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ABSTRACT

This paper presents descriptive use of laptops as a lecturer and students engage in curricula activities over one hour of instruction. Lave and Wenger's (1991) theory of situated learning (SL) is used to contextualise laptop use in teaching and learning, inside the undergraduate business classroom. We examine how laptops are used to support teaching and learning practice and influence the curricula process, as laptops are introduced into instruction. Interpretive ethnography and participant observation capture lecturer and student descriptive narrative as they use laptops. Analysis is presented in time order and documents lecturer / student laptop use inside the undergraduate classroom.

Keywords: Laptops, lecture, students engaged, classroom instruction.

INTRODUCTION

This paper presents descriptive narrative on the use of laptops in class, as a lecturer and students engage in curricula based instruction within one undergraduate business course in the Quinn School of Business (QSB), University College Dublin (UCD). Description of this engagement was gathered from researcher-participant-observer field notes, which were written while attending one first year class in semester two of the 2004 / 2005 academic year. This paper aims to understand what role laptops play in supporting teaching and learning curricula activities and documents how the lecturer guides students through tasks inside the undergraduate business classroom. The objective of this paper is to explore how laptops influence levels of lecturer / student interaction as curricula tasks are delivered in class. This paper adds to literature which seeks clarification on how to build information communications technology (ICT) into undergraduate business degree programs (Rich, 2003), and provides a more in-depth understanding of the impact mandatory laptop use has on education participation within undergraduate business instruction (Fisher, Butler, & Keenan, 2004). To understand more fully how laptops influence lecturer / student interaction, we have designed a one hour observational study to examine how the lecturer integrates student laptop use into the undergraduate curricula.

IMPACT OF TECHNOLOGY

This paper examines how laptops are integrated into a QSB undergraduate business course and class to assess what impact they have on teaching and learning practice. Observational work enables us to explore the social environment in which laptops are used, and study how "technological change creates new social situations" (Sproull & Kiesler, 1991, p. 39). The study of laptops within a social educational environment enables us to understand to what extent their use is context-dependent (Zuboff, 1984, p. 61). We concur with Strum and Latour, that surrounding social environments are shaped by interaction (Strum & Latour, 1999, p. 114) and that the study of technology use within this environment, is in part, shaped by how we interact with others in the world (Walsham, 1993, p. 5). There is a need to investigate how lecturers integrate laptops into curricula tasks and assess what impact laptops have on face-to-face teaching practice and student learning. In QSB, increasing numbers of courses offer students a combination

of online curricula course materials with traditional face-to-face instruction. Observation of classroom practice provides a way in which to explore pedagogical dynamics within "on site classrooms" (Porter, 2004, p. 6). Observation also enables us to address assumptions that laptop and ICT's support classroom interaction (Weaver & Nilson, 2005); impact approaches to student learning (Byrne, Flood, & Wells, 2002) and alter university teaching environments in which they are used (McVay, Snyder, & Graetz, 2005). While there are reported benefits of educational technology use within instruction within organisational contexts (Conole, 2002, p. 14), we need further clarification of the social context which surround educational technology integration into teaching and learning programs (Brown, 1998). By observing how laptops are integrated into QSB curricula tasks we aim to understand how they impact the situations in which one learns (Fry, Ketteridge, & Marshall, 2003, p. 439).

SITUATED LEARNING

Lave and Wenger's (1991) framework of situated learning (SL) prompts us to observe "socially located viewpoints" (Berger & Luckmann, 1972, p. 19) of QSB lecturer / student laptop use within educational practice. There are many definitions of what SL means (Lave & Wenger, 1991, p. 32), however we share Lave and Wenger's explanation that SL "takes its focus from the relationship between learning and the social situations in which it occurs" (Lave & Wenger, 1991, p. 14). Observation of laptop use within the QSB classroom enables us to examine laptop supported lecturer / student interaction and study how laptop integration is undertaken. The study of situated learning also enables us to describe the context within which curricula tasks are undertaken and explore how laptops mediate access to offline and online learning materials within a social, cultural and historical context. We feel that "the understanding to be gained from engagement with technology can be extremely varied depending on the form of participation enabled by its use" (Lave & Wenger, 1991, p. 101). Interpretive ethnography and participant observation enable us to explore laptop supported educational practice and capture varieties of laptop use as they are integrated into business classroom tasks.

