The Screenface: Interfacial issues of mediating interaction

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Abstract

Computer-mediated environments have become a core feature of work and learning environments. The screenface furthers the understanding of the ways in which individuals interact with others and indeed with the artefact, the computer. While interface design standardises the kinds of interaction available, individuals negotiate their interaction with the computer in highly individualistic ways. This paper describes an alternate view of appropriation of technology by individuals which takes into account the multiple ways the individuals work with technology.

INTRODUCTION

This paper is a conceptual investigation of interaction with a computer interface, designated ‘the screenface’ (Ruth 2004), based upon a program of research into online interactions in tertiary education. A number of theoretical frameworks were employed to elaborate interactions including Burke’s Pentad (1969), the concept of the ‘utterance’ from Bakhtin (1986), Lave and Wenger’s (1991) ‘transparency of artefacts’ and an understanding of the computer as ‘mediational means’ as elaborated by Wertsch (1998). These concepts combine to provide a theoretical understanding of how individuals interact with a computer. This effectively broadens our understanding of computer literacy as an appropriation of the computer interface; an individualised pattern of interaction - essentially an advanced form of computer literacy.

The concept of the screenface arises from how individuals may work with a computer. The screenface in some ways is a theoretical and teleological frame of reference for the use of a computer that mediates the way an individual works. This means that the ultimate outcome of computer use develops into a relationship between a person and a computer in a way that is highly individualistic. With increasing emphasis on computer mediation, particularly in higher education and research endeavours, computer interactions are being transformed into discrete messages, text blocks, and ideas that may be formed and reformed (responded to). For instance, in an email discussion list, each message, text block and idea can be seen to be analogous to Bakhtin’s (1986) concept of the speech genre given the complex chain that organises utterances into a particular speech genre or a conversation. Speech genres, the way that people interact, become transformed within a mediated environment due to their textual relocation and mediation.

MEDIATION AT THE SCREENFACE

The mediation of interacting with a computer, and consequently with peers and data is via the ‘screenface’, alternatively called the computer desktop, or the ‘glass screen’ (Arnold, 2002), although this is not the complete basis for interaction. This screenface encompasses the desktop (i.e. the interface to the operating system, such as Microsoft Windows or Mac OS) and the glass screen, as well as more virtual layers in between. The location of working for an individual is at the screenface, which includes the screen and the desktop as well as any other applications in use, for instance word processor, spreadsheet, statistical package and bibliographic software in particular, each of which can be customised. Each of these appears on the desktop but overlays it; appears between the desktop and the screen; appears at the screenface. Figure 1 demonstrates the layered nature of the relationship between the desktop, the interfaces to programs and the screen.
In order to investigate this layered relationship and the tensions arising from it, this paper is conceptualised within sociocultural theories, which posit the individual in a social framework and assist in answering questions about ‘what is involved, when we say what people are doing and why they are doing it?’ (Burke, 1969). Burke provides a framework, which uses five elements (the Pentad), – what is being done (act), who is doing it (agent), how they are doing it (agency), where they are doing it (scene) and why (purpose). Burke’s pentadic framework has been used extensively as a construct for viewing and analysing many communicative forms and events. Many examples exist of the use of Burke’s pentad for analysing human interaction (e.g. Kahn-Egan, 1997 and Freeman 1974). This paper takes Freeman’s (1974) finding that ‘Burke’s dramatistic metaphor offers a way of looking at the dynamics of human interaction … in the context of more sensitive and aesthetic perspectives’ and applies it to the interaction of an individual with a computer, that is, the screenface.

