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Digital Literacies in Higher Education: exploring textual and technological practice

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Abstract

Concerns are frequently raised about undergraduates being so immersed in web-based technologies in their broader lives that they have difficulties engaging in more conventional study practices, such as academic reading and writing essays. The research reported on here examines this issue through a literacies lens. The project findings illustrate the complex interrelationship between literacies and technologies with the potential to disrupt traditional academic literacy practices. However, they also offer strong evidence for students' ongoing reliance on the authority of the institution when it comes to accessing and utilizing web-based resources for their assignments. The authors suggest that in order to understand the changes that are taking place for learners in today's higher education more attention needs to be paid to textual practice around learning and less upon the technologies and their applications.

Introduction

Many of today's undergraduates bring to their studies a wealth of experience of using web-based technologies in their day to day lives. As a consequence, concerns are often raised by tutors about students' ability to engage in more conventional study practices, such as reading for and completing essays. In response, this article reports on research which has taken a literacies lens in order to examine how students use technologies in and outside the curriculum. Research has been carried out in three very different higher education institutions. The data show students as highly adept at drawing on technologically-mediated, hybrid textual genres in the process of meaning making. It illustrates the interrelationship of literacies and technologies with the potential to disrupt some of the more conventional literacy practices of the academy. However, despite the wide range of resources available to them, the article suggests that what remains constant is students' reliance on the authority of the institution when it comes to accessing and utilizing resources for their assessed work. It argues that any changing status of knowledge in universities comes primarily not from students' own web-based activity but from the universities themselves, as a diverse range of texts are brought into the academy and valorized in a range of assessment practices. The authors conclude that, in order to understand the changes that are taking place for learners in today's higher education, we need to pay more attention to textual practice around learning and focus less upon the technologies and their applications.

Background

This article reports upon an Economic and Social Research Council funded research project which has been exploring the nature of digital literacies in higher education (Digital Literacies in Higher Education Award no RES-000-22-2470 <http://digital-literacies.open.ac.uk/home>). It is set against the backdrop of rapid growth in the use of digital technologies in communication amongst a generation who have grown up using these technologies in their day to day lives. We know that today's students are engaging with digital texts (texting, online chat, web browsing, social networking and video sites, downloading music) in ways that may seem far removed from the more conventional literacy demands of university study. Simultaneously, web-based learning environments, notions of connectivity, the potential of social networking, digital and mobile technologies are permeating the academy, not only through student practice but in terms of dominant institutional drivers and government led funding to harness technologies and applications for supporting teaching and learning. The main aim of the research has been to contribute to our understanding of this changing environment in exploring the nature of literacies, learning and technologies and focusing on how these intersect in students' lives as learners, across and at the boundaries of the formal higher education curriculum.

Within the changing climate outlined above, many claims have been made about both student learners and student learning. Maybe most ubiquitous is that rehearsed by Prensky (2001) in his description of today's students as digital natives. He claimed that undergraduate students were very different from their predecessors because of the total immersion in their broader lives

in digital technologies. As a consequence of this activity, Prensky suggested, students no longer process information in ways which are aligned with conventional study. Since Prensky popularised the idea of the digital native, other similar terms have swiftly entered the arena, the 'net generation', 'wiki fledglings', the 'millennials', the 'google generation'. The connotation of these terms is two fold. First, when used somewhat pejoratively, the implication that the engagement in digital technologies in their personal worlds may impair students' ability to engage in serious academic study, and all that implies in terms of, for example, reading books and writing essays. The second relates to arguments being rehearsed by learning technologists that universities need to respond immediately to this new generation of students in aligning their teaching and learning activities with students' digital worlds, for example, harnessing web 2.0 in the curriculum.

In adopting a literacies perspective, this research speaks to both of these perspectives. It is by no means alone in asking questions about the positioning of students in relation to digital technology both in and outside the curriculum. For example, Kennedy et al.,(2008), drawing on a quantitative study of two thousand first year undergraduate students, suggest that the use of technology in students' personal lives was by no means ubiquitous. Others have challenged the simplistic notion of, and claims being made for, students as digital natives. Bennett, Marton and Kervin (2008) undertook a critical review of the evidence for students as digital natives and raised questions about the concomitant argument, that universities need to respond urgently to the 'google' or 'net generation' in introducing technological applications into

