Creating time: students, technologies and temporal practices in higher education

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Abstract

The nature of time has been considered in some depth within philosophy and social theory, while theoreticians have also explored interrelationships between temporality, artefacts and social process. However, the notion of time in mainstream educational theory and research has arguably been regarded as fixed, naturalised, undifferentiated 'context', and has tended to escape examination or problematisation in the learning technology literature. However, as the contemporary university becomes increasingly permeated by digital mediation both online and 'face-to-face', relationships between digital media, time and socially-situated practices of meaning-making are foregrounded. This paper will report on a UK-based research project which investigated postgraduate students' day-to-day engagements with technologies, drawing on a combination of qualitative focus group, interview and multimodal journalling. The data suggest that for these students the dimension of time is in complex, dynamic and contingent interplay with a range of networked devices, and shifting material domains and practices which are mobilised for textual engagement and production. It will argue that student entanglements with devices and digitally-mediated texts serve to pause, distribute, elongate and render simultaneous the temporal nature of their practices in emergent 'temporal practices' in complex relationships of co-agency with devices and technologies. It will conclude that a typological analysis is inadequate to understanding of these complex, emergent engagements.

Introduction

> 'Time is neither fully 'present', a thing in itself, not is it a pure abstraction, a metaphysical assumption that can be ignored in everyday practice. It cannot be viewed directly, nor can it be eliminated from pragmatic consideration. It is a kind of evanescence that appears only at those moments when we are jarred out of our immersion in its continuity, when something untimely disrupts our expectations' (Grosz 2004: 5).

The particular nature of time as part of social process generally, and of educational process specifically, is subtle and resistant to easy analysis. As Grosz points out, time cannot be considered as an embodied 'thing in itself', but it cannot be considered in entirely abstract terms either. The constitutive role of time and timekeeping in the development of contemporary society has been recognised (e.g. Landes 2000), and through this type of historical analysis, the central social importance of time and how it is conceived of to society has become apparent. The social nature of time has also been explored by Adam, (e.g. 1995, 2004, 2006), who in a series of influential works explores how conceptions of time are embedded in cultural practices. Time has also been extensively investigated in philosophy, with a focus on themes such as time and conscious experience (e.g. McInerny 1992), and feminist and postmodern perspectives on time (e.g. Grosz 1999, 2005). These disparate explorations of time perhaps share one common feature: a recognition that time and how it is conceived of is a crucial constitutive dimension of human life, rather than a neutral and unchanging backdrop against which action takes place.

Theoreticians have also investigated the interrelationships between temporality, social process and technologies in particular. Borgmann (1984) interrogates what he calls the 'device paradigm', which he sees as the increased prevalence on goods being made available in a fast, non-burdensome way which obscures and 'blackboxes' the processes by which they are made. Simpson (1995) similarly argues that technology represents an attempt to domesticate time, to resist the idea of finitude, and claims that technologies drives us towards a focus on results which is ultimately alienating. Kendall and Michael (2001) also explore time, technology and the self with reference to what they see as the tacit models of temporality developed by Foucault (e.g. 1986) and Latour (e.g. 1993).

However, despite this range of theoretical perspectives in social theory and philosophy (a fuller exploration of which is beyond the scope of this paper), in the mainstream of research into learning technologies the notion of time has arguably tended to be seen primarily as part of what is assumed to be stable and separate 'context'. For this reason it has tended to escape close examination or problematisation. However, the contemporary university is now characterised by an almost complete permeation of digital mediation in terms of process both online and 'face-to-face'. This exponential increase in digitally-mediated educational practices has served to foreground discussions surrounding the relationship between digital media and socially-situated practices of knowledge construction and meaning-making, as the relationship between media, epistemology and time becomes salient, problematic and unstable. Complex interconnections between multimodal semiotic practice and space have already been noted in the literature (e.g. Kress and van Leeuwen 1996). However, the co-constitutive nature of the relationships between educational practice, digital mediation and temporality have received little attention in the literature,

(exceptions include Lindley 2005), despite the powerful influence that technologies of inscription have on the formation and maintenance of social processes surrounding text production more broadly (e.g. Kittler 1992).

This paper will report on findings from a UK-based two-year funded research project (JISC 2012) investigating the day-to-day engagements of postgraduate students with technologies, drawing on a combination of qualitative focus group, interview and student-generated multimodal journalling data composed of images and video. The data suggest that for these students the dimension of time is in complex, dynamic and contingent interplay, involving emergent co-creation of practice in conjunction with a range of networked devices, shifting material domains and practices mobilised for textual engagement and production. Drawing on Horning et al (1999) in the analysis, it will argue that student entanglements with devices and digitally-mediated texts serve to pause, distribute, elongate and render simultaneous the temporal nature of their practices in complex ways which defy typological analysis.

