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# Researching the Ethical Dimensions of Mobile, Ubiquitous, and Immersive Technology Enhanced Learning (MUITEL) in Informal Settings: a thematic review and dialogue

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abstract abstract abstract

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## Introduction

In a time of rapid technological change the challenges and imperatives faced by educators are increasingly complex as they attempt to integrate the possibilities offered by novel digital devices and platforms into their learning designs, in order to enhance educational processes and outcomes. Beyond the formal education system, people of all ages are engaging with their personal technologies to form new ‘ecologies’ of learning: in the home, at the workplace and outdoors. Researching this ‘Technology Enhanced Learning’ (TEL) is equally imperative since, by better understanding of the possibilities, and limitations, of these technologies in educational settings, we may use them more effectively to enhance learning in sustainable, exciting, and

robust ways. This research is exciting, but also challenging and complex. Because of the broad possibilities opened up by mobile and ubiquitous computing devices, including (but not limited to) mobile phones and net-book computers, learners can now engage in educational activities in almost any context. At the same time 'virtual worlds'<sup>1</sup> can now create the possibility of realistic and sustained 'immersion' in educational environments that transcend the formal curriculum, portending the possibility of new forms of interaction and engagement already glimpsed through online gaming, and opening up a new vista of learning opportunities.

While these technologies reveal a new learning landscape, merging the formal and the informal, they present researchers and teachers with new ethical dimensions and challenges. In our exploration of the ethics of research into mobile, ubiquitous, and immersive technology enhanced learning (MUITEL) in this paper, we re-examine existing ethical frameworks and codes of practice, and also reflect on the role and position of ethics in research, which can be related back to Aristotelian notions of 'phronesis' as ethically informed practical reasoning (Hughes, 2001).

The principal aims of this paper are:

- To examine ethical dimensions of researching the mobile, ubiquitous and immersive aspects of TEL, in the wider context of the 'digital economy';
- To examine the recent literature on the ethical dimensions of TEL research, with a view to identifying key trends, ethical dilemmas, and issues for researchers investigating MUITEL in informal educational settings;
- To present a dialogue between researchers about the ethical challenges of MUITEL research;

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<sup>1</sup> '...persistent, avatar-based social spaces that provide players or participants with the ability to engage in long-term, coordinated conjoined action.'  
(Thomas & Brown, 2009, p37)

- To inspire further debate on how to conduct ethically committed MUITEL research among the TEL research and practitioner communities.

### **The Digital Economy and its Implications**

We have chosen to focus on MUITEL, rather than learning with desktop computers in the classroom or workplace, because learning in non-formal settings increasingly constitutes the majority of the educational interactions during a person's lifetime, and researching these new forms of interaction - enabled by personal and social digital technologies - is crucial for the development of the creative economy and, perhaps more importantly, for the 'digital society' more widely. Young people's digital engagement is a hotly contested area. Its detractors and proponents rely on different areas of research to justify their positions. Cause for concern about their digital technology usage is largely drawn from the medical model: neurological, psychological, experimental and epidemiology based studies (Dowd, Singer, Wilson 2006). Proponents, largely drawing on sociological, critical, cultural studies (Buckingham 2006), argue that young people have already successfully integrated digital engagement into their social routines.

The emergent social network technologies of 'Web 2' and 'Education 2' (Selwyn, 2008), have accelerated these trends, with implications for consumer choice and awareness, for safe and creative online social interaction, for the kinds of goods and services demanded, for the nature of education, and hence for the economic and social behaviour of increasing sections of the digital economy. In education, there is a growing divide between children's use of social networking at home for a seamless flow of activities that embrace schoolwork and informal learning, and the prohibition of Web 2 tools such as 'Facebook' in the classroom (Sharples et al., 2009). A consequence is that children's online collaborative learning, along with their

development of skills in social networking, increasingly occurs almost entirely outside the formal education system. Studying how children learn in classrooms gives only a limited insight into education for the digital economy. Similarly, to research adult learning requires analysing the ways in which learning activities form part of everyday life.

Because knowledge, value, place, and social interactions, can now be digitally manipulated (Lawson, 2004), commodified, personalised, and surveilled so easily, digital connectedness risks casting people as perpetual consumers of goods and services. However, of more concern is its potential to shift the fundamental nature of social relations, including those of education and health, linking them more inextricably to economic relations. We argue that these 'digital cultural shifts', sometimes inchoate, sometimes pervasive, often consumerist (Montgomery, 2007), have important implications for educational and social research.

Examples of these implications may be subtle and complex. An important case is the way in which personalisation of networked social tools, and their integration into everyday activities, merges with creative and informal educational pursuits. As a result, young people increasingly take such integration for granted, as a cultural norm. This blurs the boundaries between formal and informal education, and hence raises major challenges for ethical protocols as researchers attempt to understand what is happening, let alone integrate these practices into educational innovations.

The 'creative' use of immersive, mobile, and ubiquitous digital technologies within formal education has been slow to be realised, and has largely conformed to existing institutional practices, rather than taking advantage of the digital affordances of MUI TEL for collaboration and knowledge generation to radically reconstruct curriculum or assessment processes (Loveless, 2002; Green and Hannon, 2007; Luckin et al., 2008). Nevertheless, it is

important to identify the new and emerging ethical aspects of researching and innovating these usages. Research that focuses on innovative and informal use of MUITEL (and engages in the private arenas of young people's informal use of it) for educational purposes is an area that may amplify and extend these ethical challenges. It is also of great importance if the gap between young people's informal digital practices and education is not to fracture completely.