Technological Tensions

Wertsch (1998) emphasises the irreducibility of the interrelatedness of human action and the cultural, institutional, and historical contexts in which this action occurs with respect to mediational means, thereby going beyond a simple ‘technophobia/technophilia binary’ (Sofia, 1995 p148). The claim of interrelatedness influences analysis particularly in terms of Burke’s pentad. A focus on the ‘irreducible tension’ between agent and agency (i.e. mediational means) results in the erosion of the boundaries between them. The discussion of one relies on the explication of others, including act, scene, and purpose. Thus, agent becomes ‘individual-operating-with mediational-means’ foregoing an assumption that ‘an agent, considered in isolation, is responsible for action’ (Wertsch, 1998 p26). In other words, the agent is unable to act within a specific scene without the cultural tools, or mediational means, available within that scene, for instance a computer for interacting in a mediated environment. Within the screenface, electronically mediated interaction could not occur, neither could it occur as intended, unless there was a clear intention. Various mixes of the pentadic elements, and the dynamic tension between them, contribute to a form of irreducible tension that Wertsch refers to as ‘multivoicedness’ (1998 p99), that is, the voice of the individual and the voice of the cultural tool.

The environment, or the scene to use Burke’s (1969) term, can be viewed from a global perspective, as in the learning or research environment, or in a simpler context as where an act occurs. Further, the physical constraints of the location of the student interacting in a computer-mediated environment or a researcher undertaking a computer mediated analysis can be reduced to the interface or the screenface. Thus, the scene can be defined in terms of simple descriptors or more complex interactions between those characteristics that help define where and when an act is taking place.

The interplay between the scene and the agent often conflates the ‘nature of the inhabitants’, that is the characteristics of the agents of a scene, with the nature of their habitation (Burke, 1969 p9). Thus an ‘ideal locale’, a natural environment, for a particular kind of agent is assumed to be determined by the characteristics of the agent. A student is assumed to be located in a classroom, library or other seemingly educative location; a researcher in a laboratory or office. Likewise, those located in classrooms must be students or their co-agents, teachers; in a laboratory, researchers or their co-agents, research assistants. However given the increasing emphasis on ‘flexible’ learning methodologies, distance and online education, and flexible working conditions
the agent no longer has an ‘ideal locale’ and may be found anywhere, although different constraints may apply in different locations.

To understand the interface further, it is important to first consider the traditional terms used in definitions of computers, that is, ‘user’ and ‘interface’. The term ‘user’ arises in information systems, where a ‘user’ is equated with a role in an organisation. The definition of ‘user’ is ‘any person, organisation, process, device, program, protocol, or system which uses a service provided by others’ (Howe, 1993). For instance, users of a system such as Blackboard Academic Suite (Blackboard Inc., 2004) come in at least two forms or in two different roles. The instructor is one type of user who can add material, and manipulate data about students and courses. This kind of user can upload course content, interact with the class list, add students to the class list and so on. The interface for this type of user has specific settings for the role of ‘instructor’. The interface is ‘a program that controls a display for the user (usually on a computer monitor) and that allows the user to interact with the system [syn: user interface]’ (Howe, 1993 italics added). The other type of user for the BlackBoard system is the student. This type of user can look up their courses, find their availability, and check their status in the course and potentially the state of any assessment. There is a distinct interface for this type of user that does not allow for activities restricted to the role of instructor. Thus the user’s role in the organisation dictates the interface. Conversely, the interface with which a user works at a particular time and/or place may dictate their role (compare with a library system which has different interfaces depending on the location of computers).

**THE INTERFACE**

Thus there is a general relationship between a user and the interface. They are mutually defined depending on context. In some environments, the interface becomes personalisable. Colour and layout can be tailored to individuals’ needs or preferences. There are other parameters that are also modifiable depending on the user’s ‘user status’. This further exemplifies the relationship between a user and the interface.

On a personal computer, the desktop is modifiable within limited parameters. The pattern may be set to a particular image; the screensaver may be modified in terms of speed, colour and pattern and indeed an individual screensaver may be installed. The interface to the computer is the ‘desktop’. On top of this desktop, users place interfaces to other programs, for instance word processors, web browsers, spreadsheets and so on. Each appears between the ‘desktop’ and the screen. For advanced users, the comfort and transparency of having things on the desktop and appearing on the screenface is a necessity. There is an essential relationship between the user, as researcher/worker, and the computer, which is manifested in the screenface, the scene of their work.