Conceptions of time and technologies

This section will focus on conceptual framings of the relationships between time and technologies in particular, drawing on papers which seek to interrogate taken-for-granted notions of how agency might be distributed between 'the user' and technological devices, in order to generate 'practices of time'.

Lemke (2000) in a theoretical piece, points out how in the contemporary urban environment '…physical proximity may have little to do with probability or intensity of interaction' (2000: 274), highlighting what he sees as a central weakness of a purely 'spatial' view of complex

ecosocial systems, proposing instead a view of that system as a set of interdependent processes. Crucially, he argues that networks of semiotic artefacts such as books act as 'boundary objects', which enable coordination between processes on radically different timescales' (2000: 275). As he puts it:

> 'The notebook, as a material object with semiotic affordances, as a thing that can also be a sign, materially links two events across time and space and so participates in a process on a much longer timescale than either the event of writing or the event of reading that particular note. And in this case so also does the student. At another juncture, the teacher reads aloud from the textbook, writes on the board, and asks a question that would not have been written or asked as it was without the influence of the textbook's words. Those words, the generic discourse pattern or discourse formation inscribed in the material object of the textbook, have an even longer (cultural) history than does the particular material book or the unique wording of its text. Not only the processes and activities that produced the textbook, but also the processes and activities that produced that standard discourse pattern about chemical reactions and circulated it long ago to the textbook's authors and editors, are now intersecting through the mediation of the book as a material-semiotic object with the much shorter-term events in the classroom episode.' (Lemke 2000: 281)

Lemke is emphasising here the agentive nature of these 'material semiotic objects', which contribute to / co-produce the temporal nature of educational process.

In their related analysis of technologies and time, Horning et al (1999) argue that time is not just a category of mind, a cognitive device or a symbol, instead advocating the Heideggerian (1962/1977) notion that:

> '...time is part of our physical involvement with the natural and technological world; our practical daily involvement with the material world is temporal to its core. Time is then more than a socially constructed category that allows us to move through the world in a coordinated and meaningful fashion. Instead human beings establish peculiar temporal relations with the world; they are locked into the material and technological words that they create.' (Horning et al 1999: 294)

In their view, neither technological determinism nor social constructivism helps us to understand the relationship between technological and social worlds. Drawing on Latour (1994), like Lemke they argue instead that there is a need to grasp the mediating role of technical artefacts in order to understand this relationship more clearly:

> 'Practical life is a continual blend of routine and thought. New knowledge and new technologies permanently open up new strands of involvement with the world. Then the already learnt skills and competences to enact and 'entime' the world become inappropriate and are confronted with the contingencies of new knowledge and recent technology.' (1999: 297)

With specific reference to time, they pose the following questions:

> '... which role do technologies play in 'entiming' social action? Do technologies have time? Are they time-loaded? Are there time regimes embodied in technology? Are there temporal norms built into technical artefacts that not only determine the technology itself but also affect the daily uses of the artefact? Or, as we like to ask: how do the temporalities of technology relate to the various temporalities embodied in different social practices?' (Horning et al 1999: 294)

In an interview study, they looked at time practices used with three technologies which were cutting edge at the time of writing in the late 1990s: the PC, the video and the answering machine, and identified three patterns of engagement among the participants: what they termed the *surfer*, the *sceptic* and the *gambler*. The *surfer* is characterised as being positive in orientation towards technologies, using them in an instrumental way in order to increase efficiency and to save time. The emphasis here is on accelerated pace, and the urge to 'keep abreast of time' (Horning et al 1999: 297). Time is conceptualised here as a scarce quantitative resource, which must be managed systematically in order to 'proactively secure the future' (loc cit). In contrast, the figure of the *sceptic* is seen as placing value on face-to-face communication over the technologically-mediated, is suspicious of technologies, and prefers print technologies over the digital. Time for the sceptic must be

used above all meaningfully, as opposed to efficiently. The third figure identified by Horning et al is that of the *gambler*, who '…aims to generate time margins in which temporal references can be kept variable and combined in new ways' (Horning et al 1999: 300). The gambler's practices are characterised by flexibility and adaptability.

This analysis is highly relevant to this present study, as it represents a rare qualitative empirical study investigating individuals' responses to technologies with a focus on time. However, one weakness of the paper is that the authors do not present quotes from the interviews and provide little context, leading to a rather un-nuanced impression of the data. Additionally, although the authors emphasise that the orientations of the three 'figures' may be present in one individual at different times, the typological categories still suggest a somewhat fixed orientation to technologies in the individual.