In summary, research that studies people's personal use of digital technology for learning (Buckingham and Willet, forthcoming; Crook & Harrison, 2008; Sharples et. al., 2009), and research on the use of digital technologies across formal and non-formal settings for education (Vavoula et al., 2007), presents novel ethical issues. Yet it may lead to innovations in educational policy and practice, hence there is a considerable incentive to conduct research in this area. The 'creative' use of immersive, mobile, and ubiquitous digital technologies within formal education poses a set of ethical challenges, and we have attempted to engage with these in the following literature review.

Two Technology Enhanced Learning-Teaching and Learning Research Programme (TEL-TLRP) projects (Inter-Life and Personal Inquiry) have engaged in a dialogue that prompted this paper. The projects are exploring with young people the 'intermediate ground' that needs to be bridged – incorporating informal practices and use into designed educational contexts (Holland et. al., 2008, Purdy and Walker, 2007) and supporting the continuation of learning across formal and informal settings (Vavoula et al., 2007). In doing so, the projects have to negotiate territory that by its very informal and collaborative nature require ethical and educational processes to be negotiated and distributed amongst participants, rather than pre-determined by

their institutional context. This ethical approach has also been taken by the Ensemble project<sup>2</sup> in researching the use of semantic technologies to support case based learning (Tracy and Carmichael, 2010; Tscholl, Tracy and Carmichael, 2009). The research dialogue in this paper represents a discussion of the challenges faced by researchers in these three groups and their approaches to conducting 'ethical' TEL research. This discussion was influenced by the review of literature relating to MUITEL ethics that is presented as the next section of this paper.

### **Review of Academic, Guideline and Informal ('Grey') Ethics Literature**

This thematic review summarises the ethical issues that are (i) directly relevant to MUITEL (ii) specific to MUITEL research, or (iii) include MUITEL. The review includes international ethical guidelines, formal peer-reviewed literature, and emergent 'grey' literatures in this field. The ethical guidelines of 12 major international organisations were reviewed. General ethical frameworks were compared and contrasted, and areas of frequent concern investigated; specific ethical guidelines were also used to highlight common issues relating to the uses of informal MUITEL-based research. For all of the frameworks discussed, the process of their interpretation by institutional ethics review boards has not been systematically studied as far as we are aware. Apart from personal experience of such processes, we have no knowledge of how this process is enacted, leaving a significant gap in understanding how research ethics are enacted in practice in this field.

### ***Iterative and Participatory Research Ethics***

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<sup>2</sup> <http://www.ensemble.ac.uk/>

The Economic and Social Research Council's (ESRC, UK) 'Ethical Framework' acknowledges that qualitative social science research requires a different implementation approach to quantitative methods (ESRC, 2005, p.21). Recognition within the document is given to 'iterative processes' of such research. In addition, a proportional approach to assessing risk is recommended (ESRC, 2005, p.22).

Of particular significance is research that incorporates participants' social and affective engagement with digital technologies. It has been proposed (Bakardjieva and Feenberg, 2001) that researchers should move away from the 'granting, approval' mode of ethics, towards treating the participants as partners in research (participatory research approaches). The unpredictability of context and activity in some MUITEL research means that researchers may not be able to predict what ethical issues they will encounter and how these relate to ethical guidelines. Traxler and Bridges (2004), for example, note that the nature of informed consent can raise issues in mobile learning, as the process is fluid, complex and dynamic. This may lead to situations where participants are carrying out activities they have not given consent for, or that could not have been simply represented to them (Traxler and Bridges, 2004).

It is now common for participatory research approaches to be used in MUITEL research. Variability and adaptability are inherent in the very nature of participatory research and more expansive versions of participatory design. The need for participatory research to be adaptive to circumstances, to adopt different research methods, and to engage with participants in different ways at different times, makes it hard to predict potential issues in advance for the purposes of ethical review (Tracy and Carmichael, in Press). Brydon-Miller and Greenwood (2006, p119) describe action research projects as 'open-ended, collaborative, methodologically eclectic, and without specific methods, processes, or final goals determined in advance', and



suggest that this makes it hard to review, evaluate and approve or disapprove of the ethical aspects of research plans at early stages of project development. Hilsen (2006, p26) states that participatory action research cannot be reduced to an 'organisational recipe' ready to be implemented, but is rather an 'ever-present endeavour'. New understandings and transformations of practice can happen throughout the process. The development of an ethical framework is not driven by well-structured hypotheses, but rather by dilemmas and challenges that are explored with the aim of gaining a deeper understanding and improvement in practice (Muñoz and Jeris 2005, 8). Elliott (2006, p178) suggests that participatory research methods should be chosen with the aim of helping practitioners to 'develop a reasoned capacity for action in the service of their educational values', bringing consideration of ethical issues into focus alongside other methodological deliberations.

Carmichael and Youdell (2006) propose a move away from 'permission seeking' to an iterative, fluid cycle of ethical practice. Bakardjieva and Feenberg (2001) also imply that there should be more 'stages, iteration and elaboration' when carrying out online research compared to offline. They also advocate the involvement of participants at the design stage, to allow methodological creativity while meeting ethical requirements. This was expanded upon by Bakardjieva, Feenberg and Goldie (2004), who invoked two models of research ethics, as outlined by Freund (1969): the law model and the sociological model. The law model is defined by the trustee/client relationship, where the power lies with the researcher (trustee) to maintain and ensure the ethical concerns of the client. This contrasts with the sociological model, in which the parties form a 'professional collegium' and move towards the research goals in collaboration, with responsibilities and power being more equally distributed (Bakardjieva, Feenberg and Goldie, 2004). The dynamic nature of MUITEL research outlined

above leads to negotiation and re-negotiation as an essential process, with the involvement of participants, researchers and the ethical regulators as in the sociological model.

