Expanding the Notion of Social Context in Educational Technology Research: Notes from the Field

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ABSTRACT

Within the past decade, researchers, policy-makers and public and private funding agencies have moved from simply calling for schools to invest heavily in technology infrastructure to emphasizing various social factors necessary for the effective use of that technology. This paper juxtaposes what appear to be sanitized, over-simplified and/or narrow understandings of social context presented in the recent educational technology literature with examples 'from the field'. Examples are taken from a recent study examining how features of the social context contribute to unintended outcomes of educational technologies. The paper concludes with a summary of the nature and meaning of social context, highlighting factors for future enquiry.

Introduction

Within the past decade, researchers, policy-makers and public and private funding agencies have moved from simply calling for schools to invest heavily in technology infrastructure to emphasizing various social factors – such as leadership, vision, curriculum, time and training – as necessary for the effective use of that technology (for example, Thompson et al., 2003, Kimble 1999, Byrom 1998). This paper juxtaposes what appear to be sanitized, over-simplified and/or narrow understandings of social context presented in recent educational technology literature with examples 'from the field'. Each example documents the power of the social context to shape, in complex and seemingly unrecognized ways, computer use in schools. Examples are taken

from a recent study examining how features of the social context contribute to unintended outcomes of educational technologies (see Garrison and Bromley 2003). The paper concludes with a summary of the nature and meaning of social context, highlighting factors for future enquiry.

In addition to the above-mentioned problem regarding the conception of social context, there is a dearth of analysis of the ways in which social factors *shape* the use of technology in schools (Brown and Edelson, 1998). For example, although researchers are beginning to acknowledge the importance of contextual factors in urban schools such as time and class size (for example, Songer et al., 2002), the specific ways in which such social arrangements shape technology use, and the role of teachers and students in this shaping, is less likely to be considered. Failure to study how these features of the context influence actors in practice, and how actors use these factors in negotiating their work and lives, has given rise to superficial, abstract and naive understandings of the social context of computer use. With some exceptions (for example, Brown and Edelson, 1998), the tendency in the educational technology literature has also been to render the context as free of conflict. This serves to obscure the nature of social interactions surrounding educational uses of technology. A focus on conflict seems immensely important as all actors in education are forced to respond to controversial government mandates such as 'high-stakes' testing in the throws of growing social and educational inequality.

This lack of analysis may stem from the 'advocacy' stance of most of the educational technology literature, which *a priori* assumes technology must, even in the face of 'all the barriers', have 'some' positive impact. With this posture, the task becomes documentation of 'effective technology use' in order to ensure the 'sustainability' of educational technology programmes (Thompson et al., 2003: 43). Yet, even if one accepts a research agenda to overcome 'barriers' (as opposed to removing them) and to 'prove technology makes a difference', the specifics of how such 'barriers' influence practice beyond the obvious is still needed. For effective use of technology in urban schools to become a reality, more nuance in how social context is conceived, along with the ways in which it influences technology use in schools, is needed.

At issue here then is neither an evaluation of education technologies as such, nor the need simply to reiterate the importance of social, as opposed to technical, factors in educationally successful uses of technology. The aim of this paper is to present a conception of social context which explores the roles of students and teachers in shaping that context, where negative and

unintended outcomes are at least acknowledged if not emphasized and where conflict is recognized as a persistent feature of the an increasingly inequitable educational system.

The nature and meaning of social context

In this section, examples of how the current educational technology literature conceptualizes the role of the social in shaping the outcomes associated with educational uses of technology are contrasted with vignettes from a recent study in which this author was the principal investigator (Garrison and Bromley, 2003). While space does not allow for a full description of this study and the methodology employed, the aim here is only to expand how researchers think about social context.