their students' study experience. They suggest that the arguments being rehearsed, about the effect such students will have on conventional education, appear to have little empirical or theoretical basis and look more like 'moral panic'. From a literacies perspective, we would argue that the tendency to position students in relation to the use of digital technologies in their broader lives, and any concomitant claims about their inability to participate in conventional academic practices, is akin to a deficit model of student learning and writing, which has been consistently critiqued in the academic literacies literature (cf. Lea & Street 1998). Both Kennedy et al. and Bennett, Marton and Kervin suggest caution with respect to the argument that universities should embrace technological change in relation to teaching and learning merely as a response to this new generation of learners. Both also point to the need for more research in this area. Kennedy et al. suggest that their study would have benefited from in-depth qualitative research on students' experiences of technology and Bennett, Marton and Kervin conclude that there is a lack of empirical research underpinning the claims being made about undergraduate learners. They argue that the picture that is beginning to emerge of students' use of technologies is much more complex than the notion of the digital native would suggest, and that a "more measured and disinterested approach is now required to investigate 'digital natives' and their implications for education." (Bennett, Marton and Kervin, pp 775). Hardy et al. (2009) appear to offer the kind of holistic approach that these authors are calling for. They have explored technologies and the student experience through both quantitative and qualitative methods, with particular attention being paid to the student voice, through the use of audio diaries in order to

complement their surveys. They conclude that universities expanding their use of technology need to “do so with suitable advance preparation of student attitudes, despite the rhetoric of a few Net Gen proponents” (Hardy et al. pp 63).

In the most recent research both Jones and Healing (forthcoming) and Czerniewicz and Brown (forthcoming) suggest a complex scenario with regard to the relationship between technologies and student learning. Both adopt a more sociological perspective in foregrounding, respectively, issues of ‘agency’ and ‘boundaries’. These add weight to the lack of support in the research literature for the characterization of students as digital natives and a call for a more nuanced understanding of their relationship, as learners, to technology. Although the literature provides some rich accounts of students’ use of technology, at present it still stops short of in depth or detailed examination of what students actually do in contexts when they are using these different applications or how meanings are being made from, and through, engagement with digital technologies. As a result we still know very little about the digital texts students encounter, engage in and produce both in association with their studies and in their personal and wider lives. In short, these large scale studies tell us very little about the processes of meaning making for student learners in a digital age. We recognize that in part, at least in the UK, this is a direct consequence of the most common funding mechanisms, for example via the Joint Information Systems Committee (JISC) and the requirement to report quickly with practical recommendations. These priorities make it more difficult for projects to adopt the contested or

exploratory approach which is essential for exploring the learning issues in their entirety. Theoretical, methodological and conceptual issues tend to appear as mere background in reporting of project findings. Although not primarily concerned with student learning in a digital age, Ivanič and colleagues work on literacies in further education (Ivanič et al. 2007) is an excellent example of research which combines its development of theoretical and methodological approaches with practical outcomes (<http://www.lancs.ac.uk/lffe/index.htm> retrieved May 22nd 2009). Based on frameworks offered by literacies research more broadly, the project speaks equally to both researchers and practitioners in exploring the lived experiences of learners in further education and the relationship between literacy practices in their everyday lives and in college.

Issues of methodology

In order to address the limitations of research findings to date in relation to student learning and technologies, we offer a complementary perspective in focusing on digital literacies and the texts which are accessed, negotiated and produced in the learning environments afforded by digital technologies. We draw here upon the theoretical framework offered by academic literacies research, arguing that this body of work has a critical contribution to make to researching student learning in a digital age with its attention to literacies as contextualized social and cultural practice. We suggest that this focus on literacies is particularly generative in debates around learning and technologies for the following reasons. It offers a robust theoretical and methodological frame which has already made a significant contribution to

understanding learning in a range of educational contexts, including those which are digitally mediated. It foregrounds issues of meaning making in textual production in learning environments. This is particularly significant since so much of students' digital engagement involves the reading and production of texts. It provides a framing for asking critical questions about learning and technologies both in and outside the formal curriculum, and where boundaries between these are blurred, since its focus is on textual encounters and their particular significance for those involved. Texts produced in association with digital technologies are hybrid, fluid and multimodal, offering possibilities for the integration of a range of texts in different modes. Axiomatic to this research is a recognition of the central nature of texts, both in the construction of knowledge and the practice of learning, which is still largely absent from e-learning research, to date. (For a fuller discussion see Goodfellow & Lea 2007). In addition the literacies focus foregrounds the importance of the institutional context and the part that universities and colleges play in determining ways of making meaning in a digital age.

