A Defining Moment in E-Working: The Application of an E-Working Definition to the Education Context

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ABSTRACT
Using qualitative data gathered through 144 questionnaires completed online by education sector personnel, this paper examines the relevance of a definition of e-working to the educational context. It identifies that the definition, which draws on and extends existing knowledge and identifies e-working to be a way of being a worker as well as a way or a mechanism for carrying out the work task, has clear potential to be applied within the education sector. The paper identifies that it is not the composite elements of the definition which may appear alien to the worker in the educational context, but instead inference drawn from the way in which the e-working term has hitherto been regarded.

INTRODUCTION
In recent years there has been an increase in the number of people who see themselves, or whom are seen, to be working flexibly as a consequence of the presence of technology. Furthermore, the nature of flexible working has changed alongside developments in that technology. This mechanism for working need not necessitate being away from the work place any more than being away from the workplace is any longer inherently linked with not working; typically 'the day off'/annual leave or sickness absence.

Whilst educational institutions are seen to make active use of technology, there is suggestion that they, and in particular schools, have been less open to technology-supported flexible working arrangements. Underpinning this suggestion is an argument that a physical presence is essential to effective role performance and, regardless of the nature of the work and whether there are alternative ways for it to be carried out, traditional ways of working have been favoured.

This paper takes a theoretical stance by examining the relevance of the author's definition of e-working, derived as part of the author's PhD research, and a definition which both draws on and extends existing knowledge about the concept, to the educational context. The definition purports that e-working amounts, in the presence of technology, to a way of being a worker as well as a way of carrying out the work task. In furthering the theoretical understanding, the examination makes active use of survey data contributed by educational professional (largely school-based) users of technology recruited through the social media site Twitter.

LITERATURE REVIEW
Terminological vagueness
The technology term is used within the literature with a measure of constancy, for example in the need for some form of ‘hardware’ and the association of this hardware with ‘software’ (e.g. Binken and Stremersch, 2009; Breedon et al, 2012; Hogman and Johannesson, 2013; Vangelski, 2013; Thorat et al, 2013; Lin et al, 2014). The literature also places significant emphasis on technology’s potential to develop and change (Orlikowski, 1988; Earl, 1989; Monk, 1989; Knights and Murray, 1994; Alter, 1996; Teich et al, 1999; McLoughlin et al, 2001; Panayotopoulou et al, 2010; Vartiainen and Hyrkkänen, 2010; Scholarios and Taylor, 2010). There is suggestion that technological development and change is directly influenced by situational factors (Woolgar et al, 1998; Kling, 2003) and there is little to suggest that the nature and the environment of the educational context have any less influence than that seen in other sectors.

However, this potential to develop and change is seen to have resulted in innumerable hybrid formations combining both new and old technological practices (Kling and Crawford, 1999; Pinnington and Morris, 2003; Ritchie and Brindley, 2005; Faulconbridge and Muzio, 2008). Furthermore, this combination of the old and the new has contributed to there being a perceived lack of clarity. This lack of clarity is acknowledged by a number of writers (e.g. Sullivan, 2003; Clarke and Preece, 2005); a perspective potentially reflective of Knights and Murray’s (1994 p.21) ‘genesis and crystallisation of new technologies’ debate and remaining a feature even in more recent academic material (e.g. Vayre and Pignault, 2014).

Technological change has caused uncertainty and there is literature which acknowledges the fears surrounding such change (e.g. Kling and Crawford, 1999; Kling, 2003; Johnston and Waretin, 2010 and Meier et al, 2013).

For this reason a link between the use of technology and an argument of innovation appears present, at least within the education sector. There is significant emphasis placed, for example, on classroom use of Twitter being innovative (Manzo, 2009; Manchir, 2012; Stuchbery, 2013) and on teachers needing to integrate technology into their own practice, in part as an exemplar of how technology might be embraced (Demski, 2012; Larkin, 2013).

Such has been the pace of technological change more generally that it appears to not have proved possible to robustly 'map out' terminology. Indeed, Earl (1989 p.21) suggests texts have actively avoided providing technology-associated definitions seemingly on the pretext of, using a phrase highlighted by Woolgar and Cooper (1999), 'the risk of instituting artificially rigid distinctions'. If this is true, and furthermore if it is a consequence of failing to encapsulate the full breadth of technology's potential on the grounds of that technology being an ever moving feast, then perhaps it should not be surprising that there should also be some lack of terminological clarity surrounding the association of workers with that technology. After all, this 'social' element is regarded to have added a new dimension (Woolgar and Grint, 1991; Grint and Woolgar, 1992, 1995; Woolgar, 1981, 1991, 1993; Kling, 1992; Kling and Crawford, 1999; Ekbia and Kling, 2005).