This paper seeks to pick up and address their question of 'which role do technologies play in 'entiming' social action?' in the contemporary educational setting, looking at student uses of a range of mobile and fixed networked devices for their studies.

The study

This section will describe a study funded by the UK government Joint Information Services Committee (JISC), as part of the sector-wide 'Developing Digital Literacies' programme. The study was conducted at a predominantly postgraduate Education Institute in the UK. The Institute has a large body of doctoral students, teaches a range of Masters programmes and education and also offers initial teacher education at primary and secondary level. The majority of the students attend face-to-face, but a small number of students engage as distance learners. The project set out to investigate student engagements with technologies

in their studies, motivated by a desire to provide better support and to develop student 'digital literacies' across the institution, but also in response to the relative lack of in-depth qualitative research into this area.

Institutional ethical approval was granted for the data collection, with confidentiality and anonymity guaranteed for participants, the project conforming to the ethical guidelines required by the British Educational Research Association (BERA 2011), and to the requirements of the UK Data Protection Act (1998). The research took place over one year with the data collection methodology spanning two phases: focus groups and longitudinal multimodal journaling. The focus group approach was chosen as it facilitated discussion of the experiences of students on different types of course and pursuing contrasting modes and levels of study. Multimodal image-based journaling using handheld iPod Touch devices was selected as a second method of data collection, as it provided an opportunity to gain insights into the students' engagements with technologies over time, based on day-to-day practice as opposed to data at a more abstracted level, such as that generated by traditional interviews. The participants were asked to generate and also analyse their own data to some extent via a process of assemblage and the identification of themes. This form of journaling was also chosen to avoid a reliance on textual mediation, which often leads to generalisation away from the material – instead the focus was explicitly on the visual, with a focus on objects and embodied material practices, drawing on visual methodologies (e.g. Pink 2006).

Student focus group volunteers were accessed by the Students' Union (with a small voucher incentive offered), and four focus groups were held corresponding with the four groups of students identified above (the distance learners' focus group was administered using the

synchronous classroom software Elluminate, which the students already used in their programme of study). In terms of positionality, the researchers were not engaged with the students in any other capacity, with the exception of the distance group facilitator who had done some teaching on their course, but did not have responsibility for assessment, would not be teaching them again and could not influence their course progress. The focus groups were semi-structured, and focused on participants' engagements with technologies as part of their studies. Participants were asked to draw maps (an example of which can be seen in figure 1), pictures or diagrams to represent this, which then fed into the group discussion. Emergent themes were identified via close reading of the transcripts, with a range of differences between the groups emerging in the data.
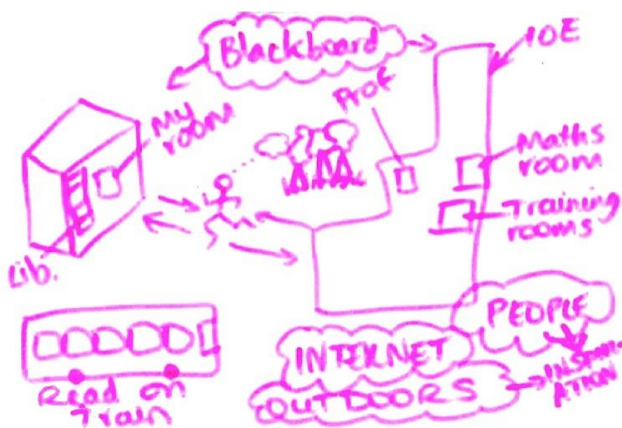

Figure 1: Map from PhD Focus Group

The focus group volunteers were also asked to participate in a second phase of the data collection, consisting of a six-nine month period of multimodal journaling around the theme of engagement with technologies. 12 students volunteers were chosen to reflect a representative spread across the four groups, genders, nationalities, ethnicities, and age group (participants were all in their 30s and 40s). The volunteers were given hand-held iPod Touch devices, which were used to document their experiences and practices, using a

combination of photos, videos, and notes. Participants were offered the device as an incentive, to be retained on completion the full project. Three or four interviews were held with each participant throughout the data collection period, with the interviews structured thematically around the images, videos and notes created by the students, or focusing on presentations created by the students using Prezi or PowerPoint. The final interviews focused on engagements with particular texts, and how technologies and devices had been deployed in the various processes or searching, reading, notetaking and writing. The interviews were transcribed and analysed using close reading for themes. The following section will focus on aspects of the students' accounts which relate to time in particular, followed by a discussion linking these findings with the literature and theory discussed in the first section.

Findings

In the focus groups and interviews, seven themes were identified in relation to temporal practices. These were *slowness, overload*, *keeping up, intrusive technologies*, *technological/embodied action, making future time*, and *constant entanglements*. This section will describe these, illustrated with quotes from the data.

