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The ecology of change and continuity in the use of textbooks in higher education

Abstract:

This paper explores the relationships between e-learning and textbooks designed to support student learning in higher education. Ellis and Goodyear, in their seminal publication *Student experiences of e-learning in higher education* (2010) have sought to re-position research on e-learning in higher education in the context of a broader ecology of learning. This broader learning ecology incorporates other components of both the student learning and course development process such as lectures and textbooks. It especially focuses on how aspects of the learning environment and its learning ecology interact in shaping student experiences of learning – and the way that students shape the opportunities designed by the university and its lecturing and course design staff. This paper reports results from a wide-ranging study of the learning resources that are provided for students in 12 university courses drawn equally from the humanities and sciences.

Biographical notes:

Dr Bruce Allen Knight is Professor of Education at Central Queensland University. His research interests are in learning design and pedagogy. He has more than 200 publications and worked on large research projects worth more than $5 million from such granting bodies as the Australian Research Council. In 2006, he was honoured with a Fellowship of the International Academy of Research in Learning Disabilities.

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Keywords:

Writing – E-learning – Textbooks – Learning resources – Higher education

Background to the research

Context

Twenty-first century students themselves generally are in paid work as well as enrolled in full-time courses (Berry, Cook, Hill & Stevens 2011, Horsley & Huntly 2010). A review of Higher Education in Australia (Bradley 2008) identified a number of challenges in providing students with stimulating and rewarding higher education experiences in the context of substantial changes in the profile of the higher education student population. These challenges include increased use of casual teaching staff; a decline in face to face teaching, although this type of teaching is highly valued by students (Horsley, Knight & Huntly 2010); and a heavy reliance on ICT in teaching (which may disadvantage students from low SES). The Bradley Review (2008) also noted low levels of student satisfaction in the provision of teaching and support services and learning resources.

Textbooks in higher education

Prescribed textbooks are frequently used in business and science courses, and not as much in the humanities and social sciences (Wiley 2008). Academic textbooks support the study of disciplines in higher education courses where they support academics in developing students' learning outcomes (Reynolds 2011). However, the role of textbooks in Education 1.0 was to integrate knowledge (Fasso, Knight & Knight in press-a). Increasingly, students are engaging and interacting with multiple sources of information using self-selected web tools to support individually determined social networks accompanied by the breakdown of boundaries between disciplines (Fasso, Knight & Knight, in press-b).

Learning management systems (LMS) are used by higher education institutions to provide course websites with teaching and learning resources, support materials and networking and online communication technologies intended to support students in their studies. Often these supports are linked to a wide array of library services and supported by commercially produced textbooks and published course packs, comprising a knowledge base of readings from a variety of commercial and non-commercial books and journals. The development of LMS systems and digital learning resources echo the OECD's 'textbook of tomorrow' project which redefines such 'texts' as any digital resource used by teachers and learners for the collective and collaborative purpose of supporting learning and developing new learning resources that proceed from the individual to the collective.

High quality textbooks and digital learning materials contribute to the quality of students' learning experiences as students engage and interact with materials (Berry et al. 2011, Lockyer, Bennett, Agostinho & Harper 2009). The development of online learning resources and embedding digital technologies in online learning delivery is the subject of many thousands of research studies in higher education. One count (Horsley & Huntly 2010) suggested that over 4,000 studies are produced annually on the technology for teaching and learning in higher education.

However, university courses are also supported by commercially produced textbooks. Many of these textbooks have been produced for specific courses, and can be set as essential or recommended resources for students. Increasingly, these textbooks contain pedagogic features to assist learning; online support and online teaching and learning resources; and specific packages for lecturers and tutors providing support for teaching. Each Australian university campus contains a campus bookshop dedicated to supplying these textbooks. An Australian study of 12 University courses at 7 Australian universities (Horsley, Knight & Huntly 2010) reported that 100 per cent of the courses reviewed (in Chemistry, Biology, Allied Health, Mathematics, Sociology, Accounting, Marketing, Law and Education) set a commercially produced textbook as recommended texts and required reading. Despite this fact, in the period 2000-2010, only 6 studies explored the role of textbooks in higher education teaching and learning. There are very few studies on the use of textbooks in tertiary teaching and learning as it is assumed that the textbook, even in electronic form is irrelevant in a personalised and networked Education 3.0 world. However, textbooks continue to be a key teaching and learning resource for students in Higher Education and therefore it is likely that the content they use may still exist in some form (Knight 2013; Horsley, Knight & Huntly 2010).