It is not always easy, however, for researchers to understand how to put this iterative and participatory approach to ethics into practice. Some of the key questions that need to be asked include: Who decides on the number and timing of iterations of research activity between ethical reviews? By what process are changes negotiated and agreed? Does the research stop while changes to ethical procedures are made?

Even if this type of negotiation and collaboration in research is feasible with adult participants, the power relationships of school-age children or minors and adults are asymmetrically established. Can a child ever be an equal collaborator to an adult? Perhaps a middle ground would be more suitable in which an asymmetry of power is acknowledged, but children's rights are respected, their views are sought, and their voices heard by researchers. The implications for the practices of ethical MUITEL research are discussed in the research dialogue, later in this paper, where we share our experiences of trying to conduct ethical participatory research with MUITEL in informal settings.

### ***Informed Consent***

The area of 'Informed Consent' is mentioned most frequently in the formal guidelines, and is of high importance for research with MUITEL. MUITEL research may utilize technologies and procedures that are novel, innovative and diverse. For example, the deployment of immersive technology to study social interactions, and the utilization of mobile technology for research into learning in informal situations can easily and quickly present ethical complexity. This can

complicate the process of gaining informed consent from the project participants, and raises issues related to negotiated consent and negotiated privacy.

The professional associations reviewed propose a written statement by the participant showing agreement to the researcher's propositions. The researcher explains to the participant as much as possible of what the research entails and, if both parties agree, a form is signed. In theory this is positive for MUITEL research as both parties have a written record of the agreement.

However, the British Educational Research Association (BERA) highlights some specific problems - relevant to MUITEL - with this arrangement. If the research is conducted over the Internet, for example, the researcher and participant may not ever meet face-to-face. Therefore, negotiating the terms of consent and obtaining a signature may be difficult. Asking a participant to tick an online box often does not work as participants may not read the preamble. The simple act of signing a consent form (a legally significant convention) poses difficulties within a mobile environment (Traxler and Bridges, 2004). Apart from the obvious difficulty in confirming consent via mobile technologies, the nature of the system means it is open to confusion regarding full understanding of all facets of the study and the stage or data to which the consent relates (Traxler and Bridges, 2004). Another issue, mentioned in the BERA framework, is that if the research is utilizing digital technology internationally then cultural differences and language barriers may make a written document challenging and open to different interpretations. Traxler and Bridges (2004) state that the legality and ethical standard of informed consent relies on the full understanding of the study by the participant. Achieving this while including a variety of linguistic and literacy levels needs careful consideration.

There is also the issue of defining informed consent. An informal MUITEL research project might, for example, involve a child navigating a virtual environment and making sense of the new surroundings. At an early stage of the project the researcher might be unable to explain fully to the child what they will find in the virtual world as this may pre-empt the research design (if an element of surprise is needed). Also, if the virtual world contains more than just the researcher and one participant, does a participant require knowledge of everything about all the other participants they will meet in order for them to understand fully what they are consenting to? Problems like these could cause considerable difficulties in explaining the boundaries of the consent.

There are many challenges mentioned in the South African Human Sciences Research Council (HSRC) ethics framework, related to working with children who have no adult to give consent. Children under 18 typically require consent from an adult to take part in research (HSRC, BERA, British Psychological Society [BPS]).

A further consent issue is raised in family or group contexts. A child may be asked to record aspects of their home life for a project on energy use, and post the results on a class website. Therefore, the results the child posts may include private information about other people with whom they share a house. Should consent be asked of all the occupants of the house in case personal information is accidentally uploaded along with the participant's? This is a central issue for MUITEL research but it is not covered in the frameworks we reviewed.

When using chat rooms and online fora, researchers and participants may have to make themselves known in order to gain informed consent (Blackstone et al., 2008). Verification of identity in this instance is very important when dealing with or excluding children or minors

(Blackstone et al., 2008). This raises the issue of which adults (e.g. moderators, teachers, and researchers) are acceptable as participants in, and viewers of, child-oriented chat-rooms and online communities. Just because a person may be a responsible adult, that does not mean they have a right to view child-created content, particularly if they have authority over that child.

The National Education Association (NEA - America) guidelines state that the educator 'shall not unreasonably restrain the student from independent action in the pursuit of learning'. Of course, what is considered unreasonable here is open to debate, and must include numerous factors such as safety, the subsequent effect on others (both participants and researchers) and legal, ethical and moral considerations. Educators and researchers therefore have to be careful that by specifying exactly those things to which a participant consents, they are not in turn restricting the latter's educational actions. In relation to these issues regarding consent, the guidelines are often vague and provide little that is concrete for MUITEL researchers.

The ethical guidelines provided by the British Psychological Society (BPS) do provide some advice by proposing a briefing as a way to elucidate consent. They also suggest designing the project to give participants the option to withdraw from research if they disagree with the project's development. This raises challenging issues. For example, a researcher may encourage a young person to participate in developing an online community where they develop a sense of belonging, involvement and ownership. The guidelines suggest that the researcher tells the participants that they have the right to withdraw from the research if they disagree. But disagree with what? Other participants? The way the researcher is behaving? The researcher taking control? We must ask what affect this would have on the rest of the new community and whether suggesting that someone might leave does actually offer them realistic

way of taking control of their involvement. Consequences might include damaging the educational activity of rest of the community at a critical point.