The research reported on in this article not only builds on an established international field of enquiry which has been concerned with literacies and learning in higher and further education (Ivanič 1998; Ivanič et al 2007; Lea & Street 1998; Lea & Stierer 2000; Lillis 2001; Thesen & Pletzen 2006; Walton & Archer 2004) but also develops further work in the field which has been concerned with online and e-learning environments. This research has already resulted in examination of, for example, the relationship between the texts of students' online conference discussion and their written assignments

(Goodfellow et al. 2004; Lea 2000; 2001;), argumentation in online learning (Coffin & Hewings 2005), meaning making through the use of hypertext (Mc Kenna 2006) and power, authority and institutional practice in online message postings (Goodfellow 2005; Lea, 2007). These studies provide evidence for the relationship between writing, reading and meaning making in the process of knowledge construction in digitally mediated environments. However, whereas this prior research has focused specifically on digital practices within the university curriculum, the present project is developing these principles further in exploring a range of practices both within and at the boundaries of defined curriculum spaces for learning and assessment. It is exploring the practices of reading and the production and negotiation of digital texts that are involved in the day to day business of being a student and developing methodological principles for exploring the relationship between literacies, learning and technologies.

Although the term digital literacy is now widely used in the broader field of learning technologies, we use the specific term 'digital literacies' as a heuristic, a lens with which to examine what students *do*, in the tradition of literacies research. This contrasts with the use of the term to refer to digital literacy as something students should master; a set of skills which can be identified and taught *to* students. The use of the term 'literacies' in the plural signals a view of literacy as engagement in a range of contextualised social and cultural practices around texts. It also serves to foreground the relationship between written texts and learning from the perspectives of the different participants involved. In so doing it enables us as researchers to pay

particular attention to the broader institutional context of practices around texts and what sense students make of these. A further dimension follows from the fact that literacies in higher education or post-compulsory contexts more broadly are no longer adequately explained by attention to writing and its significance in terms of both learning and assessment, which has been the focus of academic literacies research to date. As researchers in the field it is no longer sufficient to look at written products such as a student essay or feedback on that essay. The boundaries of the texts students are engaged in today are fluid and unstable and, as researchers, this has provided us with many new challenges in terms of both data collection and data analysis (see below).

Questions of method

As indicated above, our methods have been framed against the background of a lack of fine-grained, research of literacies, learning and technologies in higher education. We take an ethnographic perspective (see Greene and Bloome 1997) in line with previous academic literacies research (see Lea & Street 1998; Lillis 2008). In order to address the diverse contexts of today's higher education, the research has been carried out in three very different kinds of institutions offering tertiary level provision in the UK: Northcity, a post-1992 university offering a range of professional degree level programmes; Smalltown, a further education college, offering foundation degree courses in addition to vocational certificates and diplomas; and Centrecity, a prestigious, long-established university offering primarily academic subjects at

undergraduate and post-graduate level. In selecting participants from these three contrasting institutions, the study has attempted to go some way towards representing the broad spectrum of students in higher education. Our participants had very different experiences of being a student. They were studying across a range of subject areas including academic (single subject and interdisciplinary courses), professional and vocational contexts. Consequently they were engaged in different types of course offerings, from vocational courses with a fairly rigidly prescribed and delivered content, through professionally oriented study, to conventional academic disciplines.

Initially, forty-five undergraduates volunteered to be involved in the research. Thirty-four of those students stayed the course of the project, with an evenly balanced gender division across the cohort. We met with each participant three or four times at their institutions over a six month period. At first, this was usually in small groups of three or four but as the project progressed most students came along to talk to us individually. In addition, we carried out a process of 'shadowing' by keeping in close contact via short e mail exchanges and text messages. We observed students, during our meetings with them, using a range of texts and technologies both specifically for their university work and in their lives more broadly. Our intention was to build up a picture of students' literacy practices as they read and wrote, produced and negotiated digital texts, in different contexts and across modes. In addition, we also collected hard copy and electronic examples of a range of students' texts both within and outside the curriculum. A rich data-base has been assembled, consisting of meeting and discussion transcripts, electronic field

notes reflecting on observation of practices, texts from a range of contexts, including social networking sites, web-based curriculum sources, personal development plans (PDP), learning journals, individual and group work. This has provided us with evidence of student engagement with a variety of digital texts and practices, written, visual, multi-modal and web-based.