Woolgar et al (2009 p.6) identify that a lack of technology associated clarity results in work being based on assumptions. It is a dimension which is acknowledged to be of significance. McKemmish et al (2012 p.985) write, for example,

> From a research perspective, enhancing our understanding of interactions between people, the contexts in which they are situated, technologies, systems and information, is seen as one of the keys to developing better information technologies, management and systems.

E-working is a term readily used in practice but receiving limited explanation within the literature, even when actively used (e.g. Chang et al, 2003; Wang et al, 2012). It is thus a term which appears to be based on the aforementioned presence of 'assumption' (Woolgar et al, 2009).

Whilst this limited mention presents difficulties for assigning a clear definition to the term, to avoid doing so risks perpetuation of what Barley (1990 p.64) terms 'a maze of analytic abstractions' and arguably fuels the argument, at least within the education sector, that e-working is a contextual irrelevance. Indeed the muddiness of the e-working understanding is compounded by an ever growing array of perspectives, the consequence of what Earl (1989) highlights as 'multiple-frameworks'. And whilst some writers (e.g. Jaakson and Kallaste, 2010; Pollitt, 2010) highlight that definition assignment has the potential to result in too narrow a descriptor, there is a strong argument presented (e.g. Agarwal and Prasad, 1998; Bassellier et al, 2001; Leonardi et al, 2013; Hyde, 2014) that the presence of these technology-related descriptors provide value through an understanding which is benchmarked to the contemporary environment.

Thus with such vagueness surrounding the e-working term identified to be generally present, it is not surprising that in an environment such as the school context, where other elements of change are at times perceived as offering an onslaught to operational practice, that clarification and embracement of the e-working term may not have been perceived as a priority. Yet attempts have been made to define e-working related terminology more broadly and it is to these which attention now turns.

Terminological usage

Amongst the attempts to provide an e-working related definition falls the work of Tijdens and Steijn (2002) who differentiate between the impact of embedded and programmable technology and Haddon and Brynin (2005) who provide definitions of assorted terms such as 'NetHomeworkers' and 'PCHomeworkers'. Earlier writing, such as that of Blauner (1964), shows a tendency towards highlighting the 'progressive nature of technology' placing emphasis on technology's mechanistic nature. This mechanistic focus stems back to the 'late 1940s and early 1950s' (Kumar, 2005 pp.33-34) and indicates that over time greater awareness of the user of technology has arisen; akin to technology being a subject for consideration within a social science framework (Woolgar and Grint, 1991; Grint and Woolgar, 1992, 1995; Woolgar, 1981, 1991, 1993).

There are various facets contributing to the clarification of technological terminology. It is seen, for example, that terminology has taken a broadened focus alongside a decrease in technological mystique. Knights and Murray (1994) and Alter (1996) demonstrate a parallel in their perspectives by highlighting that that mystique has played a role in the generation of terminological vagueness. Furthermore, Woolgar and Lezaun (2013) write of this in terms of the conceptualisation process acknowledging the influence of the individual's ontology, an argument that develops Woolgar's earlier writing on the 'perspective' of ideas (Woolgar and Grint, 1996; Woolgar, 2004). Shuen (2008 p.129) suggests that mystique can be used to overcome the discomfort caused by

technological progress ‘disrupting the old order’, a perspective which parallels with Woolgar’s (2004 p.451) observation, that “presenters of ideas should adopt a register appropriate to the presumed expectations of the audience”. Unquestionably the mitigating of discomfort may have proved useful in the contextual environment. However, with an increasing focus on technological use, what McLoughlin et al (2000) argue facilitates an understanding of technology and is suggested by Mcloughlin and Badham (2005) to reflect the increasing popularity of in situ examination, two terms have come to the fore: telework and telecommuting.

Sullivan (2003) suggests that the first of these terms, telework, is remote work using information and communication technologies. In practice the term is used to place emphasis on work being carried out away from the formal workplace, in the case of this study the educational institution, with the literature almost without exception making use of the term ‘home’. There is emphasis on the approach being non-standard (Brocklehurst, 1989; Di Martino and Wirth, 1990; Stanworth and Stanworth, 1991); with the ‘home’ link continuing into more recent literature (Golden, 2012; Bayrak, 2012; Vink et al, 2012; Maruyama and Tietze, 2012; Neirotti et al, 2013; Hilbrecht et al, 2013; Gold and Mustafa, 2013; Sayah, 2013).