***Access to technology: potential for discrimination and abuse***

Rundle and Conley (2007) state that access to new technology may stratify the provision of education economically, giving those who are unable to participate a lower chance of success. In relation to MUITEL, it raises the issue that only those with the means to participate can benefit from the mobile and immersive facets of education and research participation

Access to mobile and social networking technology may introduce cyber bullying and other socially damaging practices into educational contexts. The adoption of technology by adolescents to do harm to one another, socially and emotionally, is significant (Grinter and Palen, 2002). The subtlety and prowess of such behaviours may mean that they go unnoticed by even the most stringent teacher/researcher. Again, conflict between teachers and researchers could arise: while the study of emerging behaviours online may be central to the research, is it acceptable educationally?

There is also concern about the use of private languages and nuanced meanings in such interactions. The rate at which adolescents can generate new, meaningful commentary is impressive, and by moving this, sometimes harmful, commentary out of the ephemeral conversation into enduring text, under a teacher's gaze, it may lend weight and legitimacy to it in the eyes of both recipient and sender. In a non-educational setting, the response to subtle bullying may be to log off, but in an educational setting, this reaction may be less likely, due to the conflicts of participant withdrawal discussed earlier.

It can be argued that schools may reproduce the economic and social relations of the broader society in which they are situated. Therefore the issue of what language is 'harmful' is context and culture dependent. Any informal learning project that engages with issues of social justice will have to deal with these behaviours 'spilling out' into the relationship possibilities it creates. Online material may remain visible for extended periods in the lifetime of the participant, and beyond. So language and content that may be appropriate at one time of life may be embarrassing later. This relates to the issue of dealing with user-generated content, which is discussed in the following section.

### ***User generated content***

In this section we examine the recent literature on the ethics of using participant generated data and personal data in research studies. These issues relate to ethical commitments to informed consent, anonymity and data protection. They highlight the need for further reflection on how these issues affect MUITEL research.

Misic and Mitchell (2009) discuss the collection and storage of user-generated content, quoting Lonsdale's (2004) five ethical questions on personal data. These are:

- What information do we obtain?
- How do we obtain it?
- What do we use it for?
- What risks are there in doing this?
- What do users think about it?

These points are important when considering how ethical practices might operate in MUITEL research. Misic and Mitchell (2009) suggest an addition to the consent form stating that 'the Internet is not a safe medium, and there are potential security risks where data is gathered, stored and used'. This is a limited response to a problem that must be considered carefully.

Blackstone et al. (2008) suggest that using material comprising text or pictures from Internet users can be problematic, especially if identification of individual authors is concealed as part of the research. For example, potential authors must give their consent to the use of their material by third parties. If this is achieved by signing in to a system, their identity might be partially revealed. Blackstone et al., (2008) point out that this issue depends on the context where the material was created, and how it will be used. For example, if a chat room is considered by its users to be public, that leaves relatively few confidentiality issues; if considered private, these issues are abundant, especially with anonymous users.

In a case study mentioned on the Australian Society for Computers in Learning in Tertiary Education (ASCILITE) website (Applebee, McCormack & Donnan, 2002) an online educational course was taught by the University of Australia to home and international students. Postings were analysed from a bulletin board highlighting issues between international and Australian students. The postings were made anonymously and consent was not asked for their use. However, as the research progressed complaints were made from some of the students involved who argued that although no names were given while posting, the context of some of the quotes made their author's identity obvious to outside parties. A student who posted a message was angry that he was not asked for his consent, stating that he could easily be identified and that had he known his anonymous posting would be used in research he would have changed his wording or not posted.



This is confounded further when answering the question posed by Bakardjieva and Feenberg (2001), namely, is technical accessibility equal to a resource being public? The authors discuss this, and summarise the existing disagreements between those who answer in the affirmative and negative. The authors then attempt to place themselves on a continuum of levels of privacy in real and virtual settings by Robson and Robson (1999). As they find themselves in an intermediate grey area of the continuum, they concede in a footnote that the question remains open. The vast diversity of user-generated content may require a more subtle definition of public/confidential. This is shown to be a key issue, and will be discussed again later in this review.

Bakardjieva and Feenberg (2001) also discuss the making of observations as part of studies of online discourse. They raise the issue of researchers proposing to study one aspect of an interaction, and then focussing on another as it emerges. This issue relates to consensual ethics in all manner of research applications. In one illustrative example (Bakardjieva and Feenberg, 2001) a participant did not agree to allow researchers to save, analyse, or quote comments made online, but was keen for researchers to view the discourse, then ask him/her questions on it. This was seen as a way of preserving his/her anonymity in the research process, and limiting the use of the comments out of context, or any chance of misinterpretation or uncontrolled use. The user stated that they needed the security and insulation from the discourse, but was prepared to comment 'offline' about it.

### ***Attachment***

An area of concern encountered in the current 'grey literature' surrounding MUITEL, was that of the ethical issue of attachment. Introducing students to new technology and mobile communication devices for educational research purposes is a fundamental aspect of MUITEL.

Comments from a High School Principal posted on a blog about mobile learning (Mobile Learning Blog, 2010) raise some interesting ethical points regarding the introduction of mobile technology to students. On the blog the principal states that

'I would add that while students view their cell phones as a social toy, they also are possessive of them as a personal communication tool, almost as personal to them as their lips and ears. I have observed that asking a student to give up his or her cell phone is like asking for their ear or mouth'.