Slowness

This theme groups together comments relating to technologies which were reported to have had an effect on student practice due to being either too slow or intermittent. There were numerous comments about slow login or processing speeds having an effect on practices:

Like, before you get on the internet or on the computer, you have to wait, like, ten minutes before it's starting up... And then if you go on the internet, the internet at the IOE is also not that great because sometimes, like, oh, it crashed and you have to wait again and then you have to log in again. (Masters focus group)

In some cases, students described how the length of time required for a task would cause them to abandon pursuing it digitally, and revert to non-digital practices. Here Juan describes his engagement with the library databases:

So they listed journals but they didn't list internal articles in the journals, so even if they were accessible online, you didn't know. That was... that was something that really slowed down the process and did, sort of, make you think well, I might as well go and sift through them by hand rather than do it by... so I think that was a big one. (Juan Interview 1)

Sally decided to handwrite notes and photograph them for her journalling, as opposed to installing a notetaking app on her iPod Touch:

So this is an email from Evernote... So I was, like, look. So I started writing on a piece of paper and photographing it instead. So basically this is me saying that it hasn't worked. The iCloud control panel would not install and Evernote wanted another login blah, blah, blah. So you see I'm writing it and taking photos (Sally Interview 2)

Juan also describes how he is liable to give up on a piece of software if it takes too long to work out how to use it:

I assume I will be able to do something, and then if it takes longer than five minutes, I then dismiss it as rubbish. So rather than give it the six or seven minutes that it requires just to figure out how to do it once well...(Juan Interview 2)

He also described how on an online module, he and his classmates rejected the institutional VLE as they found it too slow:

> And that was quite interesting, because we were supposed to organise through Blackboard, we were supposed to organise our group and, you know, send each other documents and that kind of thing; we stopped Blackboard and we started using Google because it was easier, quicker and, again, you could… it kept all of our documents…(Juan Interview 2)

Another form of 'slowness' was expressed in relation to print technologies versus electronic – with a PhD student commenting that books were 'outdated' as they take longer to become available:

> …the thing about books is they tend to be out of date because they... a library doesn't tend to get them for like a year after they're published and then, you know what I mean, it's just like quite often they're not the most up to date. You know, I remember like a classic work and [unclear] you look at a book that was a collection of articles on a subject. But I just don't, don't read them as much now, not really (PhD focus group)

A further issue related to technologies being unreliable or intermittent, and the effect that had on practice. Yuki explains here why she doesn't use ebooks:

> I don't like, yes, I don't like e-books because sometimes I can't access because my, as I mentioned, Wi-Fi access in my room was very poor so sometimes suddenly it was disconnected so I cannot go to… move to the next page. (Yuki Interview 2)

The student accounts display a range of reactions to slowness in technologies, which caused them to make adaptations to their practices, activities and focus in their studies.

Overload

Another theme arising from the data was that of *overload* or excess which lead to a slowing down or stopping: particularly texts, messages or information, which had an effect on practices. Sally talks here about her experience of searching for literature in the 'bottomless pit' of online databases:

> It becomes a bottomless pit and it's very un-motivating to not know whether you've done something or not, you know, I'm finding that one of the real challenges of my PhD, is that you just don't know whether you've done your work or not, you don't know, you never get to the bottom of anything, you just go round and round in circles and you never really know whether you've done it or not. (Sally Interview 3)

She also refers to the length of texts:

> ...it's, like, click on the PDF, it could be one page or it could be 1000 pages ...you just constantly feeling like, you click on something, and then you just think, oh God, I haven't got time to read that and then you close it again, you constantly just sort of thinking, oh God, you know, all the time., so it's just an overload of information I think really. (Sally Interview 3)

With the distance students, filtering strategies were reported to be needed to deal with the high number of discussion posts on the VLE. Some students reported scanning their emails as and when they come in and respond through the VLE approximately once a day:

> With the forums, I think I would have found that very difficult to track posting because when we're meant to be looking at all the different conversations and participating, I would have found that too time-consuming to trawl through... Obviously you get the e-mail alerts from any forums that you're involved in and so I just, you know, check those occasionally and look at all the stuff that's coming in and make a mental note and then just go in maybe once a day and reply to the ones that relate to me rather than having to search around the forums themselves. So, that's how I've handled it but I just kind of did that as my own system' (Distance focus group)

The theme of overload (like slowness) seems to have lead to a sense of wasted time, impatience, frustration and loss of motivation. The range of strategies used by the students to respond included disengagement from digital practices, the development of workarounds using technologies, and various screening strategies.

Keeping up

The third theme relates to the comments centred on *keeping up* with technologies.