INTERPRETIVE ETHNOGRAPHY

Interpretive ethnography (Denzin, 1997) "provides a methodology from which to explore social practice and extend our understanding of experience of use of laptops in situated teaching and learning" (Fisher, Butler, Keenan, & O'Neill, 2005, p.55). Interpretive Ethnography (IE) is also an approach from which to observe what role laptops plays in supporting lecturer / student curricula activities inside the QSB classroom. The "essential vocation of interpretive anthropology (ethnography) is not to answer our deepest questions, but to make available answers that others, guarding other sheep in other valleys, have given, and thus to include them in the consultable record of what man has said" (Geertz, 1973, p. 30). IE enables us to engage socially within the field of research and create a descriptive record of lecturer / student narrative.

An IE approach enables us to capture participant voice inscribed as social discourse (Geertz, 1973, p. 19) within context (Ricoeur, 1981, p. 44). IE makes provision or "consideration for multiple narratives" (Boland & Schultze, 1996, p. 322). This means that in our interpretation of lecturer / student laptop use, in our analysis we should consider how different lecturer / student view points, and observed acts, are influenced by the situated social dynamics of QSB classrooms. Thus, careful consideration should be given to the contextualisation, coding and representation of data, especially when representing participant narrative (Geertz, 1973, p. 20).

IE is time consuming, organisationally inter-dependent and there is a requirement for the ethnographer to spend a significant amount of time in the field (Myers, 1999). Results are dependent on the researchers unique knowledge and experience (Schultze, 2000), making this methodology highly subjective. Ethnography is "limited insofar as it derives from what is a partial perspective" (Rosen, 1991, p 2) of research where "the ethnographer interprets that which he or she observes, experiences or was told by others, recording this cultural data in field notes"(Rosen, 1991, p. 2). As a method, Tedlock (1994, p. 455) argues for ethnographies' meaningful, descriptive qualities, while Smith (2004) prompts us to be socio-culturally aware of the presence of technology around us. As a research tool, David (2003) recognises its limiting nature and social exclusion inherent in its use, while Schultze (2000) stresses imposed community constraints on articulation of results as a significant issue.

PARTICIPANT OBSERVATION

Participant observation (PO) is a method from which to explore how a QSB lecturer and one class of undergraduate business students, use laptops and instructional materials within curricula tasks. Observation enables us to visually explore issues which surround instructional laptop use and document educational practices associated with their use (Baskerville & Myers, 2004). As data collection tool, results obtained from participant observation field notes are difficult to measure, categorise and are subjective in nature. PO enables us to situate ourselves inside the classroom,

and observe potential barriers that may exist with integrating educational technologies into instruction. Bringing researcher presence into the situation of study, requires ethnical rigor to ensure that deceptive practices in the field (Christians, 1994) are minimised (Angrosino & Mays de Perez, 2003). Thus, we present our methodology to provide transparency of our research process and join the debate of applying PO in practice (Spradley, 1980).

Coding and Anonymity

Authorisation was granted to the research team, by the UCD Human Research Ethics sub-committee in January 2005, to study the instructional use of laptops within QSB undergraduate business programs. Inline with this authorisation, all lecturer, student, class, course and program names are withheld in this paper. To ensure participant anonymity; codes have been allocated to ensure that staff and students' identities are protected. In this paper, the studied course and class are identified as Course X and Class Y. Where lecturer narrative is quoted, this is signified by the coding [LC] at the end of direct quotations. In all other cases, [L] depicts observed lecturer acts with descriptive comments. Where student narrative is quoted, this is signified by the coding [SC] at the end of each direct quotation. In all other cases, [S] depicts observed student acts, and again descriptive comments are given. All quoted speech is contained within "inverted commas". Where strings of text are included, sequential numbering depicts sentence order.