This point highlights the fact that researchers working in the area of MUITEL need to consider what effect giving or loaning technologically advanced hardware to their participants will have upon them. If a project distributes high-tech mobile devices to participants for the duration of a study, there is the potential for the student to become accustomed to the device as the project develops. This may also be increased if the student has added personal information on the device (such as contact addresses), or has saved personal exchanges (such as text messages).

Asking for the mobile devices back after the project's completion could cause upset to the participant who has become familiar with using the device in an informal setting and has come to rely on the device for personal use. This issue of technological attachment relates to ownership of content. A possible solution for MUITEL researchers, to tackle this issue, might be to download all material on the device and provide it to the student as a personal record at the end of the study. However, for technical reasons this may prove difficult during some projects. Of course, the researcher must also make sure that the machine is fully reset before handing to another student, and that no personal data be carried over.

A further ethical issue is the impact that temporary ownership will have on the participant's personal feelings. Introducing expensive technology to a participant from a deprived background may enhance feelings of exclusion from those that can afford the technology, and remind her/him that they could not normally purchase such a luxury. Conversely, some participants may be reluctant to become attached to the device, since it is not personally owned. Research from a study involving loaned personal digital assistants (PDAs) found that some of the students did not appropriate the device due to that fact the devices were loaned and not given. The students were reluctant to invest time and money in personalizing and extending the PDAs if they were unable to keep the devices at the project's conclusion (Corlett et al., 2005).

A final issue relating to attachment is that of 'cool' technology. MUITEL researchers may discover that some children/students are embarrassed to utilize devices supplied to them because they are not 'cool' - possibly due to colour, make, or the device itself. Consequently the student involved in the research may refuse to operate the device in front of their peers, which could have a detrimental effect on studies researching MUITEL in social situations. In response to all the attachment issues mentioned in this section it is important for MUITEL researchers to carefully consider the social context as well as the educational setting within which their research is operating, and to tailor their research appropriately.

### ***Introducing unsuitable materials***

The issue of unsuitable materials in MUITEL research depends upon the age of participants. Misic and Mitchell (2009) make an important distinction between 'children' (0-18 in the UK, via The United Nations Convention on the Rights of the Child, 1989) and 'minors' (12-20, depending on country). This distinction is important in the legality of international research in this field.

Offensive content can vary immensely and is dependent upon the context and the cultural environment (Misic and Mitchell, 2009). This may have a profound effect on the nature and content of international MUITEL applications. Traxler and Bridges (2004) state that it is the duty of the researcher to limit the risks posed by participants accessing or being exposed to spam, harassment, abuse, hate-mail and harmful external websites. However, they also have to inform participants, parents/guardians that the potential risks is there. At the same time, the contextual elements of what is considered harmful or abusive are quite diverse. This becomes increasingly more complex when combined with the issues of user-generated content. An example is the practice of 'obscene picture messaging', over which the organisers cannot possibility have any control but for which they might nevertheless still be legally responsible (Traxler and Bridges, 2004). Even disciplinary measures only deal with the matter after the incident, and could therefore be considered ineffective (Traxler and Bridges, 2004).

Misic and Mitchell (2009) created a set of bespoke guidelines for participants of their project, concerning invasive or offensive user-generated material. They also state that rules for participation prohibited harassment, inappropriate commentary and spamming. This requires moderation, with the decision about which content falls into these categories being taken by the teacher/mediator, as a professional responsibility. Carmichael and Youdell (2006) support this approach, including single account operation, arguing that a positively framed behavioural code, rather than a punitive one, encourages honesty, respect and dignity. This may provide the basis for a level of discipline below expulsion (such as two warnings). Contextual issues arise about deciding when valid argument is deemed disrespectful, requiring careful and immersed mediation. This puts a teacher into possible conflict with a researcher, since the researcher may wish participants to debate or express views that a teacher finds unacceptable. Carmichael and Youdell (2006) propose a re-definition of the term 'anonymity' to take into account the plethora

of surrounding information that comes with immersive interactions. This includes group or associative identity that the participant may not be aware of beforehand.

### ***Intrusion of privacy***

There is potential for researchers working in a virtual environment to become blasé about the issues of privacy as face-to-face contact can be avoided and it is relatively easy to hide the physical identity of participants. However, the consensus of the ethical guidelines reviewed is that great care should be taken to maintain the privacy of participants. Researchers should not assume that because online participants are anonymous they are also unidentifiable. Identity itself can be a focus of MUI TEL research with informal immersive technology being utilized for investigating identity, community development and interpersonal relations (Sclater and Lally, 2009). While considering the advice in ethical guidelines of maintaining anonymity where appropriate, researchers should, however, question whether it is feasible for their particular research. For some MUI TEL research projects, having a group meet anonymously may be detrimental to the project's ability to build a cohesive community and so aspects of privacy must be considered through the designs of the particular research.

Traxler and Bridges (2004) note the possibility of mobile devices revealing aspects of the participant's identity, such as location or the model of device. This may occur without the participant's knowledge or consent. They maintain that it is the responsibility of the researcher to indicate all ways that identity may be revealed, or used in research.

Holland et al (2008) discuss the significance, in ethical terms, of the intended audience of the research findings. They show how one participant was happy to have transcripts and

videos shown to the academic community, but was sure that, despite measures to secure anonymity, they would be recognised, and their interactions perceived negatively by their peers or parents. This raises the question of dissemination outlets being an explicit part of consent so that participants and their families/peers/teachers may have some knowledge and choice about where research outcomes may be published.