A user is in a specific relationship with the screenface. This is particularly the case of research into mediated environments as all data may be collected electronically leaving little evidence of the data. This is exacerbated by working with hard copy less and less, as notes from readings are available online as electronic files. Even editing is becoming less reliant on a hardcopy, although concerted reading of a text is often better accomplished via hardcopy. In effect, what this means is that for some individuals, their relationship to the screen is more important than other aspects of the learning/working environment. They are appropriating the computer as an essential part of their activities, that is, it is ‘transparent’ to the work they do. For other users, the screenface may represent a barrier to their use of a computer with all layers behind it being beyond their ability to access (e.g. the individual who closes one application before opening another). The screenface, in essence, is opaque. Thus, the screenface becomes a boundary between the real environment and the virtual (online/computer) environment, sometimes transparent, sometimes opaque. Potentially, the differences in the ways individuals exploit or reject mediating technologies influence the outcomes that are possible. This is influenced by how ‘transparent’ mediated technologies are (Lave and Wenger 1991).

**Technological Transparency**

Lave and Wenger’s (1991 p102) conception of the ‘transparency of mediating technologies’ is important for its influence on outcomes within mediated environments. Transparency refers to the way in which the mediating technology permits or disrupts the activity for which it is used. So for an individual using a computer, the screenface represents a boundary between the user and the use. In appropriating the computer, the screenface is becoming transparent.

‘Transparency’ (Lave and Wenger, 1991) refers to the interaction of the use of an artefact for learning/research and understanding the significance of the technology with the required tasks. This suggests that employing a mediating technology, such as computer-mediated communication, is useful mainly for learning communication mediated by a computer, because it is only in learning to communicate that the use of the artefact, the computer, and its significance to the communicative act become merged. In other areas, the use of a computer may be facilitative rather than indispensable. For instance, documentary analysis with programs such as NUD*IST may disrupt the interaction of a researcher with their research material. That is, the computer does not directly influence the analysis, but rather facilitates it. For these people, a return to traditional ‘cut and paste’ methods of
research may seem reasonable. The point here is that, the artefact, the computer, and its mediation of learning/research are both necessarily visible but that visibility may impinge upon the kinds of activities being undertaken and which may not be reliant on either the artefact or its effect on the outcome. Consequently, a consideration of the importance of the artefact and its relationship to learning/researching particular sets of knowledge is important.

This discussion of Lave and Wenger’s notion of transparency highlights how important Burke’s notion of scene is to understanding how learners/researchers engage with knowledge construction at the screenface. For many people the screenface is transparent. The working document appears at the screenface and the workings of the interface to the program become secondary to the processes being engaged in. Thus, their place of engaging is at the screenface. The screenface becomes important in depicting an individual scene. Using email as an example, the interface to the messages does not remain constant, as each individual may be using a different program to access their messages. For instance, many universities and Internet Service Providers provide a web-based interface but also allow downloading email to a ‘client’ program such as Outlook, Eudora, and Lotus Notes. Thus, the scenic interface to the messages is multiple and varied, but no more so than the multitude of constructions that individuals will bring to these variations in screenface.

So because of the multiple constructions, there is no simple way to establish the totality of what the scene is for an individual in an online, working or research environment, because it is situation and person dependent. This is perhaps one of the reasons for establishing a ‘standard’ interface for learning/course management or operating systems, such that the scene becomes predictable. All individuals interact with the same interface to the system. What this does, however, is negate the individual’s way of working and places another layer, which may need to be mastered and appropriated by the student, between an individual and their work.

**Appropriation of the screenface**

In one sense, the screenface is where we use the interfaces. For some people, the screenface is the ‘touchable’ part of the computer. There is a physicality to it that is not apparent in ‘the interface’ to the programs (which includes the desktop and operating systems).