At least two notions of social context can be identified in the educational technology literature. The first category might best be labelled the classroom-centred notion of context. The designers of the Progress Portfolio, a software environment shown to promote 'reflective inquiry' among science students and teachers (Heafner et al., 2002; Zembal-Saul and Land, 2002), offer a good example in their decision consciously to take 'classroom context' into consideration when designing their software (Loh et al., 1998). In articulating a 'classroom-centred design approach' the authors write: 'While it is useful to think of classrooms as being composed of individual user-learners, they are also complex socio-cultural contexts in which teachers and students interact in highly specialised and ever-changing roles and activities' (Loh et al., 1998: 628).

In pursuing this approach these authors argue that 'social and activity structures' of classrooms should inform software design, identifying four assumed features of classrooms as being central to the enquiry design their software is intended to support: the assumption that collaboration is the norm; communication is the primary mode of learning; teachers facilitate and guide student work; curricular activity structures shape tool use. Their elaboration of the last feature is relevant here:

> The use of any software is always situated in the broader context of a task. With computer-based activities in particular, the ways in which software tools are used or not used are determined by the activity structures of the classroom, and the values assigned within these structures to different kinds of work. (Loh et al., 1998: 628; see also Brown and Edelson, 1998)

While this represents an atypically clear statement – albeit an idealized one – of the significance of human factors in determining the outcomes associated with computer-based activities, it nonetheless fails to recognize the subjectivity of, and the conflict surrounding, values. Conflict over the value assigned to 'different kinds of work' exists among students and teachers. What is needed is an exploration of what such conflict might reveal about the power of the context to shape how computers are used, by whom, towards what end, in addition to how the software is designed. Further, from my own research activity it is clear that structures and values are themselves context-dependent, as the following examples show.

One of the things that immediately struck us when we began our in-depth case-study research of technology use in an urban elementary school was, despite the school philosophy and the staff's explicit intentions, that the computer had become integrated into the reward/punishment dynamics of the classroom. For example, computer access – both for game-playing and for special projects – was granted following good behaviour, and withheld upon non-cooperation.[1] As the participant-observer for our study, I routinely worked with students on Internet-based projects, activities that often became a reward for finishing maths and reading homework. Likewise, I would hear, as I worked with a small group of students, 'If you don't stop messing around, you won't be working with Mr Mark on Journey North.' The message that access was a conditional privilege was, in fact, frequently conveyed, especially in the computer lab. In a similar vein, students were constantly reminded that the computer is not a toy (even though the fact that it is 'fun' is said to motivate them), and treating it as such would jeopardize their access. Fieldnotes from early in the school year read:

> From the first moment in the lab students were told that the computer is not a toy, to keep their hands off of other students' computers at all times (unless they have been given permission to help) and that if they play [around], they will be supervised very closely and not allowed free time with the computer – as those students who [behaved well] would.

This can also be seen in this second excerpt from my fieldnotes describing the teacher with whom I worked closely as she worked with her class in the computer lab:

> 'Mrs Crane' said [to a student]: 'Are you not interested in working on the computer? This is a privilege, you do not have to be here.' She said to him, 'every time you do not follow directions' and 'you are always playing games.'

The point here is not to criticize the positioning of the computer as a privilege, but to ask what in their circumstances makes this practice appealing and sensible to the teachers. My own experiences working with the students suggests one possible explanation. Given that the selection of students for computer work was often an impromptu decision and not based on records of achievement or other systematic methods, in both lab and classroom settings children who were difficult to work with for any reason were therefore more likely to be overlooked, or excluded. My own fieldnotes read:

> 'Anthony' wanted to work on the computer answering the questions about the spiders, and 'Mrs Crane' said that he could. While I like to give him this opportunity, he is such a pain . . . to work with, that I was reluctant to work with him. He whined and did not want to do the work [he had originally asked to do], and none of the other students wanted to work with him . . . It is very easy to get abrasive with the students, when they repeatedly don't listen, etc., that is, losing patience can really make one want only to work with the 'good' students, especially with the computer since there is so much personal attention that is needed, and also because there is more that can go wrong.

Although counterproductive in the long run, integrating the computer into a reward/punishment dynamic of the classroom makes sense for teachers who have few levers of control over their students in a school setting which values 'well-disciplined' students above all else and offers little institutional support for helping children who are having academic or emotional problems.[2] Using the computer for classroom management therefore functioned as a mechanism of social reproduction.