Traxler and Bridges (2004) suggest clear, ongoing communication and description on the status of online interactions in terms of their public/private status. The belief that the interaction is private when it is not, or vice versa, could have an impact on how participants contribute, and the status of their consent. The awareness, by both researcher and participant, of the privacy status of their study needs to be ongoing, as some activities can rapidly alter participants' and researchers' wishes regarding privacy. Holland et al, (2008) showed that when participants carried out work individually with the researcher, the opportunity to compare commentaries with other participants to get their feedback as a group was lost. This was because of ethical (privacy) issues surrounding participants having access each other's data.

Another issue around privacy is that of reproduction of mobile and immersive data. The researcher may have secured a private locale for the interaction, and ensured files are stored with encryption, yet many mobile platforms allow the user to copy, cut and paste text content. For instance, a group shares user generated content in the research (private) arena, but some of the participants may then copy the comments or entire interaction, and use them without limitation (Talbot, 2002). One example is the use of Internet Messenger exchanges over the topic of bullying in the private area, which one participant could copy, save, or print from the screen in order to hold the information, and re-distribute it at will.

The use of text quotations secured from online, hosted interactions in publications of research findings may result in the possibility of the identity of the informant being established by others using full text search engines. This needs to be taken into account by the researcher.

### ***Unmonitored spaces***

Another major ethical issue that affects MUITEL research is the issue of moral obligation and conflicts of professional conduct. In a hypothetical scenario, for example, a participant has been given a mobile video device to record a visit to a science centre for a study on self-directed learning. However, while analysing the participant's videos the researcher becomes aware that the participants have not been adequately supervised and several health and safety violations have occurred. The researcher would ideally like to perform follow up work with the same participants, but worries about how safe they are under the care of the teacher. Morally, something should be said to prevent any harm coming to the participants on the next visit. However, this may jeopardize the working relationship between the researcher and the school, and possibly prevent further research and the completion of the project. A related issue may also occur if the researcher captures an incident - such as a fight between children - on video, and the school requests the recording as evidence for disciplinary proceedings. Further, an issue could arise where a MUITEL project provides private space for its participants and in that space conversations happen that, from the researchers' point of view, contain morally suspect matters. This presents a 'difficult to resolve' ethical issue for the researcher, with potential conflicts of interest.

## **Summary**

In this section we have reviewed and analysed the general ethical guidelines of each of the 12 organizations identified as offering ethical guidance that may be relevant to MUITEL researchers. We have organised this analysis thematically, and presented potential or actual ethical challenges for MUITEL researchers. We have also indicated possible solutions, and highlighted situations where the challenge remains problematic or unresolved. All the associations highlight the need to 'above all, do no harm'. However, what precisely constitutes harm in the guidelines, and research in general, is based on a complex mixture of moral, legal and personal criteria. This presents challenges for informal MUITEL research with its capacity to straddle traditional research boundaries.

### **A Research Dialogue: the possibilities and challenges of conducting ethical MUITEL research**

The purpose of the discussion, between the authors, was to elicit and clarify our perspectives on the ethical issues surrounding MUITEL research ethics. We had access to the thematic literature review presented above. We wanted us to bring this alive by providing an account of our own interpretations of the issues, and reflect on our experiences when working within a MUITEL research framework.

The first of the issues discussed was that of 'boundaries', and specifically the disappearance or blurring of them during MUITEL research. Much of the research in teaching and learning up to this point has relied on the assumption that agreed boundaries exist within the research context:

- That teaching occurs in the classroom or science laboratory.
- That all students will learn at the same time, within the same physical space.



- That learning is a public and transparent activity, held in a distinct partition from personal or social endeavours.

When looking at learning in the MUITEL context, it is apparent that these boundaries will at the very least be blurred, if not altogether eradicated. It is a challenge for the researcher to identify the extent of this effect, and to show that this is what is intended, and ensure, for ethical purposes, that this is clear to all parties involved in the research. The need to be honest about the extent of data collection, storage and uses, as well as being open about the dissemination of the findings, is crucial. The unpredictability of informal and mobile learning activities encourages a more flexible and sensitive methodology. An example from the Personal Inquiry (PI) project concerns the practice where pupils are loaned laptops over extended periods, for use in and out of school (Anastopoulou et al., 2008). Although pupils may be aware that their use of particular programs was recorded, researchers had to ensure the students knew that all uses of the laptop (web browsing, downloading etc) would be stored. The possibility that students did not see these informal activities as recordable had to be considered.

Another point of interest sprouting from this was the concern about reducing the authenticity of informal observations. As interest in social, mobile and informal learning grows, researchers begin to openly discuss recording such actions. How will this monitoring influence the participant? For example, will browsing habits change, and how will this transform the use of online or social tools?

An example from the Inter-life project illustrates the complexity of the boundary between what is considered private and what is not, in the eyes of the participant. While providing a creative, immersive online learning environment, the decision was made to record

all interaction, to help in the event of a problem (e.g. bullying). In order to allow participants the opportunity to collaborate in private, diary rooms with controllable recorders were provided. This gives the student a clear option to be recorded or not, making the privacy boundary much more visible.

This type of activity may lead to unpredictable outcomes. An example from the Ensemble project was discussed in our dialogue, where university student participants in a case-based learning study transposed the task away from the controlled conditions of the researcher's online tool, onto a popular social networking environment. The blurring of the formal/informal boundary places a degree of control into the hands of the participants, as they can decide on which side of the fence their social interactions lie. How to continue after such an event is problematic.