Meeting with students repeatedly meant that we spent some considerable time in the three institutions. This enabled us to gather rich descriptions of the contexts in which participants spent much of their life as students and to understand more about the attitudes and practices that constituted the different cultures of the institutions. In our ongoing contact with participants we were able to uncover descriptions of the personal and the institutional contexts of their textual engagement. Our data is not only concerned with students' use of a particular form of digital resource but how and why, and for what purposes, they were engaging with this text in any particular context. We have also been able to observe the kinds of texts that students compose in contrasting contexts in the curricular and personal spheres, both where these blur and overlap and where they remain discrete. This has enabled us to uncover instances where the personal practices of the participants do not always align comfortably with institutionally mandated practices (for further discussion see Jones & Lea 2008).

Spheres for meaning making

Although we draw on research methods from academic literacies research, there are significant differences in this project around what counts as data and how we as researchers are implicated in making that decision. Students have stepped us through their processes of working online in accessing texts for their assignments. (See Table 1 for student descriptions of the kinds of literacy practices which constitute our data). These have been the primary focus of our research, rather than the finished text which is handed in for assessment.

Table 1: ‘Examples of student engagement in digital literacies’ HERE

In exploring the processes of meaning making and students’ own journeys through a plethora of web-based and other more conventional resources, we, as researchers, have had to make immediate decisions, in situ, about which screen shots to save, which photographs to take of student work, which texts to keep as records of practice. The resulting wealth of hybrid data across a range of curricula and personal spheres of practice, has led us to examine questions about how we make sense of our data and what kinds of research frame we need to be developing in order to understand these new environments. It points to the need for a research framework for understanding meaning in these contexts, providing new ways of talking about learning, literacies and technologies, and taking account of the integrated nature of textual and technological practice in a digital age. This framework brings together mode, participants and practices, acknowledging that we need to find ways of working across all three domains when we are researching

student learning in a digital age. It is no longer sufficient to put a frame around a text and say “that’s what we are talking about in this interview”, for example, ‘let’s talk about this essay and the feedback on it’.

Figure 1: ‘Spheres for Meaning Making’ [HERE](#)

We suggest that in order to understand more about meaning making we need to take account of mode, participants and practices in an intertextual and connected world, where boundaries around the curriculum are permeable (see Figure 2). Following the work of Kress and Jewitt (2003) in the classroom, Leander & Lewis (2008) argue that, although literacy has always been multimodal, the shift to screen and web-based technologies “requires readers and writers to make meaning laterally across modes” p.56. Similarly, our undergraduates were engaging in a range of modes, integrating written, visual and multimodal texts as part of the process of meaning making. We broaden the notion of ‘participants’, in order to capture the integral relationship between students and their engagement with technological applications. This position is developed from Actor Network Theory (Law 1992). The value of actor network theory for exploring the relationship between literacies and technologies in higher education has already been discussed, in Lea (2004) “ANT can be used to explore practices not just by a focus on the texts and the students’ experience but also by seeing technologies as actants in different contexts and scenarios. Students work with and not through new technologies” p.16. Following from studies in the sociology of knowledge (Latour & Woolgar 1979), Law argues that knowledge always takes on and is embodied in a material

form. In addition, this material form is always part of a 'patterned network' involving "a process of "heterogeneous engineering" in which bits and pieces from the social, the technical, the conceptual and the textual are fitted together" (Law p.2). It is this relationship between the social, the textual and the technological, which we suggest sits at the heart of understanding digital literacies. In exploring learning environments in which technological applications are integral, actor network theory provides an understanding within which the applications and the practices associated with them – in this instance literacy practices – are not distinguished. Consequently, in our spheres for meaning making (see Figure 2) both people and technological applications are located as participants. In Law's terms, they are participants in the same patterned networks. Attention to mode encompasses not only text types - written, verbal or multi-modal - or genres - report, e mail, online chat - but also the mediational means associated with the text in a specific instance or context. Mediational means include not only a range of technologies and applications but also the linguistic and rhetorical resources that students appropriate in order to get things done with texts as part of their studies. The identification of practices takes account of the fact that these are always situated and located in particular institutional or social contexts. We conceptualise mode, participants and practices as overlapping spheres for meaning making, in order to provide a heuristic for exploring digital literacies in particular contexts, without privileging either texts or technologies.