Although processing speed was seen as a positive attribute of technologies, there was a perception among some students of having being 'left behind' by the fast-moving nature of new technologies and new versions of programmes:

> I felt a bit frustrated...'cause I'm studying here four years ago and I used to use a different version of EndNote. So I was trying to use it the same way now, the new version, and it wasn't working. And I was like why isn't it working, so I felt a bit frustrated because something that used to work in a way now seems to work completely different. (PhD focus group)

> When I used Excel the first time, that must have been about 1999. And then the next time I used it was 2010/11, and I thought, you know, it can't have changed that much, I mean, Word still works pretty much the same and it's only changed colour, so it should work, and I was pretty much lost (Frederick Interview 1)

Sally expresses general anxiety about the difficulty of staying 'up-to-date':

> I don't feel I'm kind of like I'm really up to date with computers compared to a lot of people, but I feel like you just have to keep moving otherwise you will get left behind, and then people kind of say, oh, you know, the poor old thing, she doesn't know... It's just like you can't afford for that to happen, obviously, can't have people snapping at your heels in terms of jobs and stuff without (Sally Interview 1)

Juan describes having been out of education for several years, and also the nature of his previous subject, which he characterises as not being particularly engaged with technologies:

> It was about a seven year gap as well, so there is a big difference and history is not one of those... I don't think it's a subject necessarily where there is that much - I don't know, maybe there is now - but where there's so much online anyway, that, you know, it's quite.. it's a bit of an archaic subject and that, sort of, goes in with the nature of it (Juan Interview 1)

The student responses to the fast pace of change in technologies were varied, with efforts being made in some areas but also decisions being taken to not keep up in other areas which were seen as less of a priority.

Intrusive technologies

A number of comments related to the sense of technology being ubiquitous and simultaneous with other activities in a way which participants found *intrusive*. A Masters student remarks on the expectation that responses should be instantaneous:

> I feel as though we've become a society that wants everything now, instantaneously. You need to be replying immediately. Not everybody's able to do that and not everybody wants to do that. And what happened to the once-upon-a-time, you know, you check your email or we didn't even have email, you know, it was a message in your pigeonhole, you know. And now you're bombarded at seven o'clock in the morning. You walk in, you're, like, what? I've got 100 emails in my, in my, you know, box to go through. And, you know, that can take up a lot of time. (Masters Focus Group)

Sally refers to pressure to join Facebook, referring to what she sees as its 'big brother aspect'. She also expresses her feelings of being watched by Google, and worries around security with her laptop and mobile phone:

> I was like bullied into it by people saying, oh, you'll be left behind if you don't use Facebook. So yes, that was when I got into it, so... And then... so now I would say Facebook, I'm not the most... like I said to you in the focus group, I'm a bit uncomfortable about the whole kind of like Big Brother aspect... (Sally Interview 1)

> I feel like, also that Google is equally watching you. You know, they're all watching you, they're all trying to sell you things, and the thing is not, I don't so much mind being bombarded with advertising as I mind having things put about me on things like Facebook that I don't want. You know, I don't want my friends to spy on me, I don't want my friends to know what I listen to on YouTube. (Sally Interview 1)

Django reports a sense of being 'plugged in all the time' and the concurrent sense of surveillance on the VLE:

> So I just simply have to be plugged in all the time. But I never started that way, on a Moodle thing, or being online, where, you know, one, everybody sees your

conversations, and so I'm finding I'm being really careful about what I'm writing on there, and I don't feel it's a natural conversation then because the, the tutors are always watching and listening. So I can see the point that, one, yes, they can… You know, it's an open forum of discussion, but in the other way, that this whole kind of voyeuristic thing with it I find quite frightening. (Django Interview 1)

Louise also refers to the expectation of instant replies generated by email and mobile

networked devices:

> And I know of teachers who, sort of, can check their emails any hour… minute of the day, because they've got their iPhone on them and stuff. I mean, I think it has slightly created this culture of everybody expects if they send you an email you will get… reply in two minutes… I think that's, kind of, the danger of… that lie in all these mobile devices and stuff. (Louise Interview 4)

Frederick describes how he switches off Facebook in order to concentrate on his work:

> If I'm working at the computer, because I'm doing my literature review at the moment, so I'll be reading a document, and then sometimes, you know, I might be open for someone to contact me if they want to. Sometimes it gets out of hand and too many people will want to tell me something on Facebook while I'm reading, and then I just, you know, I can't do the task, and then I say, right, my PhD does have some priority, and I'll just say, sorry, I'll have to go offline with Facebook and I turn Facebook off completely. (Frederick Interview 1)

Louise refers to the 'temptation' of email while working, which leads her to use a paper

notebook instead. She also talks about her general preference for handwriting:

> And also, of course, it's, like, when I'm at a computer I'm constantly tempted to, kind of, check my email again unnecessarily and stuff. But when you're in front of a, kind of, notebook, there's not that temptation. (Louise Interview 4)

> If I'm writing an essay or an extended piece of work, if I'm sitting at a computer typing, I find that really sort of blocks my thoughts because there's too much temptation to kind of delete and keep on changing. Whereas if you write by hand, you know, it just sort of flows more. (Louise Interview 1)

The theme of *intrusiveness* seemed to generate anxiety, fear and worry among the participants. The responses to perceived intrusiveness include avoidance or deliberate restriction in their use of particular technologies, and protective strategies of various kinds.