Upon reflection it was noticeable that those students who did and did not use the computer, and the way the computer was used, mirrored the fault lines of inequality in the society. 'Low-achieving' and 'misbehaving' students who had less time with the computer were overwhelmingly working-class and minority youth and when on the computer their activity was dominated by games and drill and practice software. Contrast this with the more enquiry-based projects for 'high-achieving' and 'co-operative' middle-class youth, who often completed the non-computer-based classroom assignments that afforded them computer access. Hence the social and activity structures of a classroom must take into account who is and who is not using the computer, towards what end they are using it, and how choices about who uses the computer are made.

That conflict exists regarding the value of computer work and schoolwork in general is sharply revealed by the following interaction, showing again how dynamics of social reproduction condition computer use. Academically

unsuccessful poor and/or minority students seemed, in fact, acutely aware of their long-term social prospects as well as their status in school. For example, I observed the following exchange in the lab between a teacher and a white student who regularly failed to do his work: 'That doesn't sound like work to me, 'Jonathan'. Chances of you getting a job in the outside world without computer skills are nil, you'll be working at Burger King.' 'Burger King, here I come,' retorted the student.

In fact, among academically struggling students, sabotaging the computer, turning it off, 'getting lost' within the computer program and 'messing' with other students' computers were typical behaviours. We conjectured that this allowed them and their teachers to put a decent face on both the students' lack of success and the teachers' embarrassing powerlessness to respond effectively. By the fourth grade at this school, both students and teachers were well rehearsed in these rituals of complementary misbehaviour and condemnation. In fact, yelling and berating students was part of what made one a teacher at this school. My first explosion at students was met with a sense of accomplishment. With a smile, one girl burst out, 'You a teacher now!' after I yelled at the class for failing to remain quiet in the hall. While these rituals would never solve the underlying problems, they did resolve the dilemma of how to get through the day without confronting the overwhelming instructional tasks teachers and students at the school faced.

Another example of how differing values condition interactions around computers is found with what we termed from our research data 'pretending'. The two varieties of pretending at the computer that we observed took the form of withholding (pretending inability) and superficial business (pretending productive engagement). While some students withheld their capacity to do their work and pretended inability to work on the computer, others put as much effort into pretending to do their work and busying themselves with its superficial aspects. These categories emerged out of trying to explain certain episodes in which students were seen to act as though they were incapable of doing, or unwilling to do, work that they had at other times shown themselves to be capable of and willing to do. For example, as can be seen from these fieldnotes on 'Brandy':

> 'Mrs Crane' said at first, she did not worry about 'Brandy', for she always 'looked busy'. But we both came to see how she just sort of shuffles stuff around, for example, with the computer, she'll just sit there and go through all the menus, from a distance it looks like she is working, but in reality she is not doing anything, except making it look like she is doing work!

We soon discovered that her main work on the computer was simply to look busy. Once we had identified this practice, we realized other students, especially female students, also routinely employed it.[3]

Why was 'Brandy' so insistent on spending her energies looking busy, instead of simply doing her work? What did that accomplish for her? Once while I was working with 'Brandy', she was allowed to finish up the assignment with me instead of going to music. She divulged that she was actually trying to avoid music and hence, at least for that day, her effort to look busy on the computer but finish little is explained in her attempt to skip music and regain a modicum of control over her own activities in the midst of a highly structured school day. Having not completed a computer-related assignment, but appearing to have 'really tried', was reason enough to skip music and keep 'plugging away'. But how was it possible to carry off such feigned business? Why was it not recognized and stopped as quickly as other more subtle student behaviours that experienced teachers routinely detect?