In order to illustrate the interplay between participants, modes and practices in the processes of meaning making we introduce two themes from our research

findings. The first illuminates the relationship between texts, technologies and literacy practices. This is followed by more specific consideration of digital literacies and the institutional context, including some attention to issues of plagiarism. We draw on data from the three different institutions (Pseudonyms are used for both students and their universities). Although this is not a comparative study, the data offer some indication of variation in practice between contexts and illustrate how today's higher education is far reaching, with students accessing very different resources depending on the focus of their studies.

Theme 1: Texts, technologies and literacy practices.

The research findings document a significant shift from more conventional academic literacy practices to student engagement in a wide range of hybrid texts, requiring a sophisticated level of rhetorical complexity in bringing these different texts together, primarily in terms of assessment practices.

Traditionally, academic literacies research has focused on student writing and, in some small measure, the other written texts which inform writing for assessment. Technologies have always been implicated, pens, papers, word processors, but they have rarely been foregrounded in examining the processes of meaning making. The data from this project provide evidence for the intertwining of texts and technologies in the processes of meaning making for these learners. Digital technologies and applications play a significant role for students as they draw upon varied texts in the resources they use for study and assessment. For example, when questioned about their practices around the use of the web in terms of accessing sources for their

assignments, students nearly always began the discussions by naming a specific technological application, such as google, wikipedia, or the university library portal:

I go on wikipedia, probably use that,, it's basically an encyclopedia .. and probably what I wanted to search I'd just put it in there (Andrew, Computing Studies, Smalltown)

.... look at the references that they give you, or Google the subject, then look up on Google Scholar, and then from there, from the journals that you find there, they have references to other journals as well so you can link those into the university ones (Mark, Archaeology, Centrecity)

As they began to discuss in more detail what they actually did with the resource their focus was increasingly upon textual practice explaining the texts they accessed, how they made use of them and the consequences of this for their use in assignments:

I would read this [*referring to web page*] and find out what was of interest, were there any quotes that I wanted to take, or maybe some information? I used this.. I would have cut and pasted it into a Word document which contained all my research. I would have probably added the title of the piece and the date, the actual piece I wanted to use and the web-link and I would contain that in a Word document for later use, and I would have compiled a Word document with lots of cuttings and things from the website or hyperlinks for where I wanted to go if it wasn't possible to cut and paste and that is how I would do it (Catherine, Tourism, Northcity)

Copy from the pageNote the web link and the date and the author....Save into Word....Read it and see what parts you need....Copy and paste and then make it a quote...If you are just using the ideas make notes from the page (Alice, Tourism, Northcity)

Table 1 (see above) illustrates the sheer breadth, diversity and hybridity of the kinds of texts students are working with in and around the curriculum. An example is provided by graphics students at Smalltown, who described how they completed their 'Café Africa' project. This required them to produce two very different texts: a visual coffee shop design, for a competition organized by an external client, and a written report marked by their tutor. The significance of this case as an exemplar of practice is the way in which students explained how they worked across a range of texts, from both hard copy and web-based resources, and incorporated these seamlessly in the completion of two different assessment genres with their own distinct purposes and audiences.

...this piece here, we did Cafe Africa recently. This is the final bit where you sort of show the client we did it for. We'd also hand this in to like the teacher to mark (Kevin,Graphics, Smallcity)

This is like a brief. What we get from the actual client or the tutor. This is actually from a client, so it's a little bit better than just having like a tutor one. While they're giving a little talk to us and going through it, I've just written like notes onto it to remind me of stuff. .. this is stuff that the company sent us which is a layout and ideas for interiors and colour schemes possibly, and detailed schematic almost of the entire shop front, because they wanted us to apply our logo to the shop. I think they might have been e-mailed to George the tutor, and then I think he put them onto the computer and we accessed it. It's a pdf. (Simon,Graphics, Smallcity)

So we went from the briefing to like looking up the different companies. Because it has a charitable link I decided to look at their charitable aims, so I just looked on the internet on coffee, and the different companies like Starbucks, and Costa. (Kevin, Graphics, Smallcity)

This (*referring to a web-page from coffeefacts.com*) is just because we had to write a report..I wanted to find out how many countries there were in Africa, and where coffee was grown in Africa, so I just found it out, and then just basically cut and pasted into Word....so I got the facts in front of

me rather than printing out like the entire information off the web page. (Andrew,Graphics, Smallcity)

We had to have logos, obviously a logo for Café Africa ...so obviously the first place to look is other people's logos for coffee. (Andrew,Graphics, Smallcity)

These (*referring to his own hand drawn logos ,rather than ones downloaded as images from the computer*) are all self-made cos of the importance of that hand-made rough feel that you get from Africa. It's not taken off but inspired from a book I found to do with African sculpture of which there were these tiny little figures carved. I like the look of that and the whole human aspect and the interaction that people have in coffee shops. I thought that was quite appropriate so I went along that lines. (Andrew,Graphics, Smallcity)

In each instance illustrated above both texts and technologies are intertwined.