New data developed by the researchers, document the scope and role of commercially published textbooks in Australian Higher Education (see Fig. 1). The data is sourced from the Australian Publishers Association's tertiary and professional committee. The APA collects monthly sales data from educational publishers that belong to the industry association (the APA). These charts show the volume of sales of tertiary textbooks 2007-2010 and the number of titles sold, in both aggregate volume and by per student average. The results are surprising. Tertiary textbook publication is a major cultural industry in Australia, representing almost 30 per cent of Australia's publishing industry. However, it has been reported that the vast majority of students do not regard the textbook as a critical part of their learning and indicate that they do not read the textbook (Berry et al. 2011, Clump, Bauer & Bradley 2004, Phillips & Phillips 2007, Durwin & Sherman 2008). Reynolds (2011) considers that in economic terms, textbooks that are not fully utilised by teaching staff or not absolutely essential for satisfying course requirements could be categorised as a luxury item.

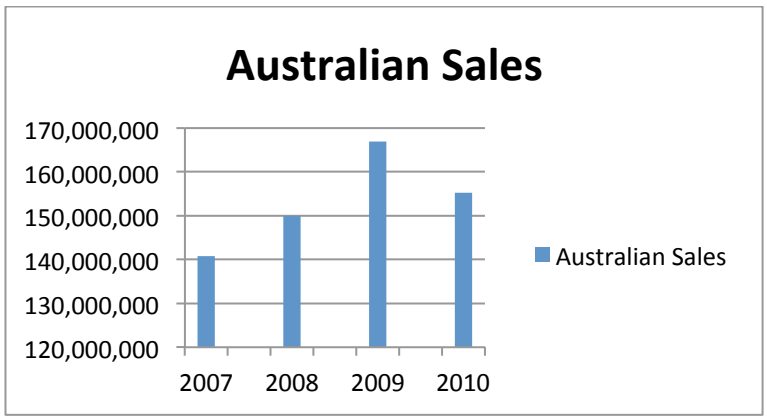

Fig. 1. Nominal sales of tertiary textbooks by Australian publishers 2007-2010 in AUD

Although the purchase of a textbook does not equate to reading the text and then to enhancing learning, the fact that they are being purchased (as evidenced in the figure above) demonstrates that they are currently serving a purpose in higher education. Students in 2010 spent on average $130 AUD on purchasing 2.6 textbooks. A student entering a four year degree in 2007, will spend on average $554 AUD on 11 textbooks during the course of their four year degree. Also, in the period from 2007-2010 the spending on textbooks varied on average per student between $130 to $147 AUD annually. Finally, during the period 2007-2010, spending on textbooks across most disciplines remained constant despite the increasing quantity of digital resources developed by Universities in Australia. However, this level of spending may not continue as students demand and get free access to quality information online (Dua 2013, Knight 2013). In the global context, Amazon has reported that since 2011 its sales of eBooks (of which E-textbooks are a subset) had exceeded printed books, with the publisher encouraging potential textbook authors to publish online (Amazon 2013).

This data can be used to provide some insights into a number of critical issues that are framing the current debate about teaching and learning resources in higher education. In the USA, because of the increasing costs of textbooks, The Higher Education Opportunity Act (2008) was passed to make academics and universities aware of the importance of using the assigned textbook as an essential resource for teaching and learning.

Trends for textbook use

Wesch argues that 'there is a massive gap appearing now between what the publishing industry produces and the business models that are used and what Generation Y and Z want in learning resources' (2010). He also contends that the Internet will drive content consumption patterns among young students. His research has sparked debate and the creation of open learning networks which encourage teachers to produce their own content and share it online with other teachers, bypasses publisher's content. This open textbook publishing offers prospects for authors to form a community of practice with other academics and students and create digital resources. Wesch goes on to assert:

> that the wider implications of this are catastrophic for content industries ... if note isn't taken about this wide scale shift in the way that content is consumed and what the consumer actually wants in terms of business models, then it could lead to the end of educational publishing (2010).

In fact it has been proposed that a potential open eTextbook will be a 'self-generating, self-sustaining, crowd sourced, open access wiki book, changing constantly, developed by everyone and owned by no-one' (Chesser 2011: 28).

Taylor has suggested that the use of Web 2.0 tools that support interactivity has the potential to develop eTextbooks by 'fostering a paradigm shift that is disrupting and decentralizing standard publishing models' (2011: 74). However, this view is not supported by the evidence presented above. In fact other research points to a rise in

the role that traditional textbooks (and their digital variants) are playing in higher education. For example, research at the University of Adelaide (Lindsay 2011) was conducted on the provision of iPads to all incoming first year students in the Faculty of Science. Initial reports noted that although the introduction of the devices improved retention rates, an almost counter intuitive outcome was the proportion of students buying textbooks rising from a third to a half. In the pre-iPad era students would be facing a bill of $1000 a year for their textbooks. Thanks to their ability to source e-textbooks for the iPad, that expense has now dropped to $600 making textbooks more affordable.