Consider that such practices keep the students harmlessly occupied, reducing behaviour problems. Whenever students were engrossed with superficial aspects of their work, classroom management was greatly simplified. We thus have an arrangement that 'works' for all involved, at least in the short term: so long as students looked busy and caused no trouble, they could have their autonomy and carve out some scarce private space in the generally intrusive school routine (albeit a space filled with pointless activities), and teachers could devote their attention to more urgent matters. Indeed, teachers who kept their classes looking busy and productively engaged in the lab were avoiding scrutiny in much the same manner as students who kept themselves looking busy to avoid the teacher's gaze. Both coped with somewhat unrealistic demands by controlling appearances – at the expense, of course, of substance, though unavoidably so under the circumstances.

While only a comparatively few articles in the educational technology literature give emphasis to defining their notion of social context, important contextual factors – often called 'barriers' – such as poverty and class size are at least implicitly recognized as important by virtue of a focus on effective technology use in urban schools. In fact, it appears that this line of enquiry dominates the literature (see, for example, the Center for Learning Technologies in Urban Schools, *http://www.letus.org*). This second category of literature is quite broad and complex, however, since the identified 'barriers' can be anything from teachers' attitudes regarding technology, student ability and achievement, teachers' preferred pedagogy and assessment strategies to large class sizes, lack of consistent access to the computers or the Internet and

the need for more focused professional development (Matese et al., 2002; Reiser et al., 2000; Songer et al., 2002; Wang, 2002). Confusion arises here from not clearly exploring the relationship between structural barriers such as time and lack of training, large class sizes and teachers' preferred pedagogies and espoused attitudes. Adding to the confusion is the tenuous link between attitudes and practice (for example, Matese et al., 2002).

It is in this category that the failure to think carefully about the nature of the social context is sharply revealed. For example, in the educational technology literature there is a lack of theorizing what is described as the 'pedagogy of poverty' or what McNeil (1986) identifies as defensive teaching, namely directive, highly controlling pedagogy, which values compliance to teacher and order above all else. For example, Songer et al. (2002), in an otherwise useful article, move from identifying the 'pedagogy of poverty' as a response to difficult teaching conditions (pp. 128–9) to rendering it as a set of abstract beliefs that must be changed (for example, 'low expectations') ostensibly outside of altering the conditions in which these beliefs flourish (pp. 131, 136). That 'wrong' beliefs might be understandable responses to unbearable circumstances is unexplored.[4]

In our study, we discovered that defensive teaching and defensive learning (the name we gave to students' demanding step-by-step instruction, 'forgetting' things like passwords every time they sat at the computer and thus requiring prompting) constituted a dynamic, a social 'accomplishment'. Recall that in our study we identified 'pretending' as a common student behaviour, of which we recognized two types: withholding and engaging in superficial 'busywork'. It therefore follows that pretending and defensive teaching are inseparable. Note that teachers did not appear to be unaware that students could often do more than they let on; they seemed rather to choose not to acknowledge students' skills. The fieldnotes read:

> Arrived at 10:15. 'Mrs Crane' asked me if I would work with 'Andy' [an African-American] who 'has trouble following directions'. Andy according to Mrs Crane has not completed one email session, has not been allowed to have his bio on the [school's] WWW page, and in general is only allowed to work on the computer one-on-one, i.e., when there is an adult who can give him special attention. I was told that he did not know how to use email, but by the end of my time with him he certainly seemed not only to know how to use Netscape, Eudora, but also how to set what printer to use . . . Andy reads really well. Better than the other students I have worked with . . . Mrs Crane said, as she seems to say about all of the 'problem' kids after I assert how smart they are, that, yes, he is smart and knows a lot more than he pretends to.

It was only after I would acknowledge student abilities that teachers would admit to knowing of their existence.

By adopting rigid, step-wise instruction on the computer, teachers were in effect striking a bargain with students that minimal work would be expected so long as behavioural problems were kept in check. Teachers accepted students' 'forgetting' and students behaved accordingly, seeming really to forget. Step-by-step instruction was the enactment of a contract, in effect, to 'soldier'. By effectively demanding such instruction through their own behaviour, students managed the pace and depth of work. Minimal work was exchanged for compliant behaviour, with students and teachers thereby collectively managing the impossible situation created by the presence of low-achieving students in a particular organizational context that provided little support or incentive for meeting their individual needs.

