broad in-depth analytical reading on the topics and concepts. As a result,

students report less preference for lengthy textbooks and readings, preferring especially lecture notes, web resources and 'dummies' guides to a specific assessment task. Assessment has now become central to engagement in the course and the driver of resource engagement and access, as students are reluctant to use texts unless part of, or directly related to assessment. Evidence from this study suggests that cost of textbooks is less a factor if the text provides time-efficient access to materials that enhance potential successful completion of assessment tasks.

Therefore, all learning resources are evaluated and selected by students on the basis of their ability to assist in the completion assessment tasks. This utility filter is applied by students in the way they respond to questions about how resources are accessed and used. From the student perspective the *critical feature* of learning resources is their potential to be easily accessible and to provide support in the completion of assessment tasks. It would seem therefore that there are no real resource shifts from the perspective of student use of resources. Rather, learning resources are seen to be complementary, in the way that they support and scaffold student completion of assessment tasks.

Data collected for the current study suggest that as students progressed in their programs, they became more discerning and time-efficient in the accessing, selection and use of learning resources that contribute to assessment completion. First year students did the 'hard yards' in attempting to access all the multitude of resources available whether described 'core' or 'supplementary'. They did so under the impression that this would enhance their capacity to engage successfully in assignments and exams. Second and third year students however, had developed a form of 'learning resource radar', where they only skimmed most resources, concentrating more on the ones that had been identified (by themselves, fellow students or lecturers) as being most useful to assessment completion. In some ways the further students travelled down the study track, the more attuned they became to the reading of the subtle 'codes' provided by teaching staff and the learning resources themselves. This is seen as a survival skill in the time-poor environment of the contemporary student.

Conclusion

Higher education teaching and learning is a complex area for research and analysis. Unlike many studies in higher education, this study included the views of course designers and course coordinators as well as students, in the analysis of the role of teaching and learning materials. However, due to the qualitative nature of the research, the student sample is small. It was apparent from the results, that course coordinators are passionate about their courses and their teaching. This enthusiasm and commitment transferred into course design that attempted to maximise student engagement and learning.

Textbooks produced by commercial publishers were recommended in every university course under investigation. The use of these textbooks reflects a typology of integration into the learning design of the course to support student learning. This typology reflects a continuum of resource use ranging from an integrated core

resource that provides the structure of a course of study to peripheral resources that reflect some background reading for a course (Horsley & Huntly, 2010).

In relation to the possible affect of the increasing use of university e.learning technologies, there does seem to be a subtle shift in the selection and use of associated learning resources by university students who indicated that they are time-poor, thus affecting their capacity to engage fully with all learning resources recommended by university teaching staff. Although students did listen to the messages about learning resources conveyed by their tutors, their motivation was driven by the demands of their course assessment. This, coupled with time restraints, led to a situation where students' prioritised their focus on specific resources. The resources at the top of the priority list related specifically to successful completion of assessment tasks. The results of this study send a powerful message to course designers in that, given the student priority of accessing resources that specifically enhance assessment success, the nature and complexity of assessment tasks needs to figure prominently and thoughtfully in any course design.

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Associate Professor Mike Horsley, Professor Bruce Knight and Associate Professor Helen Huntly are a research team from Central Queensland University, conducting a number of studies into the ecology of learning for students and teachers in university study. Their focus has been to explore the way that changes in e-learning influence the entire learning ecology in university study.

APPENDIX A

Student interview and focus group questions

Demographics

Male: Female: Domestic/International
Age: 18-25 26-34 35-44 45+
Year of study: First Second Third Fourth
Have you previously failed any courses in your program? Yes No

Questions

1. What standard (eg. HD/Pass) do you want to achieve in this course?
2. What learning resources do you use to study in this course/subject for:
Lectures Tutorials Assessment items
3. Which teaching/learning resources from this course have you found most/least engaging and why?
Lectures Tutorials Assessment Items
4. How (if at all) is your use of learning resources different at university, than at school?
- 5a) How is your prior learning/and or discipline knowledge catered for in the use of resources?
- 5b) Is this monitored throughout the course?
- 6a) How are you engaging with the resources?
- 6b) Motivation and the dynamics operating in the environment?
- 6c) Do you use the resources as core, complementary (supplementary) or as periphery?
- 6d) Do you share the costs of resources?
- 6e) Do you use the resources to interact with others, share ideas?
- 7a) What are a lecturers' expectations concerning the use of resources?
- 7b) Are these made explicit?
- 8) What messages do you get from your lecturers/tutors in this course regarding:
 - a) Textbooks:
 - b) Other learning resources:
- 9a) What opportunities for learning (eg knowledge retention vs application of concepts etc) are you offered by the resources used in the course?
- 9b) How is this learning measured?
- 9c) Is there too much spoon-feeding and use of templates used that hinder your learning and the application of concepts?
- 10) What processes in the LMS are of most use to your engagement in the learning?
- 11) (Second and Third Years) have you noticed a change in the type and use of resources over your program of study?