Technological/embodied action

This theme refers to various practices reported by the participants, in which technologies appeared to play a major role in the sequencing and focus of their embodied practices. Several comments reflected how participants use online engagement to plan and sequence subsequent action:

> I never go there (to the library) before I've searched everything online in terms of books and whatever I'm going to get there. I don't go there without having an idea already of what I'm going to get, so I search on their online catalogue first and get, um, every single booklet and everything before I go there (PhD focus group)

Louise describes how the interactive whiteboard has changed her teaching as embodied process:

> It's one of those things that I feel that now I don't know how I can possibly manage without. I mean it's totally transformed the way I teach because it is, you know, before in my previous school I had to have a sort of written sheet with each activity I wanted to do, and what order, and almost a kind of script of what I wanted to say. Now, I just have a set of slides up on the board that I move through and I don't forget to do things because I put it up on the board and yes, I really can't imagine now doing it without that (Louise Interview 3)

Juan describes how an online quiz structured his expectations and engagement with subsequent face-to-face lectures:

> There was a little, sort of, online quiz that you had to do through the thing as well, and again it was the same every week, so you knew exactly what it was going to be, and you had to have done the readings before, you know, so it all slotted together. And you had to do it before you went to the lecture. So that was very clear and I suppose it took you through and it took you, sort of, in the way that they… they weren't hand holding or anything like that, but they, sort of, took you through in a

very… in a clear and simple way, so you didn't have to, sort of, worry about that side of it, about getting articles, you could just focus on the issues, you know, the content that you're talking about. (Juan Interview 1)

A further structuring function of technologies was how their features or availability had an effect on the timing of activities through the day and night:

> … they advise us to use Skype just for the, the chatting bit. […] Not the video bit 'cause that slows it down. And usually it kicks it out after a few minutes if you try. […] it only works right deep at night when no one else is online. That's the best time to do research is between 12 and five in the morning. (PhD focus group)

> I've had this problem with Twitter which is time, 'cause usually you follow world time so I, if I go to Twitter during night time it's likely to find your organisation is from the US, same thing. So it, because I don't, there are so many people and so many things to follow, sometimes it's hard to keep track, so if you're not there in the space of time where they posted something, you miss it. (PhD focus group)

Yuki alludes to how the reliability of wifi at different times of day causes her to structure her practices in temporal terms:

> Average day, 90% I write in my room from the morning, because Wi-Fi access is very poor in my room, except for early in the morning. (Yuki Interview 1)

The need for technologies to be deployed in order to make subsequent action take place is alluded to by Juan:

> I mean, I also realise that after having worked and you realise that, you know, if somebody says something to you, that's great, send me an email. It doesn't matter if we've agreed on it, I still need the email otherwise we're all going to forget. So it's sort of… that's the way things might move on now (Juan Interview 1)

Bokeh refers to the recorded nature of the interactions on the VLE as a means of structuring his thought:

> I think in a way (the VLE) is very good for linear work. You write something and people come back to you, and you go away and you think about it, you think about what they say, and then you re-construct. And that kind of a process is actually very good at having an initial fuzzy idea, and then kind of chiseling away and making it a lot more kind of concrete and definite. (Bokeh Interview 1)

This theme reveals the ways in which technologies interact with the students' focus and sequence of action, including in settings which are prototypically seen as 'face-to-face' and therefore not technologically-mediated, such as the physical library.

Making future time

Another theme was identified in which several students described deploying recording technologies in embodied encounters, in a process of pausing or retaining aspects of embodied practice for later engagement, which can be conceptualised as *making future time*.