This tacit agreement struck me very directly once I began developing my own computer-based curriculum. During the third or fourth lesson, delivered in the computer lab, I encountered an unprecedented amount of resistance and defiant behaviour. What I asked of the students was admittedly much more than they had been accustomed to doing. This lab session ended early, with frustration on everyone's part. Students who were usually 'good' complained that it was too much work, and some simply refused even to try and instead openly talked with their friends. I was not new to the students nor did I typically have trouble managing the class at this point; the key to the 'bad' and rude behaviour of the students seemed to be in breaking the established norm of exchanging minimal work for general compliance.

Throughout our research we noticed that the reliance on step-by-step instruction was especially manifest in the computer lab; the question we posed is why? One important factor is that the computers themselves constituted yet another domain in which student behaviour had to be monitored and controlled; one obvious concern being inappropriate Internet material. Yet we only once witnessed a student access pornography and other kinds of inappropriate sites were also encountered rarely. What seemed to be a more significant factor was the teachers' own level of computer expertise. Those teachers deemed 'power users' by the school's technology coordinator did seem to rely less on step-by-step instruction and worksheets in the lab. For the rest, forced to bring a classroom of students into the computer lab every six days, with little formal preparation, walking through those forty-five minutes in a cautious and regimented fashion was a practical response. The kind of 'fooling around' students usually engage in, like stealing each other's pencils, requires no technical expertise to deal with, but misplacing disk folders,

deliberately getting lost on the Internet, or selecting an incorrect printer, while similar in kind to 'pencil throwing', is substantially more difficult to control without specialized knowledge.

Significantly, much of the educational technology literature identifies computer knowledge or lack thereof as a problem, often calling for more professional development which begins by focusing on giving teachers a chance freely to explore the technology and become proficient with it (Thompson et al., 2003: 36) – what the technology coordinator at our school designated as the 'power user'. Examples from our study suggest that the lack of knowledge or even desire to know is conditioned by definite social circumstances. Key here is teacher workload. Some teachers seemed reluctant to gain the computer knowledge that would facilitate less directive pedagogy simply because such expertise would be likely to end up inviting extra work. 'Mrs Crane' often stopped the technology coordinator from explaining things to her, saying she wanted only for him to fix the problem, not to know how he did it. She believed the more she learned, the more she would become responsible for. My experience corroborates this sentiment in that, once I became proficient at fixing problems related to printing, Internet access and e-mail, teachers and even the coordinator himself increasingly relied on me for assistance.

Summary and suggestions for future enquiry

At the most general level, the aim of this paper has been to expand the notion of social context, exploring how it is, and should be, conceived. It also sought to draw attention to facets of the social context of computer use in schools that demand more attention. The above presentation suggests the nature of social context is best conceived of as a *social accomplishment*, not merely a listing of variables, such as professional development, time and so on. Note here that accomplishment has no value attached to it; it simply posits that recurring interactions, including ritualized conflicts, accomplish something for those involved, including the possibility that the 'something' may be detrimental to those involved (see McDermott and Gospodinoff, 1979). The use of any technology depends then upon who is using it, towards what end, under what conditions, with what support; this of course includes uses of which many may disapprove. In addition to this, features of the technology itself may encourage actors to make certain choices over others, choices contingent on definite circumstances, including everything from the culture of the classroom and

school to state and federal policy. Thus, the context is not just the culture, or the policy, but the ways in which actors respond to and thus become part of the material and ideological life of 'the system'.