Participant Selection and Theoretical Sampling

Theoretical sampling (TS) was used to select Course X and Class Y, from a first year QSB curricula timetable, as "the most useful generalizations from qualitative studies are analytic, not sample-to-population"(Miles, 1994, p 28). Previous research analysed different teaching methods with multiple groups of students (Fisher, Butler, Keenan, & O'Neill, 2004). In this paper TS has been used to isolate a single teaching method with one group of students. In applying TS, Miles and Huberman (1994, p. 27) state that "qualitative sampling is often theory driven, either "upfront" or progressively, as in grounded theory mode". By selecting Course X and Class Y we feel we can study the situated use (Lave & Wenger, 1991) of laptops in more depth and focus.

Permissions and Authorisation

Once Course X and Class Y were selected, permissions were sent via email to the associated Course X Leader to ask permission to undertake in class PO. We felt it was important to obtain written and verbal authorisation from both Course X Leader and Lecturer A before undertaking any Class Y observational work, as at the time field research was planned, two weeks of teaching and one week of student exam revision was scheduled. Thus, it was important to secure research access to Course X and Class Y in advance. After completion of PO, a transcribed copy of results was mailed to Lecturer A to check content and obtain permission to publish descriptions.

Research Access and Ethics in the Field

Before entering Course X and Class Y, dialogue was established between the researcher and Lecturer A to ensure that there was clear understanding of research aims and objectives. Before the start of class the following dialogue was conducted outside:

> [RC1] "Ok to sit in" the class?
>
> [RC2] "Also, is there anywhere you would like me to sit"?
>
> [LC1] "Sit at the back...(pause)...get a better view",
>
> [LC2] "Better if I don't say you are observing".

This dialogue was undertaken with Lecturer A to ensure they were comfortable with a researcher presence in class, as time had passed since original contact has been made with Lecturer A. Lecturer A made the judgement that there were no issues for researcher presence in Class Y. Once in the classroom, the role of researcher-participant-observer was not disclosed to students.

Data Transcription and Analysis

Analysis has been arranged in time order (Miles, 1994, p. 110) to show the sequential use of laptops within the curricula. Time order provides focus to explore laptop use at certain points in time. This is to help pinpoint examples of interaction between instructional commands given by Lecturer A, and laptop tasks followed by students, through one hour of instruction.

FIELD NOTE TRANSCRIPTION IN TIME ORDER

Within the following transcription, I is referenced within the text. This denotes the documented experiences of Lorraine Fisher* who sat inside Class Y as the researcher-participant-observer. Within the transcript, column one gives an indication of the time of a specific observation, as recorded in side the classroom. Column two provides textual description of the observation.

12.00 PM After negotiating access to enter the Class Y, I* positioned myself at the back of the class, in the top left hand corner of the small tutorial room. This classroom seats approx 50 students, and has wireless capabilities, like the rest of the school. This classroom has three separate rows of desks which circle the room in a square formation. All seating areas have access to power sockets and network cable points, specifically for laptop use in class. There are two windows at the back of the classroom, an over head projection facility in the centre of the room, and two display screens at the front, which are controlled by a central personal computer located at the front of the class; embedded within a desk, for use by teaching staff. I position myself at the back of the class to obtain a view of the whole class. From this seating arrangement I can see students look directly at the front of the class, to view display screens.

From where I sit there are three rows of students' seats where I can observe student laptop use and application activity in front of me. At this point, the class is three quarters full and students are taking out their laptops in preparation for the start of class.

I observe that all students have laptops and are taking them out and placing them on the desks, in preparation for the start of the lecture. There is a mixture of network cables and wireless connections being used. An online content management system (CMS) has been activated and displayed by [L] at the front of the class and content is now displayed on two display screens making visibility clear from all sides of the room. An electronic document reader has also been switched on at the front of the class - ready for use.

As students open up their laptops I observe that laptop have different background display pictures, depicting various topics of interest: landscapes, cartoon characters and personal pictures. At this point the room is quiet (with limited noise and discussion) as everyone sets up their equipment in readiness for the start of the class.

12.02 PM As transcribed from my field notes, the lecture has started, and [L] goes to a PC at the front of the room, instructing students to "open up slides" [LC] which relates to curricula content. This content is available online for students to access. Upon looking around the room, all students have their laptops open, and are locating the slides which are displayed at the front of the class on the CMS. Also my notes indicate that all students have their laptops open. Indeed, I am the only person in the class who is using only a note book (non electronic version) apart from [L] who is using a PC at the front of the class to guide students through course content.