The second term, 'telecommuting’, is suggested to have emanated from the association with avoiding physical travel to the workplace (Sullivan, 2003) and in particular mitigating the effect of the 1970s oil crises (Mann and Holdsworth, 2003). Jack Nilles from the Centre for Futures Research in California is credited with making first use of the terminology in the mid 1970s (Bailey and Kurland, 2002; Mann and Holdsworth, 2003). However like telework, the telecommuting term retains ‘home’ connotations (Ahuja, 2002; McLarty, 2004; Kirk and Belovics, 2006; Mayo et al, 2009; Vesilind, 2010; Fonner and Stache, 2012; Heng et al, 2012; Wheatley, 2012; Clark et al, 2012; Berinato, 2014); the base point from which travel commences.

There is, however, a smaller body of recent technology related literature (e.g. Ellison, 2012; Bentley, 2014) which identifies the existence of a ‘work anywhere’ or ‘most suitable location’ approach, despite some caution in use of the term being evident. Hortensia (2008 p.269), for example, uses the ‘virtual workplace’ term but explains this in terms of being ‘from home or other locations outside the organisation’. Hislop and Axtell (2007 p. 34) acknowledge ‘spatial mobility’, highlighting that it is ‘commonplace to see work being undertaken whilst travelling on trains, at motorway service stations, or in the departure lounges of airports’. They make mention of ‘nomadic’ terminology, but there is limited embracement of the potential to vary between different types of locations or, particularly, the potential to combine this with work at a central (organisationally provided) location such as on the school site.

In parallel to the flexible work location is the flexibility surrounding the work role. Telecommuting is still seen to have echoes of its initial ‘telephone-task’ basis, with the limitations of traditional telephony making the term increasingly redundant. Nof (2003) appears to acknowledge this redundancy and is regularly cited as explaining e-working as embracing 'computer-supported' technologies. The Nof (2003) phraseology demonstrates a broadened focus and yet even this appears to emphasise a predominant focus on the technological tool as opposed to any user of that tool.

This noted, more recently used terminology identifies the 'people presence' as having an increasingly significant influence. Historically the literature shows a tendency towards favouring a handling of the people presence under a ‘social informatics’ heading (Kling, 1977; Kraemer et al, 1979; Hiltz et al, 1981; Kling, 1991). This element is of note, but demonstrates some limitations with regard to the breadth of the people management practices which e-working embraces. Some acknowledgement of this is identified in the tendency towards a simple prefixing of ‘e-‘ alongside supervisory expectations as seen, for example, in the e-management (Hashim et al, 2010; Yao et al, 2011) and e-leadership (Jameson, 2013; Chang and Lee, 2013; Avolio et al, 2014) terms. In each case there is indication of the ‘electronic’ basis but less specification of the mechanism. In effect there is acknowledgement of a relationship between people and the technology which is made available to them, with the location at which the work is undertaken appearing less predominant.

Clarification of the e-working term

With so many facets to e-working, and many of those facets subject to development potential, it is not surprising that the full expanse of the e-working term has failed to be fully acknowledged. This may explain, although not excuse, the absence of specific application to the educational sector. Regardless of environment, this lack of clarity has implications at both conceptual and practical levels.

Drawing the aforementioned points together, it is reasoned that e-working is a mechanism for executing work-related tasks utilising technology in the form of electronic media. Since these tasks are so broad ranging, what the ‘work tasks’ associated with e-working amount to is largely immaterial. Technological media is subject to

development. This developmental factor, seen in the literature as having the potential to impede provision of an e-working definition, is central to the reality of working with technology. Embracement of development contributes to terminological longevity. It also heightens awareness of new or innovative practice; including ways of culturing and sustaining the relationship between the worker and the technology made available to them. Thus, in brief, *e-working is a way of being a worker as well as a way or a mechanism for carrying out the work task.*

METHODOLOGY

In examining the relevance of the e-working definition to education sector personnel, use was made of qualitative data gathered from education professional users of the social media site Twitter. These professionals had been asked to reflect on their use of Twitter in a professional capacity, for example to satisfy continuing professional development (CPD) needs. Twitter postings directed participants to an online questionnaire, thus establishing a measure of competence in the use of technology. Limiting the analysis to those who demonstrated some ability to use technology was not regarded to compromise the study since the purpose was to establish the relevance of the e-working definition to the educational context - as opposed, for example, to the extent to which individuals perceived themselves to be e-workers.

In total 144 questionnaires were analysed. 70% of the questionnaires were completed by female participants, 28% by male participants and 2% by those who declined to identify their gender. In each of the two main categories the age span ranged from the 20s to the 60s, with 43% of participants falling into the 40-49 age bracket. Criteria for selection of the questionnaire from the total volume returned was simply that the participant identified themselves to usually be employed in the education sector. This allowed, for example, the inclusion of 'freelance' or 'supply' teachers who are reasoned to play a role in the life of many schools but bring with them perspectives potentially unencumbered by a single teaching base.