“If you have a fairly broad consent and then the rules of engagement change in the way that you're saying- you're wanting to study children's or students' informal learning practices, you give them some tool that they're working on and then they migrate to another tool, do you have the right as a researcher to follow them into that new space, whether it's virtual or physical?”

With the increased unpredictability of MUITEL research must come a more thorough exploration of informed consent. As the data collected in these studies widens in scope, researchers will have to make great efforts to ensure participants understand what they are giving consent for. It seems unacceptable to us that, given the sensitivity of the data collected, that participants should not have a good grasp on the aims of the study.

“We did find that there were different understandings of the terms that we were using because we were working in different disciplines where maybe in a law setting or a

historical setting, just the words would mean something different. It was important to have that conversation with people and to maybe adapt the wording in the code of practice for that setting as well.”

It strikes us that the best way to ensure participants have a better understanding of research work, and are comfortable about what is recorded, it is to talk to them. One of the key factors we have identified in successful MUITEL research is the consequent re-positioning of the role and status of the researcher.

“There’s arguably an arrogance of researchers, just as there’s an arrogance of teachers, which goes that any research subject, providing they’re provided a letter of consent, the researchers should have the right to probe into all the activities they’re doing. Same with the teaching, the teacher has a right to manage all the learning that is related to school, whether it’s inside or outside the school. I think we’ve got to be a little more respectful of the learning activities of children.”

The idea of a participant as a passive party, as the ‘subject’ of a study is, we feel, totally incompatible with this type of research. Iterative and participatory approaches, including consultation and agreement with participants are two ways forward. For example, the terms of a consent form benefit from the input of the people who will sign it. This will aid the understanding of the participant; it may foster a sense of the significance within the study. The negotiation and, re-negotiation with participants can lead to a more authentic engagement with the project, and hence enrich the outcomes of the research.

What might the move from ‘traditional’ ethical practice to the ones described here look like? We began to answer this by discussing the existing frameworks and how we use them.

“We have come across different types of ethical reviews and found that the ones that inspire reflection and allow for a more discursive response in the form have actually been

far more useful than the tick box-style review that asks you to predict all future methods and classify the roles of all the participants.”

We found that the existing models of ethical practice were very useful as a trigger to discuss and design more context specific practices. The limitations of the current ethics process when engaging in MUITEL research were highlighted.

“It's not a lot of help because the formal process that we've gone through here has really failed to grasp some of the issues of a project, and has granted us ethical approval whilst, in my judgement, failing to understand the actual issues we're facing.”

This suggests that the complexities and subtleties around research in this area are not, at this time, being appreciated.

“The problem with the formal process is that it's a single event and it happens at the beginning of the project. You don't really get any feedback besides pass or fail. You'd probably get more feedback if you failed but that in itself might give you the impression that that was all the consideration of ethics you really needed to do, but that's not it at all.”

Ethical review processes are most valuable in MUITEL research if they are understood not as 'approval' or 'clearance' but as contributing to, or even initiating, formative and dialogic practice. So while the existing frameworks and processes are useful as an initial evaluation, researchers in MUITEL must consider how these should be extended to deal with the variety of informal, immersive and mobile activities we facilitate.

The vital question remains: how do you construct a more comprehensive ethical process, particularly in boundary-crossing areas like MUITEL research? One suggestion is that an extended ethical statement could be constructed, and used to establish a more independent, informal review mechanism. For example:

“One of the things that has developed in the Interlife project is to establish independent ethical review panels stimulated by the project. So we have one in Sheffield and one in Glasgow by which we can run the developing procedures as we negotiate them with the young people. It feels like it offers the possibility of some reassurance, and the involvement of another set of professionals who don't have a vested interest in the project as insiders, having the opportunity to comment on things as they develop, which feels a bit better.”

The most striking similarities between our own views on ethical processes arose here. We believe that the expertise of the researchers familiar with the field should be harnessed because they understand best the challenges of their research. At the same, the issues raised can be reviewed in an ongoing process, helping to create an environment of clear understanding and co-operation, over the entirety of the project. Using the experience of colleagues in this way may help to build a code of practice specific to the context, while at the same time being fluid and flexible to the needs of the study and its participants as it develops. We strongly advocate this iterative, incremental model of ethical design.

“People who are doing research in this area need to see ethics as being a process which is developed throughout the research and maybe needs to be modified throughout the research, rather than it just being seen as a threshold at the start.”

This may sound more labour intensive, but we think that this is how the future of ethical processes in this field might evolve.

“I think you need to see it as part of the role of being a researcher, that you are constantly considering the consequences and what-ifs and thinking about what is a good thing or a bad thing to do. That isn't compartmentalised into ‘ethics’ even, it's just good quality research. ”

## Conclusion

In this paper we have attempted to examine ethical dimensions of researching the mobile, ubiquitous and immersive aspects of TEL (MUITEL). We began by trying to analyse the interactions between mobile, ubiquitous and immersive technologies and the wider context of the 'digital economy'. In this analysis we identified social, economic and educational developments that blur boundaries: between the individual and the consumer, between the formal and the informal, between education and other forms of learning. This has led to a complex array of possibilities for learning designs, and an equally complex array of ethical dimensions and challenges.