Consider for a moment, a word processor where we can elaborate ideas and process words that form those ideas. For some people, this is the extent of it. There is an acceptance of the way in which the word processor works that affects the outcomes of word processing. Consider further, the advanced word processing facilities now available, facilities such as grammar checkers, tracking changes and so on. These facilities afford particular ways of working. Part of that interface to the word processor is modifiable, but is rarely modified. The standard setup for Microsoft Word in one of the preferences is that the identity of the user is ‘user’ (often changed to the company name). When inserting comments or changes, MS Word remembers that the comment or change was inserted by ‘user’. In effect, the word processor is appropriating the individual, subsuming their identity to that of ‘user’.

This appropriation also occurs with other aspects of computer use, for instance spelling and grammar. The default for ‘user’ in spelling is ‘US’ spelling. For an Australian, this can be annoying. To change this requires at least two changes in settings. After this, the interface is modified to that setting (provided it is set to ‘default’ rather than for a single document). Aspects of grammar are also modifiable. For instance, for a typist who learned to type in the 1970’s before the proliferation of word processors, the standard number of spaces at the end of a sentence is two. However, typesetting requires a single space. In a word processor, it can be set at one space or two (and is the subject of much debate in the online world). If one space at the end of a sentence is accepted uncritically because that is what the word processor is defaulted to, then the word processor is appropriating the user. This means that the user needs to modify their way of working to suit the tool. When the way of working for the ‘typist’ is two spaces, this can be modified so that the computer becomes a tool being appropriated by the ‘typist’ rather than a tool which is in effect appropriating the ‘user’. Modifying the way of working simply because that is the default setting in some ways reduces the utility of the tool (the computer).

An individual’s relationship to a computer as an artefact is therefore variable, due to the ways in which each person individually works. For instance, whilst learning to word process, it may occur that one space becomes the default number of spaces at the end of a sentence, simply because a user learnt to word process rather than to type. However, for a typist who moves to a computer, the default has always been two, and to change that disrupts the natural flow of their process of typing. In appropriating the computer, the typist (an expert) may find the setting which allows the default of one to be changed to two, thus making the computer work for them rather than them working with a tool that requires that they modify their specific way of working. While one space may be a requirement for typesetting of documents as opposed to typewriting, the common practice still being taught in (Australian) schools is two spaces.

However, using a computer to mediate interaction, particularly through the sharing of electronic documents, the setting may be different on some computers. For the individual whose default is set to one, and whose computer
checks grammar, they end up with ‘green squiggles’ all over the text, which may disrupt their reading of the text. For the typist, whose work is being read by another, the request to change to a default of one space means that their way of working must be appropriated by the computer’s default, rather than their own way of working in which they have appropriated the computer. This kind of appropriation by a computer leads to postulating the computer, and indeed any ‘non-human’ artefact as an ‘actor’ in the network through “encoding more and more of the cognitive abilities attributed to humans into them” (Suchman, 1997). However, while a computer can influence actions, agents are able to accept or reject the use of any agency, particularly the computer.

It follows then that an individual’s status as novice or expert with the technology may directly impinge upon their ability to interact with the screenface to learn or to research. In appropriating the technology, novices may experience differing levels of tension with the technology. For instance, a novice may be unaware of protocols, the shortcuts to commands and, indeed, the commands themselves, that have been established during implementation of technologies for instance, the multiple methods of ‘cut and paste’ including menu-driven, contextual menus, keyboard commands and ‘drag and drop’. This can result in problems with an individual’s way of working and, as a result, disrupt the flow of ideas. Consequently, individuals need to be more than competent with the technology; they must understand the conventions concerning its use and through which they and others will interact. This understanding may evolve through their relationship to the computer, to the level of mastery or appropriation of the interface (i.e. the screenface), but primarily with the groups or data with which they interact.

Thus, researchers attempting to undertake qualitative research (and learners interacting) at the screenface may find their ways of working with data interrupted, their understanding of processes to be at odds with that inherent in the design. Others may find that interacting with particular applications enhances their interaction with the computer as a whole, providing avenues for appropriation of the screenface, thus an increase in their ‘computer literacy’.