New business models to provide textbooks at reduced prices have been developed. Student entrepreneurs have developed websites that allow students to compare the prices of textbooks and order online at lowest cost; whilst others have developed textbook rental schemes to reduce the cost and extend the use of textbooks. The larger educational publishers have now created their own eLearning resources accessed through web-based portals where content can be adapted and used by students as they interact with a wide variety of multimedia resources offering new opportunities for the customisation of teaching support in the higher education sector (Hallam 2012).

These trends and the data presented above raise new research questions about the development and use of learning resources, including textbooks, in higher education. The study reported here explores the way that teaching and learning resources are scaffolded; the disciplinary voices that guide their use in the learning environment; the digital behaviour of students in multi-modal learning environments; and whether resource shifts are occuring between different types of learning resources.

Methodology

The research uses a mixed mode methodology with the methodological frame being interpretative ethnography. A multidata gathering approach was used in the study, with firstly, exploratory interviews with 12 course coordinators who managed and led university courses in 2010. These course coordinators were responsible for the design of the courses and also for the selection and provision of teaching and learning resources to support student achievement and development. Secondly, a series of observations of initial lectures to identify messages about and scaffolding of teaching and learning resources by course coordinators were conducted. Finally, student interviews were used to develop awareness from their perspective on the use of textbooks and other resources in their learning and development.

University participants

A sample of 12 courses from 7 Universities was selected for the research project. Four universities were from the prestigious sandstone universities widely regarded as the ‘top’ Australian Group of Eight (GO8), while one university was metropolitan in a large city, one was outer metropolitan and one was from a regional area. Course numbers ranged from more than 2,000 students (1 course), 1,500-2,000 students (1 course), 1,000-1,500 students (1 course), 500-1,000 students (1 course), 250-500

students (4 courses), 100 to 250 students (2 courses) and less than 100 students (2 courses).

Courses

Calls were made to universities outlining the purpose of the research and requests to participate. Course coordinators who responded and agreed to be involved represented 1st Year Accounting, 1st Year Biology, 1st Year Chemistry, 1st Year Early Childhood Education, 1st Year Marketing, 1st Year Mathematics For Primary Teachers, 1st Year Mathematical Reasoning, 1st Year Sociology, 2nd Year Education Psychology, 2nd Year Law, 3rd Year Law, and 4th Year Allied Health.

The questions for the interviews were developed to elicit from course coordinators and lecturing staff aspects of the design of courses and the resources underpinning this design. The questions were developed to identify the processes underpinning evaluation, selection and provision of textbooks and other learning resources for student learning. The questions planned to identify trends in the provision of teaching and learning resources; university policies and priorities; and course and structuring aspects of the different courses. The interviews were typically of 45 minutes duration, ranging from 30 to 75 minutes.

Observation sample

A series of observations was then conducted on initial lectures to identify messages about and scaffolding of teaching and learning resources by course coordinators. Each of twelve course coordinators who participated in the initial interviews was invited to have their first or second lectures in their courses observed by members of the research team. On four occasions, the course coordinator agreed to be interviewed immediately prior to the lecture, which was then observed. In the other five cases, interviews were conducted with the research team, who then observed the lectures at a different time. The requirement to observe the initial lecture in each course was not able to be physically accommodated in a number of cases, as most lectures in most universities occur in the first week of the semester of study. One lecturer in Arts Education for primary students volunteered to be included in the observation sample after being unavailable for a course coordinator interview.

The requirement to observe the initial lecture of each course was deliberately planned, as it was expected that messages about teaching and learning resources would feature more prominently in an initial lecture. The second lecture of three courses was also observed to identify the primary messages about teaching and learning resources.

Observation instrument: SOLOR

The lectures were analysed through the use of an observational schedule. The development of the Scaffolding Of Learning Observational Record (SOLOR) was initiated by the research team in response to the need to collect data that would inform the research question relating to how (if at all) tertiary teachers introduced textbooks

and other learning resources to the learning environment (Horsley & Huntly 2010). The instrument required the capacity to record specific reference to learning resources during the first session scheduled for the delivery of a university course. It was also designed so that researchers could note any teaching and learning strategies utilised in the scaffolding of learning in a subsequent course session.