We then examined the recent literature on the ethical dimensions of TEL research, and identified key trends, ethical dilemmas, and issues for researchers investigating MUITEL in informal educational settings. We then used a research dialogue between the authors (as researchers) to illuminate these MUITEL research challenges, and indicate new trends in ethical procedure that may offer ways forward for researchers in this fascinating field

Ethical frameworks do not act to aid arbitration or decision-making. Instead, they provide a framing for questions to be raised about how our use and development of advanced technologies might represent a challenge to our ethical practice and that of research participants, and as a tool to encourage reflection as to how these tensions could be resolved. All the international ethical associations and frameworks related to MUITEL education analysed in this paper emphasise the importance of the researchers' personal integrity in solving ethical issues. Project discussions in which ethical issues are regularly revisited are key to conducting ethical research and realising Elliott's "ethically committed action" (Elliott, 2006). Elliott argues this is premised on 'disciplined conversation in which reasons for action are scrutinized,

critiqued and modified', and connects this approach with the Aristotelian concept of phronesis as a distinctive form of ethically informed practical reasoning (Hughes, 2001). Phronesis is one of three principal intellectual virtues proposed by Aristotle (2000), the other two being episteme and techne. Episteme is classed as scientific knowledge of eternal and universal truths (Aristotle, 2000:105). In contrast, techne is translated as art, craft or skill; the ability to 'bring into being things that are contingent and variable' (William, 2008). Phronesis transcends both episteme and techne as it concerns the problem of acting rationally in situations that are contingent and variable (William, 2008).

Ethical guidelines and processes are not moral certitudes. but reflect the shifting values of society. Only through interacting with participants, other professionals, and researchers, and discussing ethical values, can MUITEL research in informal settings be ethically sound by consensus. It seems to us that ethical issues need to remain open questions, and be revisited, as part of research practices. Because technologies and relationships develop ongoing reassessments will always be required in the light of new understandings. We hope that this analysis will inspire and support continued reflection and discussion about how to conduct ethically committed MUITEL research.

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#### Guideline Sources

AERA: American Educational Research Association

[http://www.aera.net/AboutAERA/Default.aspx?menu\\_id=90&id=222](http://www.aera.net/AboutAERA/Default.aspx?menu_id=90&id=222)

ASCILITE - Australian Society for Computing and Learning

BCS: The Chartered Institute for IT

[http://www.sqa.org.uk/e-learning/ProfIssues03CD/page\\_04.htm](http://www.sqa.org.uk/e-learning/ProfIssues03CD/page_04.htm)

BECTA: General ethical Guidelines

[http://partners.becta.org.uk/index.php?section=rh&catcode=\\_re\\_rs\\_pr\\_et\\_04&rid=162](http://partners.becta.org.uk/index.php?section=rh&catcode=_re_rs_pr_et_04&rid=162)  
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BERA: <http://www.bera.ac.uk/files/guidelines/ethica1.pdf>

BPS: British Psychological Society

[http://www.bps.org.uk/the-society/code-of-conduct/support-for-researchers\\_home.cfm](http://www.bps.org.uk/the-society/code-of-conduct/support-for-researchers_home.cfm)

Link Includes - Ethical Principles for Conducting Research with Human Participants

Guidelines for minimum standards of ethical approval in psychological research

Conducting Research on the Internet: Guidelines for ethical practice in psychological research online (2007)

ESRC: Economic and Social Research Council (pdf)

[http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/Images/ESRC\\_Re\\_Ethics\\_Frame\\_tcm6-11291.pdf](http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/Images/ESRC_Re_Ethics_Frame_tcm6-11291.pdf)

HSRC: South African Human Sciences Research Council

[http://www.hsrc.ac.za/Corporate\\_Information-6.phtml](http://www.hsrc.ac.za/Corporate_Information-6.phtml)

NEA: National Education Association (America)

<http://www.nea.org/home/30442.htm>

SERA: Scottish Educational Research Association

<http://www.sera.ac.uk/docs/Publications/SERA%20Ethical%20GuidelinesWeb.PDF>

SRA: Social Research Association

<http://www.respectproject.org/code/index.php>

TLRP: Teaching and Learning Research Programme

<http://www.tlrp.org/capacity/rm/wt/bridges/>

additional refs

## Relevant Websites

Example of online problems/ appropriate response to problems

[http://schools.becta.org.uk/index.php?section=is&catcode=ss\\_to\\_es\\_pp\\_aup\\_03&rid=12002](http://schools.becta.org.uk/index.php?section=is&catcode=ss_to_es_pp_aup_03&rid=12002)

E safety Policy

[http://schools.becta.org.uk/index.php?section=is&catcode=ss\\_to\\_es\\_pp\\_pol\\_03](http://schools.becta.org.uk/index.php?section=is&catcode=ss_to_es_pp_pol_03)

Safe Internet Use

[http://schools.becta.org.uk/index.php?section=is&catcode=ss\\_to\\_es\\_tl\\_uor\\_03&rid=1752](http://schools.becta.org.uk/index.php?section=is&catcode=ss_to_es_tl_uor_03&rid=1752)

E-safety: Developing whole-school policies to support effective practice

<http://publications.becta.org.uk/display.cfm?resID=25934>

Acceptable Use Policies (AUPs) in context: Establishing safe and responsible online behaviours

<http://publications.becta.org.uk/display.cfm?resID=39286>

Mobile technology and e-safety –

[http://schools.becta.org.uk/index.php?section=is&catcode=ss\\_to\\_es\\_pp\\_mob\\_03&rid=17223](http://schools.becta.org.uk/index.php?section=is&catcode=ss_to_es_pp_mob_03&rid=17223)

Upholding scientific standards

<http://www.respectproject.org/code/cstds.php?id=>

Compliance with the law

<http://www.respectproject.org/code/clegal.php?id=>



Avoidance of social and personal harm- <http://www.respectproject.org/code/charm.php?id=>