At this point in the class, all students have laptops open, numerous applications running and all observed students are at different stages in locating the class's slides. Also, it takes time for students to locate lecture notes on the CMS, after unpacking their laptops from bags and other carry cases.

12.20 PM The topic of the day has been introduced and background slides have been talked through by [L]. At this point in the class [L] stops on one slide with an example and instructs students to "do the calculations" [LC] prompting them to "do the calculations on your calculator" [LC]. The [L] introduces an example that students are required to complete in class. [L] reminds students that they "did an example in class last week" [LC] and asks students if "everyone ok" [LC] with the aims and objectives of the example.

Students are at this point are instructed by [L] to "work in pairs" [LC] to work though this example of work. An outline of the example is displayed on screens at the front of the class, and I note that students are working in self assigned groups though this work.

I note that at this point the noise level in the class rises as students discuss the task. Students also

start to locate a mixture of text books, hard copy notes and have their laptops open. I take notice of different approaches to this work as students use different combinations of materials to support them in this task.

At this point in the class, I look around to obtain more information on the use of laptops being used in this example of work. I note that there are four students [S1 - S4] sitting in front of me, all with their laptops open, and I take quick notes on which applications they are using to support their work.

I observe that students [S1 - S4] are sitting together in a line. I note that [S1] has clicked away from CMS, which contained the slides of the class and assignment to an email software package. After checking email, [S1] opens up an online text messaging service and sends texts messages to mobile phones. On completion of this task [1] accesses an Instant Messaging (IM) application before coming back to the CMS and class slides. [S1]'s interaction happens between 12.20 and 12.21.

I note that [S2] has clicked away from the slides on the CMS to an email software system, then back to slides again, at the same time that [S1] clicked away from the class slides.

I note that [S3] has remained on the CMS slides, and is working on the current task as assigned in the class.

I note that [S4] has drifted from using the CMS, to locate class slides and is working with Microsoft Excel to calculate the assignment issued in class. [S4] has not accessed any other applications.

12.30 PM I go back and note the time and observe that [S1 – S4] accessed a range of different applications between 12.21 and 12.30 pm. I observe that students are still working though task based work, room is noisier now and there is a mixture of laptops, paper and text books being used to solve assigned work, as students work together to solve assigned problems.

At this point I take note of the teaching style. The teaching style up to this point in the class has prompted students to work in physical groups. [L] has verbalised questions to students at the end of every slide. After delivery of each slide students are asked if they understand the associated concept and delivered content.

I note also that during an assigned piece of work, [L] engages with students and moves around the class; prompting for responses and offering help with specific areas of the assigned tasks. In going round the class [L] challenges the students with the comment "extract all the data that you need and plug it in" [LC] in order to "plug in the numbers and see" [LC] what the results would be. Active encouragement is given to students to use the technology on their laptops for working though assigned work based problems and [L] prompts students to use their laptops to calculate formula.

At this point I observe [S1 - S4] to see if there are any changes in their use of laptops. I note that [S2] has an IM application open in the background (behind the class slides) and is intermittently using this application (however for ethnical reasons I do not record any conversational details). I also note that [S1], [S2] and [S4] are all looking at related class slides and using a mixture of work books, note pads and text books to work through assigned examples.

12.43 PM I again focus on the teaching style used in the classroom. I note that [L] is challenging students to work though tasks using applications on their laptops and asks students intermittently "everything ok" [LC] in relation to the current task. I note the pro-active lecturing approach used to engage students, where after each slide a verbalised to check is put in place with students to address any issues around understanding concepts presented in class.

At this point, the class is nearing the end this session, and I notice that there is another prompt for "everything ok" [LC]. The class is quiet and the following prompt is given to students "not getting may yes's" [LC] to check responses.

At this stage in the class [L] goes to the front of the class and uses a light box mechanism, which displays and projects documents onto a screen that students can see. [L] writes down formulas onto

blank pieces of paper so that students can see the formula being constructed, step by step. I notice this acts as a strong visualisation tool, which appears to re-enforce the theoretical concepts addressed earlier in the class.

Upon working thought this paper based example with the students, using the document display mechanism, [L] asks a series of questions:

[LC1] "Everyone ok"?