Data generation in this observation component comprised two elements and raised three data sets. A digital camera was used to record the lecture. During the lecture a researcher recorded details on a paper-based SOLOR schedule. During the data analysis period, a separate recording on the SOLOR observational schedule using the recorded lectures was completed independently by another member of the research team.

The research used a single camera approach, mostly trained on the lecturers. Each lecture was observed in this way with a camera recording the lecture and a trained observer recording data using the SOLOR observational instrument.

Student interviews

Twenty-six participants from seven courses of the initial 12 courses identified, responded to questions in either interview or focus group form. Of this total number of students 42 per cent (11) were male and 58 per cent (15) were female. Mature age students (over 25) represented 23 per cent (6) of the sample, while 77 per cent (20) of the students were under 25.

Three focus groups of students from 3 different courses (1st Year Biology [6 students], 1st Year Mathematical Reasoning [9 students], 3rd Year Law [6 students]) were interviewed as well as 4 individual interviews of students representing 1st Year Chemistry, 1st Year Early Childhood Education, 1st Year Mathematics for Primary Teachers, 2nd Year Educational Psychology.

The questions for the student interviews and focus groups were designed to triangulate and enhance the data collected in the interviews with course coordinators and in the lecture observations. The questions were developed to capture student voice in the consideration of textbooks and other learning materials, and elicited from students how their courses are resourced and the way they see these resources contributing to their learning and development. In each interview or focus group the questions served as triggers for discussions about teaching and learning materials and their role in supporting teaching and learning.

Results and discussion

Student engagement

This research reports that regardless of the program of study, students are reliant on paid work to cover the cost of university study, and therefore are time poor and selective about engagement in courses. 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 topic and concepts. As a result, students reported less preference for lengthy textbooks and readings, preferring especially lecture notes, web resources and guides to a specific assessment task. Assessment thus has now become a central driver of student engagement in the course, and in this study, students were reluctant to use texts unless part of or directly related to assessment. Zucker has similarly reported that a substantial number of students (53per cent) have used etextbooks because it was easier to navigate the digital content and therefore satisfy expectations of participation in class activities (2012).

E-learning and textbooks: the complementary ecology

The range of teaching and learning materials used to support the courses in this study raises the issue of conceptualisation of the very notion of what constitutes a 'textbook'. Traditional views of textbooks identify publishers, authors and users as key agents in the development of textbooks as closed objects and products. Such objects and products reflect a particular historical, social and economic construct. Notions associated with textbooks expressed by participants in this study included the legitimisation and acceptability of disciplinary knowledge; quality and characteristics of textbooks; control and authority of knowledge; and mediation between researchers and learners within an academic discipline.

Where in the past, teachers rarely discussed their resource use in schools and universities, the proliferation of LMS support materials such as tutorial support and structuring, online learning quizzes (sometimes shared between universities), staff-written learning problems, etc. represent a bottom up collective approach to the development of teaching and learning resources that reflects specific disciplinary communities of practice. We argue that a central element in designing a higher education course is to ensure that the learning resources are integrated and that explicit guidance in their use is clearly articulated. Hallam reports that students are unlikely to use electronic resources if lecturers do not integrate them into their teaching (2012). Reynolds asserts that the use of digital resources necessitates the need to develop innovative pedagogies that are responsive to and manage the interaction of teaching, the development of information literacy skills, learning outcomes and student needs (2012).

Ellis and Goodyear, in their seminal publication *Student Experiences of E-Learning in Higher Education* (2010), have sought to re-position research on e-learning in higher education in the context of a broader ecology of learning. This broader learning ecology incorporates other components of both the student learning and the course development process. It especially focuses on how aspects of the learning environment and its learning ecology interact in shaping student experience of learning – and the way that students shape the opportunities designed by the university and its lecturing and course design staff. This view, which has been articulated in a number of publications, posits the view that the effectiveness of students' e-learning experiences can only be clearly framed and understood when

considered in relation to the other aspects of the students' wider learning experience, and the epistemic agency of students as they co-construct their learning experiences (Goodyear & Retalis 2010, Ellis & Goodyear 2010).

Furthermore, they have proposed that in considering e-learning, both the students' learning experiences and teachers' design ecology are vital broader ecologies of learning; in which the student e-learning experience and teachers e-learning design are but a part of a more complex and broader learning ecology. In summarising the impact of this way of approaching e-learning research, they conclude that:

> when teachers do not focus on the development of student understanding, and have poor conceptions of learning technologies, they tend to use e-learning as a way of delivering information … teachers who focus on the development of student understanding and have richer conceptions of learning technologies, not only integrate e-learning into their approach to teaching, but stress the integration of the physical and the virtual (Ellis & Goodyear 2010: 27**)**.