There is a constant flow and interplay between texts, technologies and practices as students engage in their area of study. Following an actor network perspective, the social, the conceptual, the textual and the technological are articulated in configurations of meaning making in specific learning contexts.

Theme 2: Digital literacies and the institutional context

As discussed previously, one of the major aims of the research was to throw light on anecdotal claims that undergraduates indiscriminately use web-based resources, with little understanding of, or respect for, conventional study practices. The findings indicate how most participants took the guidance given by their tutor as the starting point for their studies, following links on reading lists, lecture notes, power point presentations and supplementing these with

searches using their own chosen applications, usually google and wikipedia.

Lectures were a frequent starting point for writing assignments. Carol talks about making notes on a lecture handout:

Well this is a lecture that we had on Anthropology in North America, and so the guy was starting off saying how people got into North America in the first place, so like from the . . . there's two theories, one's from the Bearing Strait and the other is directly from Europe across westwards, but the Bearing Straits are more likely, so 'yeah' he gave us this as a sort of, just something to have in-front of us while he was talking. Well as you can see like pretty much all my notes from this lecture are on this piece of paperwork, cos I find it really useful to have the image I had during the lecture from the actual notes. (Carol, Anthropology, Centrecity)

The use of powerpoint in lectures was ubiquitous in the data, and many students relied heavily upon these as a basis for their assignments. Many explained about the requirement to download the lecturer's powerpoint from the virtual learning environment prior to the lecture. Yvonne explained how she made notes on the hard copy during the lecture in relation to her next assignment:

Almost every single lecture we have to download it from the Web before the lectures.....I print lots of slides in one page. I print it out and bring it to the lecture and make notes on this piece of paper.

(Yvonne, Economics, Centre City)

When searching for resources for completing assignments, participants described how they were guided primarily by what they thought their tutor would be looking for in their assignment and also by their own concerns about

reliability, validity and authority. Although the data raise questions about the provenance of students' interpretation of reliability and authority in web-based contexts, what is significant is their belief that particular sites are reliable in terms of institutional requirements for assessment:

I use the site Cambridge, I don't think they will put something which is not true. It is most of like, because, you know, my course is Tourism and more of the sites I use are government connected so I don't believe they are untrue. (Imogen, Tourism, Northcity student)

We have just been grouped up for a presentation in 2 weeks about our field trip in Bournemouth.....I would probably use, like, the Bournemouth website, the actual destination website to find information on it, and the Local Authorities websites and stuff like that.... our presentation is about the development of the destination so it is a lot to do about policies and which come from the council and local authority site, so I would need let's say development plans, some sort of strategy, and I would check and probably easily find this in the destination website (Rosemary, Tourism, Northcity)

Although the web is evidently a central resource for students, the data illustrate how their searches are guided by institutional requirements around assessment. Findings also provide insight into the diversity of texts which are being mandated by the institution. Although these vary according to subject and discipline, the validation of commercial and organizational sites is strongly represented in much of the data. One example, offered by students at Northcity, was the use of the British Airways website to access facts and figures and download company reports in order to use and reference in an assignment.

This appropriation of texts external to the university has significant implications for the changing status of knowledge, and what counts as authoritative and legitimate knowledge in today's higher education. The data point to an extensive blurring of conventional boundaries between academic and external knowledge, and this is represented in students' assessment tasks. The research suggests that it is the institution itself, through departmental and individual tutor practices, which is driving these changes rather than any indiscriminate use by students of web-based resources in their assignments. New forms of knowledge are being brought into the academy and validated by the university through departmental and tutor practices.