MEDIATIONAL MEANS

These distinct forms of mediation between the individual and the computer exemplify the concept of mediation, particularly where there is a different form of physical contact. Students operate from individual environments and researchers work with analysis programs. Thus students’ speech is mediated by a number of factors including, but not limited to, the screenface, the interaction between the individual in a physical location and the online environment while research is similarly impacted by the interaction with digital data.

Learning and researching through computer mediated interaction requires engaging in particular kinds of mediated speech. This interaction, a form of mediated speech, provides a way negotiating learning/researching, which has been mediated by an artefact (the computer), because it is through speech that understanding evolves. The nature of the interaction/activity as being mediated by tools (i.e. the computer and speech) is brought to centre stage within the context of a Vygotskian-based (1978) approach. This is useful because, given the ‘non-physical’ nature of interacting in a mediated environment, the focus is shifted toward the processes of mediation, whether by speech or by tool. In the mediated environment (scene), an individual’s speech (act) is mediated by both speech and tool (i.e. agency of the screenface). For some individuals, this required adjusting the genre and the form of the act.

Because of this specificity to situation or context, the mediated environment requires a level of competence with an intervening technology, such as a computer, and artefacts, such as the screen and the software. These technological artefacts mediate interactions between individuals and places additional burdens on the use of the primary genres that are no longer simply ‘uttered’ (Bakhtin, 1986) but must be ‘uttered in writing’. Each interaction in the mediated environment can require a level of construction that is not necessary within a face-to-face situation. A question and answer session in a face-to-face setting, has an immediacy which contributes to the construction of knowledge not evidenced in a text-based environment. So too, the physical ‘cut and paste’ of traditional textual analysis has a physicality to it not necessarily evident in the mediated environment. Consequently, an utterance in a mediated environment becomes stripped of some of its contextualising features, such as body language, and is reduced to simple ‘words in sequence’. So, not only does the technology mediate interactions, but the textual nature of the interactions forms another level of mediation. This has effects on both the immediacy of interactions and on intersubjectivity between agents.

It is apparent that both human agency and the scene are underscored in this analysis because they influence all other elements, defining as they do many of the acts that can be undertaken. The scene is highly influential on the available acts, but in the mediated environment these acts cannot occur without the agency of the computer and networked capabilities. Thus, the how (agency) and the where (scene) become central to discussions of mediated environments. Discussions that reduce the significance of these may fail to fully appreciate the implications for the individual learning/researching in a mediated environment. These elements are defining for
the agent, whose sole contact with others, with their data, may be through the screenface, the mediated environment.

The interface and the screenface are not equivalent. The interface is the design, the screenface is the appropriation of the technology by individuals. It accounts for individual ways of working with information and communication technologies. Thus the screenface, where an individual may modify the interfaces to a variety of programs becomes important because it is here that the individual appropriates, or is appropriated by, the computer and the interfaces to the programs. The screenface provides a different lens through which to analyse learning/researching via computer-mediated communication.

CONCLUSION

A great deal of effort has been expended on developing the concept of technology literacy yet our understanding of individually appropriate uses of technology is often limited to tool literacy (Shapiro and Hughes 1996), computer fluency (Umbach, 1997) and the more recent ‘new media literacy’ (Luke, 2005). These efforts all point to aiding individuals to make use of computer technology at various level of skill. However, the screenface posits an evolving relationship between individuals and technology, one that is open to change and development.

The screenface is currently an embryonic concept, yet is central to mediated learning and research. The screenface represents the individualisation of the interface, at once both transparent and opaque. In much the same way that teaching and learning are interrelated activities, the screenface and the interface are interrelated views of computer use. Further research may provide insights into ways individuals appropriate, master, accept or reject information technology. Research into the screenface is important because this is ‘where’ an individual interacts with the computer. Individually appropriate understanding of technology will likely evolve from these efforts.

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