Yuki describes making sound recordings of her face-to-face lectures:

> For example when I attend a lecture or a session I always record the session, and it's after the session, but sometimes I listen to the lecture again to confirm my knowledge or reflect the session...when I, for example we're writing an essay and I have to...confirm what the lecturer said, I could confirm with the recording data. (Yuki Interview 1)

Juan talks about his practices surrounding literature searches online, and his struggles to save his searches:

> I have articles and after a day or an hour of whatever searching and I've got ten of these and I haven't read them because I haven't got time, what do I do with that? And, again, what I would usually do is save either the documents or, if they're documents and they're PDFs that can save, I'll probably put them on a USB drive. If it's just a, sort of, link, a website or something, I'll email it to myself - so I'll send, you know, a list of ten and email them to myself. The problem is then the next day I'll come in and I'll open up some of them and I'll try and remember what, kind of,

thread I was working off before and, invariably, just start a new one. (Juan Interview 3)

Django has a background in Art, and describes how she digitally recorded her embodied creative practices and spaces in order to make them 'into something else':

> So, in my MA I recorded … I recorded my own hands actually constructing and making something, and it was, I mean it went on for ages, but that was the whole point of this kind of, quite laborious process that I was undertaking in making these things. And then it was, sort of, you know, editing them, using the software to develop some kind of, sort of, narrative that was going through this thing. Using, sort of, Moving Image then… Actually, this is going into making things, but… so filming spaces, taking kind of, freeze-frames of various parts of this journey, and then, you know, making them into something else. (Django Interview 1)

What seems to unite these comments is the students' deployment of technologies to save an aspect of embodied or digital practice which would normally be ephemeral, in order to re-engage with it at a later time, possibly repeatedly. In this sense, they use technologies to in a sense 'make' experiences in their future.

Constant entanglements

The final theme related to time identified in the data was that of *constant entanglements* with devices. Some student comments suggested a strong degree of constant copresence and intimacy with mobile networked devices in particular:

> '…well, the same as everybody; my mobile is, is, um, has to be next to me or beside to wake up to, to it remind me of appointments or anything I need to do on the day. So, yeah, my mobile is definitely number one in technology'. (Masters focus group)

> Actually, when I, except for the sleep, I'm sleeping, I usually always touching my laptop. (Yuki Interview 1)

Yuki produced an image of her iPad on the edge of the bath (figure 2), which she used to

illustrate her engagement with technologies across a wide range of embodied practices in

her home:

> Yes, and in the… on the bed, I had to stay in bed for this... for several days so I read… mainly use iPad to read materials in the bath and on the bed. (Yuki 2 with pic)
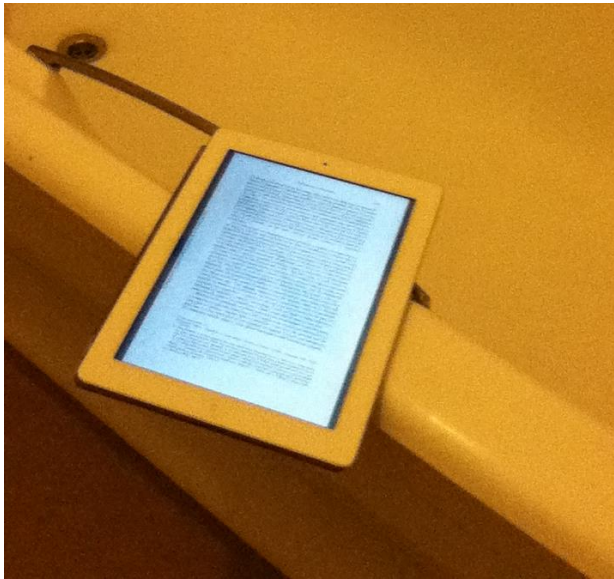

Figure 2: Yuki's image of her iPad, interview 2

Django also remarks on the effect of the ubiquity of her iPad:

> I think it's how much I use laptops and iPads during my supervision meetings. And it only occurred to me when we were just putting a little thing together, I thought gosh, I do, but I can't really... that's really interesting how much I use the iPad for a start everywhere and anywhere...And I have the information there all the time constantly, and I just feel as though I don't have to be anywhere physical at all anymore... (Django 3)

Django also explicitly refers to the notion of simultaneity in her academic work, in her

explanation of a section of her Prezi shown in figure 3:

> That's production of the academic… research, data collection, data analysis, presentation prompt for discussion and organisation data, so all the things that can be done. But I think that you don't realise until you actually try to note down how