Discussions around plagiarism

With respect to institutional drivers of textual practice, one of the most significant issues raised without prompting by our participants was that of plagiarism. This was discussed frequently in terms of concerns about the reliability and validity of sources. The mutability of texts results in this being a particularly significant area for students and, almost without exception, participants talked about their concerns around plagiarizing unintentionally. The data also suggest that students' concerns about plagiarism did not appear to stem from any explicit understanding of historical, long standing academic practices around using sources. Although there was clearly variation in what was acceptable practice in different subject areas around using and referencing texts, what was particularly revealing was a general lack of any broader understanding of academic practice. Participants'

descriptions of avoiding plagiarism seemed to have become decoupled from any institutional history. This decoupling is illustrated by some students' attention to surface features of texts, when it comes to avoiding plagiarism. For example, Daniel believes that if he changes the wording of something he has found on the web then he is not plagiarizing but that if he uses a direct quote from the web then he does need to reference the source. Trevor also believes that if he does not use specific words from a site then he is not plagiarizing:

because I don't copy, I normally put in my own words erm the way I see it (plagiarism) , its only copying other people's work or other students or other material from anywhere and just copying... *(Trevor, Computer Studies, Smalltown)*

Others, like John, describe plagiarizing as “pasting something off a website” and are fully aware of the consequences, which students frequently talked about in terms of retribution:

I was aware of it (plagiarism) before, but this time they told you about the consequences, yeah the consequences have gone up and it has sort of stepped up a lot. It is tough, it is cheating in any form, you have to respect copyright, you must always reference, it's easy to make a mistake, you may not mean to do it, you lose marks if you do not reference properly
(John, Business Studies, Smalltown)

The introduction of plagiarism detection software introduces an added dimension to the relationship between texts, technologies and literacy practices. This is illustrated in the following revealing exchange between Mark

and Don, two Centrecity students, in which they discussed what percentage of a submitted assignment was 'allowed' to be plagiarised:

Mark: ... you've got to put through and Turnitin then, to make sure you haven't plagiarised. We've all got an account, and you just sign on with your e-mail, and then the password you use for all the university computers, and then upload it onto there, then it checks through like all the books, everyone else who has put in an essay, it's all stored on there so . . . And then you print that off.

Researcher: Do you do a paper print off as well?

Mark: Yeah, yeah.

Researcher: You do?

Mark: Well that's just when you hand it in sort of thing, not before you have to hand it in, no.

Researcher: So you hand it in and then?

Mark: Well the plagiarism thing's online, so you upload the file from your computer and then 'yeah' sort of check the percentage, because it's usually just the bibliography that is bringing up the percentage.

Researcher: So it means after it's gone up you can actually take it back and do something about it can you?

Mark: Yeah, I mean if you plagiarise then you'll want to change something.

Researcher: So it's you who sees how much the percentage is, it isn't just the tutor.

Mark: Yes, it is for the lecturers as well. Obviously if you've got a 50% plagiarism then there's a problem.

Don: What is the extent to which we're allowed to plagiarise, 17% or something?

Mark: No, it's just like 20%, but I mean that's all with just the bibliography or literally a couple of words which they highlight and you just ignore that, but obviously if you've got a paragraph then . . .

Don: And if you're reproducing the title then . . .

Mark: Yeah, even the title sometimes, but it's not a problem.

For these first year undergraduates, studying a conventional academic course at a highly prestigious research-led university, their concern with regard to plagiarism, as a technical reading of the text and its relationship to other texts stored in the electronic system, shows no broader understanding of why one might want to avoid plagiarism as appropriate academic practice in the construction of disciplinary knowledge, or any wish to explicitly acknowledge those whose ideas and words one is drawing upon. For them, plagiarism has been reduced to a technical issue of percentages of reproduced text. The broader implication concerns the nature of texts, technologies and practices and the implications for meaning making. Students' study practices have always been dominated by the institutional context but what we see in this instance is textual practices, which have historically been informed by particular disciplinary and epistemological roots, being decoupled from these and aligned with new texts and contexts.

Conclusion and implications

In paying attention to digital literacies our intention has been both to develop the field of academic literacies and to make a contribution to e-learning pedagogy which moves us beyond the technologies to understanding mediated textual practice. In so doing, we have explored some issues of meaning making in a digital age, illuminating the relationship between modes, participants and practices. The project has paid particular attention to the judgments that students make which inform their literacy practices in hybrid,

textual and technological spaces, rather than focusing on the written assignment per se.