An outcome of such an approach could be that a decline in face to face interaction in some disciplines may encourage students to use authoritative sources such as textbooks to do the 'heavy lifting' of explaining discipline concepts. The results of this study suggest that this may be a reason why many courses are recommending texts to direct their students' learning.

Typologies of centrality

Data generated by the study has enabled the use of textbooks to be analysed according to their intended and actual use by students. Four categories have been developed (Knight & Horsley 2011) that include core integration, core resource, related resource and peripheral resource.

Core integration

This structure presents the textbook as providing the scope, sequence and learning activities of the course. The LMS materials will complement the textbooks, with tutorial activities structured around the activities and resources in the textbook. Additional lecture notes and other materials, work samples, cases and additional materials should complement the core textbook, presenting as an 'integrated core' role for textbooks. In this study, some courses have been designed to use textbooks in this way and may reflect the volume of sales of texts highlighted in Figure 1. We believe that this use of textbooks is what the USA Higher Education Opportunity Act (2008) was designed to promote, with the use of texts as an integrated core resource for teaching and learning.

Core resource

Textbooks in this category will play a significant role in the structure of the course. Course outlines, including lecture and tutorial readings, should relate to particular

sections of the textbook, although not necessarily based on the textbook. Lecture material embedded in the LMS may provide alternative material, in some cases, from a different perspective to sections in the textbook. Additional and different material (eg practicum materials) from that provided in the textbooks are provided on-line to support student learning and used as core to the courses. Courses in this study, especially in the sciences and business disciplines commonly used the textbook in this manner. It is assumed that when texts are prescribed in such courses that students will seek to access the texts in some way, be it purchasing, sharing or borrowing.

Related resource

The role of textbooks described as *related* provides a wide range of resources to support student learning, with textbooks being one of the resources. Other resources may include structured readings and a wide range of additional readings, lecture notes, references and library resources. In this role, textbooks are not considered more important than any other of the range of learning resources provided to support student learning. When used as a related resource, students will not usually purchase the text (Knight 2013).

Peripheral resource

Textbooks that provide background reading for students or an orientation to a course could be described as a reference or *peripheral resource*. In such circumstances textbook chapters may be set as readings for lectures and tutorials and because they generally would be regarded as optional students usually will not purchase them.

Conclusion

Higher education teaching and learning is a complex area for research and analysis. Unlike many studies in higher education teaching and learning, this study included the views of course designers and course coordinators from a broad range of courses, as well as students in the analysis of the role of teaching and learning materials.

As a result of the development of Web 2.0 technologies and the potential impact on students' learning, 'the knowledge, activities, relationships and resources involved in student learning are becoming more fluid, and are entering into more complex combinations' (Markauskaite & Goodyear 2009: 615). Textbooks can provide the scope, sequence and learning activities of a discipline course, with Learning Management System resources complementing the use of the text.

The study reported here is limited in a number of ways. Firstly, data was gathered from a small number of participants in specific disciplines who reported their personal beliefs and experiences. Secondly, the participants were part of a sample that volunteered to participate and therefore are not representative of lecturers in different disciplines in these and other higher education institutions. The results do show, however, that in some disciplines textbooks do play an important role demonstrating legitimisation and acceptability of disciplinary knowledge and providing direction for

students' learning. With current developments and a massive uptake of online course delivery in the higher education sector, it will be interesting to see how students and lecturers adapt and respond to the use of learning resources to satisfy the demands of knowledge acquisition, creation and management in higher education.

Hallam suggests that:

> There will be expectations for publishers to offer differentiated eTextbooks with features that make students more engaged with and more excited about their learning, so that ultimately the print textbook as we know it today will be replaced by a flexible digital alternative (2012: 53).

The challenge for authors of e-texts will be to provide reliable, organised content that can be built upon by learners to transform their learning (Knight 2013).

> The rapid pace of informational and technological change from Education1.0 to 3.0 and 4.0 signifies responses to new technologies and the shifting expectations of users to interact and collaborate with each other as creators in a series of overlapping and interacting on-line communities drawn together by the activity of the learner' (Fasso, Knight & Knight, in press-a).

The developments in the higher education context have the capacity to change the relationship between teaching and learning materials (including textbooks and other resources) and teaching. As suggested by Horsley and Huntly: 'the development of such collective resources has the capacity to: (a) redefine notions of teacher professional identity; (b) develop new relationships between teachers and teaching and learning materials; (c) change notions of the life cycle of resources now that more of them are presented in digital learning resource form; and, (d) develop new possibilities in customisation and specialisation (2010: 58). We look forward to the challenge.

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