For example, the sheer complexity of the computer, as compared with, say, a textbook, blackboard or pencil, can give rise to more frustration for students having academic difficulties as well more opportunities for them to act out these frustrations in ways that appear to empower them over their teacher, enabling both teacher and student to 'save face' within an organization that struggles to meet either of their needs. Overworked teachers weary of more work might choose to remain technologically illiterate, and hence adopt a defensive pedagogy while using computers for instruction. Or, as in our instance, some teachers may take up working with technology, not simply out of a desire to advance teaching and learning, but to avoid less desirable assignments. Our 'Mrs Crane' used what the school regarded as her exemplary integration of the computer into the curriculum as a means to avoid lunch duty and having her lesson plans scrutinized. In exchange for her work with technology the administration gave her freedoms not afforded to other teachers, not to mention the extra help received in the form of university researchers! Hence the nature of the social context is not taken into account simply by measuring variables such as the number of computers, preparation time or student ability.

Given this notion of context as a social accomplishment and as a set of relations, what features of these relations warrant further study? The first and most obvious area for research is in the domain of 'classroom management'. Research exploring the degree to which computers are integrated into a reward/punishment dynamic is needed, especially given its potential role in contributing to social reproduction, the opposite of the growing desire to break down the 'digital divide'. Note that using the computer as a classroom-management tool in this way will contribute to the 'divide' even with adequate computer access. And, in what ways do the growing popularity of 'zero tolerance' policies and 'codes of conduct' influence how students/teachers interact with computers?

One problem identified in this paper is that of linking social factors such as class size or poverty with teachers' adopted practices. That is, research should pursue issues of teacher beliefs and practices as *features* of a context. Likewise, and almost completely absent from the literature, is the crucial role of students in shaping educational technology outcomes. While work has been carried out to examine teachers' belief and practices about technology, the views and practices of students in relation to technology and schooling are missing. In fact,

adopting the perspective taken here suggests that the beliefs and practices of teachers cannot be fully grasped outside their relation to their students, and their beliefs and practices. The 'Burger King' example given earlier is an example of such a dynamic, where the espoused beliefs and practices of teachers are generated in relation to those of students, and vice versa. Or, more simply, researchers might ask why some students fail to be motivated by the presence of the computer? Finally, exploring the degree to which the pretending phenomenon is present during computer-related schoolwork is needed, especially given the methodological implications. The possibility of this being a gendered phenomenon may also be particularly important, considering that women remain grossly under-represented in science and technology fields.

While the above list may seem very daunting or overspeculative, it is important to recognize that the heightened attention to the social context of computer use is both a trend and a necessity. Without a fuller understanding of the ways in which 'the social' influences outcomes associated with the use of educational technologies, development of effective strategies and curricula which will meet the diverse needs of diverse groups of students and teachers will remain illusive.

Notes

[1] This reality went so strongly against official policy that we were barred from doing work at the school for a short time for noting this dynamic during an initial presentation of our findings. While we presented this finding as likely to be a reflection of the need for more staff and other support at the school, and repeatedly emphasized that this was likely to be a 'normal' response to difficult circumstances, someone in the audience reported, with ill will, our talk to the superintendent, who in turn reprimanded the school's principal. After sharing with the school's principal and technology coordinator our presentation and views, and our regrets, as well as our desire to assist the school, normal relations resumed. Note that school personnel were invited to the presentation, but were unable to attend.

[2] On several occasions the principal and assistant principal were approached in order to get individual help for struggling students. In all cases, nothing was done. In many cases, the students in need were African-American. We were told by teachers at the school that the district does not want African-Americans to be 'over-represented' in categories like special education; hence they were denied services. This was a source of frustration for many teachers.

[3] This finding may have important methodological implications. For example, Songer et al. (2002) employed classroom observation forms as part of their

instrumentation and data analysis. The forms were used to code 'task structures in classrooms'. They designed a form to track 'elapsed time, participants, classroom description, and activities performed in the classroom'. Without sensitivity to the pretending phenomenon, reports of time-on-task may be misleading, having the tendency to render superficial 'busywork' as active engagement.

[4] There seems to be pervasive confusion between teachers' espoused beliefs as *justifications* for untenable situations and teachers' beliefs as *aspirations*. Teachers may believe something to be true while simultaneously desiring an alternative. One of the overriding findings of our work is that, despite the aspirations of the school staff to the contrary, everyone to a greater or lesser degree adopted defensive teaching strategies.

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