The research findings provide evidence of students as adept readers in an increasingly complex digital world across different contexts of tertiary education. Our participants were adept at drawing on complex, hybrid, textual genres, using a range of technologies and applications and integrating these into both their assessed and un-assessed work. Arguably, this is a far more complex task than that which was required of students before the era of digital technologies permeated both the curricular and personal spheres of textual practice. In addition, students' accounts of working with multiple sources also illustrate the dominance of reading in a digital world; in many ways, bringing reading - in contrast to writing - to the fore in students' literacy practices. Reading is integral to the choices that students make around the textual resources available to them for use in their studies and to the integration of this diversity of textual knowledge into their assignments. We have clearly moved a long way from the days when students accessed the library for key texts which would form the basis of their essay writing. Despite this hybridity, what remains constant is students' reliance on the authority of the institution, which goes well beyond course reading lists to embrace a range of online resources, such as power point slides, lecture notes accessed via the VLE, e-mails from tutors, relevant websites and commercial documents and reports.

At Smalltown the range of literacy practices encountered included a commercial, computer networking course, where students followed the course

step by step online with their tutor in the classroom. At Centrecity, anthropology and archaeology students accessed and read journal articles, written for academics in the field. At Northcity, students integrated their reading of articles from the 'Annals of Tourism Research', with information gleaned from company reports. The sheer breadth of texts and practices which these undergraduates were engaging with was unprecedented. What also emerges from the data is the changing status of knowledge and the way in which diverse texts are being brought into the academy and valorized for students through particular forms of textual practice. We see the integration of a range of texts, including business and commercial genres as particularly significant in what counts as knowledge. Although one can imagine a context in which such documents were offered to students in hard copy before the widespread use of online and web-based resources, the constraints of making available or photocopying extensive texts would have made such a practice unlikely. Now students can download, for example, reports and strategy documents from commercial and other external sites, at the click of a mouse, and integrate these into their assignments with ease. New forms of knowledge are being validated through departments and tutors, as Mode 2 knowledge, (Gibbons et al.1994), created outside the academy, is now being brought back into the university and used alongside Mode 1 knowledge, which is codified in scholarly publications. These digital texts are all resources to be drawn on through an integration of the social, conceptual, textual and technological in the processes of meaning making.

In addition to documenting the diversity and hybridity of undergraduate textual and technological practice, the study provides evidence for the changing nature and status of different forms of textual knowledge in higher education. This does not appear to be related to any desires of students to bring their own networked social worlds into the academy. Indeed, when asked specifically at the end of the final project meetings about the potential of harnessing such technological applications within the curriculum, participants indicated resistance to such intrusion and were less than enthusiastic about these possibilities. They were evidently bringing their experiences of using a range of technological applications into the way in which they approached accessing resources for their university work. However, when it comes to exploring textual practice and its relationship to new forms of knowledge, the project findings suggest that it is the institutions, themselves, which largely determine what counts, with students' approaches being dominated by the rules and requirements of specific assessment procedures and practices.

There are significant implications for lecturers in understanding the complexity and diversity of literacy practices with which students engage. The study suggests a need to redefine what is meant by literacy in the university, paying much more attention to the mutability of digital texts, and more specifically, the ways in which students are accessing, reading and integrating these into their study and assessed work. This includes paying more detailed attention to the situated and contextual ways in which students make sense of the range of genres they encounter and how they integrate these into their assignments. In this respect, there is likely to be a significant disjuncture

between present day approaches to supporting student writers and the digital textual environments within which students are immersed in prior to submitting their work. Although the research provides evidence that institutions themselves are strongly implicated in students' digital literacy practices, for the most part departments and tutors remain largely concerned with the final text, the submitted assignment. It is timely for institutions to shift this attention to the new textual landscape and its significance in understanding supporting student learning and assessment in a digital age.

The project has focused specifically on digital literacy practices, rather than foregrounding particular technologies, for example, the use of web 2.0 applications in and around the curriculum. In a fast moving technological world, applications being heralded by learning technologists in higher education are constantly being overtaken by new ones. Although the importance of textual practice is all too frequently overlooked, it is at the heart of present day developments, where technologies are being harnessed in the service of learning. As applications such as blogs, wikis, e-portfolios are, inevitably, superseded, the approach taken in this project, with its focus on both textual and technological practice, and attention to meaning making in terms of participants, modes and mediational means, offers a critical methodology with which to explore future environments for learning. This should stand as a valuable heuristic despite the relentless developments of new technological applications and the emergence of new texts in the academy.

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