[LC2] "Anyone disagree with it"? (the written formula)

[LC3] "All happy with it"?

In response to these comments a student asks "can you show me the example again" [SC] in which the relevant formulas were placed on the document display and the concept was worked through again.

I again look around the class and notice that [S1 - S4], who I had previously been observing, are all still using multiple online information sources as well as interacting with class slides, note pads and text books to work through examples.

12.47 PM At this point I notice that the class is nearing the end of the session. Students are still engaged in another assigned work task. The classroom is at this point very quite and students are working in groups.

As concepts are revisited and displayed on screens at the front of the class, [L] makes reference to the use of a course text book, which students now use to complement current online assignment and formula work.

A question and answer session engages students in conversation again regarding calculations, as the class comes to the end of the session.

12.52 PM At this point in the session, the emphasis changes in the class, as two students are scheduled to make a presentation on a prepared topic to the rest of the class. I observe that students are required to present on topics covered within the curricula at varying points in the course, which also provides variety within the instructional curricula process.

FINDINGS

Findings show that in Course X and Class Y Lecturer A uses the CMS to locate a sequential mixture of conceptually arranged online slides, interspersed with formulaic examples which are used to integrate student laptop use into practical assignments, at specific points in class. Lecturer A applies a teaching style which uses the online CMS to systematically discuss each slide with students. The online CMS curricula slides support Lecturer A mediate face-to-face teaching with integrated laptop use in support of practical student assignment work. Lecturer A makes inclusive use of a networked teaching PC; two display screens for presentation of hand written slides and visualisation software to support extended demonstrations of formulaic assignments to students in class. During these demonstrations, Lecturer A actively encourages students to use their laptops for calculations and data processing work.

Students actively use their laptop to access CMS curricula content; support note taking for specified assignment work and to access applications which support online communication (IM software) and virtual interaction (email), at intermittent times throughout the class. Students are encouraged to use on and offline materials to support them in practical assignment work in class. During instruction, Lecturer A prompts students to vocally respond to completed practical in class assignments, which creates opportunities for students to directly question Lecturer A in class. This question and answer technique also provides Lecturer A and students with opportunities to engage vocally, without the use of technology. This technique also acts as a vocal gauge that Lecturer A can use to pinpoint educational issues in class time, which may or may not involve issues surrounding the use of technology. Lecturer A's question and answering technique supports both Lecturer A and students jointly progress through curricula assignments.

CONCLUSION

This paper has observed Lecturer A integrate laptops into Course X and Class Y student learning activities, mediated by the CMS online curricula. Lecturer A combines face-to-face teaching activities with specifically designed assignments that make inclusive use of laptops in student tasks. This blended technique encourages students to respond vocally to questions in class and engage with a range of offline and online resource to support their learning. Lecturer A has also integrated multiple uses of software and hardware applications into teaching and engage laptop enabled students interact individually or in groups, through use of the Class Y online curricula. No restrictions are placed on student use of laptops inside the classroom, and students are empowered to use their laptop combined with on and offline resources to support their learning. There is a need to conduct further research to assess what types of applications students find useful to support their learning within set curricula tasks (de Souza & Preece, 2004). Further research is also needed to find out how teaching practitioners "infuse technology into the business school curriculum" (Smith, Bush, & Bush, 2002) as we do not know how much time and preparation went into developing Course X and Class Y curricula content. Further research is also required to assess to what extent lecturers have to learn new skills to support laptop enabled student learners (Buell, 2004) in educational practice.

Although this paper only presents one hour of observational research, Lave and Wenger's (1991) theory of situated learning has enabled us to focus on laptop use in teaching and learning practice. Interpretive ethnography and participant observation has provided us with a framework from which to capture descriptive narrative on laptop use in business education and gain some insight into its impact inside the undergraduate classroom. Lave and Wenger state that "understanding the technology of practice is more than learning to use tools" (Lave & Wenger, 1991, p. 101) and it is further understanding of the practices associated with laptop use in teaching and learning which we seek to explore in further research. We feel the merit of conducting further participant observation is in capturing descriptive narrative of teaching and learning practitioners from which to extend our understanding of laptop integration into undergraduate business education.

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