complex it is using all of… you know, that we don't just use one application at one time, that it's all, kind of, symbiotic, it's simultaneity that's taking place. (Django 3)
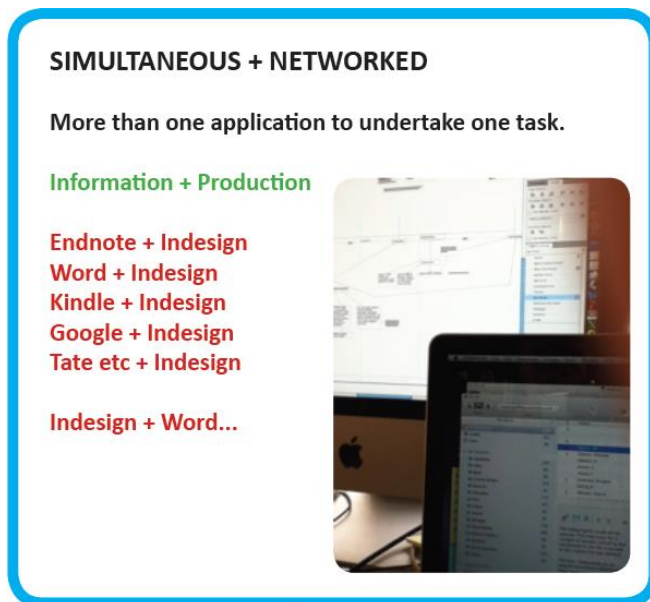

Figure 3: Detail of Django's Prezi, Interview 3

These remarks point to a tendency in some of the participants to be very constantly engaged in various ways with devices, creating a sense of continuous copresence, companionship and practice generated between human and machine stretching throughout their waking hours in some cases.

Discussion and conclusions

The seven themes identified as relating to time in the data suggest a complex picture of engagements, orientations, reactions and strategies on the part of these students. What is immediately striking is that - although each student has particular preoccupations and tendencies - all students report a range of different types of engagement with technologies, across a range of themes. Each individual deployed a range of strategies, showing a mixture

of features corresponding Horning et al's (1999) description of the technophile *surfer* and

the 'Luddite' *sceptic*, depending on the situation they were facing. Their figure of the

gambler remains relevant though, which they describe as follows:

> 'The gambler leads a kind of vagabond life within the highly dynamic sphere of meaningful communication and in this is substantially supported by the possibilities of modern information technology…. We are no longer disciplined by the modus operandi 'built into' technology, but we write our own user script and even arrange for periods in which we take the conscious decision to abstain from its use' (1999: 301).

This highly adaptable, pragmatic, 'vagabond' stance as described by Horning et al seems

highly relevant to the findings of the present study, which point to individuals deploying a

complex set of orientations and strategies in their engagements with learning technologies

which may appear superficially to be contradictory or incoherent, but in fact allow them

navigate this complex area of social practice in a highly nuanced and emergent way which

recognises the challenges and opportunities for engagement. This seems to undermine the

validity of typological categorisations in this area, and by extension weakens the (already

contentious) applicability of typological conceptions such as 'digital natives' and 'digital

immigrants' (Prensky 2001), and also raises serious questions about the validity of

taxonomic conceptions of 'digital literacies'. The data do not support modelling approaches

which seek to isolate and quantify this inherently messy, subtle, constantly shifting and

fluent form of intimate engagement with technologies which involves constant adaptation

and decision-making based not only on pragmatic considerations, but also emotions and

identities.

Across the themes, the students are seen to respond in various ways to challenges surrounding time which arise through their engagements with technologies – they deploy adaptive and creative practices to deal with slowness and overload, either speeding up their practice through strategic engagement with the problematic technology, or choosing to disengage from the digitally mediated setting altogether. In these themes, we see the students interacting with *slow* or *overloading* aspects of technologies in order to go faster.

They also make agentive decisions surrounding where and how to place their priorities in terms of '*keeping up'*, recognising the impossibility to keeping abreast with all new software and hardware development they will encounter. In this case, the students appear to be managing the speed and deliberated pausing or slowing things down through their choices. Similarly, they use a range of practices to cope with the fast, relentless deluge of information and messages they receive via *intrusive technologies*, and the perceived expectation that an instant response is required. In these two themes, the students seemed to be working to slow things down in order to make their practices more manageable.

The final three themes of *technological / embodied action*, *making future time* and *constant entanglements* appear to show a more harmonious interplay between the students and technologies, in which the technologies help to co-produce social action, with in some cases devices acting as close companions in the students' practices and day-to-day activities with the process of their days produced in close symbiosis with technologies.

In various regards we can see how the students not only experience time but appear to actively and creatively *create time* in conjunction with technologies – at times pushing technologies to go faster or be more focused, at times struggling to keep up technologies

appearing to run ahead, at times working in intimate relationships with devices to co-produce their days.

The iPads, laptops and phones reported in this study appear to inhabit a position as potent as the classroom texts reported by Lemke, and also seem to fit his notion of 'material-semiotic objects'. This seems a highly generative concept for future work in this area of research, where the centrality of both texts and devices is central, and boundaries in terms of agency are constantly shifting in a complex interplay between human and machine. This area of theoretical development seems to offer a rich set of concepts, challenges to orthodox assumption, and insights which may help us to more understand in more depth the practices surrounding technologies and time.

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