FINDINGS

The way of being the worker

The data indicated an awareness that technological media is subject to development. A male secondary teacher described this, for example, as enabling him to 'be at the cutting edge of new or innovative practise', whilst a female Assistant Secondary Head identified that as a consequence of developing skills in handling technological change this had encouraged her both to support and embrace in-school change. Underpinning a number of the comments was indication that engagement with technology flagged up the need for other changes in working practice. However bridging a link between being a user of technology and other roles was not seen as always being straight-forward. A male Subject Director highlighted, for example, the need to be 'very disciplined and prepared to find ways of filtering out the noise'. Relating to this noise theme, was mention of technology having the potential to exacerbate some of the uncertainties surrounding current roles. Whilst this did not always appear unwelcomed, associated anxieties were highlighted.

The presence of technology was suggested to offer an additional mechanism for communication. A primary teacher identified she had tried to use technology to supplement face-to-face communication but that some of her efforts had been thwarted by the attitude of her school colleagues. She emphasised that whilst communication using technology lacked some of 'the niceities associated with face-to-face discussions' it facilitated 'information being distributed and made for a more effective way of working'. However the data also revealed others suggesting that their experience of technology was that it resulted in a compromising of effective management communications and led, in the words of a female Teacher of History, to 'managers hiding behind their computer'.

The data also evidenced there to be an awareness of the consequences of engaging with technology. A female Year Leader, for example, highlighted that 'using technology beyond the bare minimum shows that it interests you'. This demonstration was regarded to be important. "Educators are grounded and encouraged by sharing practice and views. We energise each other through sharing. If the technology doesn't facilitate that sharing then it risks compromising the spirit of education" (Head of Geography).

The way of carrying out the work task

There was some identification that technology has the potential to impact upon the creativity attached to the role of the professional educator. As a male Subject Head identified, "it can be constraining. You do things in a certain way because that is how [technology] drives you to act". Likewise, a female Secondary Teacher suggested that the technology did not always lead her to actions which she felt 'epitomised good practice or ideas'. This noted, not all the responses indicated the presence of an innate acceptance of limitations. A male Science Teacher, for example, recounted being shown how to use the technology which his school had

purchased and how he had then set about identifying more effective ways of working with that technology. The ability to "adjust working practice to fit with the learning expectations of a teaching role" (Assistant Primary Head) was likewise indicated.

Also identified amongst the responses was some awareness that the use of technology requires skills which may be different to other elements of the teaching role and that changes in working practice may well be a consequence of the increasing use of technology. There was, for example, regular use of phrases such as 'the knock on effect'. Likewise there was regular mention of concise working practices. The indication was that technology offered time saving potential and that time could, in the words of one female Primary Teacher, "be reinvested into other elements of the teaching role". However it was also acknowledged that the likelihood of time being freed up could result in a tendency towards 'work being done at the last minute' (Male Secondary Teacher).

The potential to use technology in order to gain credibility with 'digital native' students and, in the words of a Secondary Assistant Head, "bridge the gap between the classroom and the world outside school" was highlighted. The ability to evidence industry competence was also raised. Furthermore, being seen to use technology was also suggested to 'have the potential to support colleagues' (Female Primary Teacher) in that it provided a role model.

Some individuals highlighted being on the receiving end of covert pressure to engage with technology. However a frequent sentiment expressed was that once initial resistance had been overcome, the potential for technology-related solutions was actively sought. One Headteacher, for example, highlighted he "increasingly used technology to support other elements of [his] role e.g. Google apps, calendar, email and shared documents".

DISCUSSION AND CONCLUSION

The data highlights there to be a relationship between the way of being a worker and the way or mechanism for carrying out the work task amongst the participants drawn from the educational sector. Since a link between role and mechanism has been embraced in technology related studies involving students (e.g. Acikalin, 2010; Arslan, 2013; Liu and Lee, 2013), this relationship should, perhaps, not be a surprise. By extrapolation there is also acknowledgement that use of technology involves consideration of the worker as an individual; identified in the literature in terms of being a 'social' element. Again, with regard to educators facilitating student development, this has also been acknowledged (Aksal, 2009; Ilin, 2013). The question which arises is why principles used in teaching practice have not been so openly acknowledged in relation to the educational professional's role?

The data highlights that in the experience of the technology using participants drawn from the education sector, the way of being the worker embraces the developmental influence of technology as well as the implications of technology's presence. These implications include the impression cultured by the use of technology as well as the influence on the worker's practices. The way of carrying out the work task has a relationship with the creativity deployed by the professional educator; professionals within the sector being acknowledged to have strong capabilities with regard to technological integration (Baran et al, 2011; Isman, 2012). Furthermore, whilst skills deployed in using technology have the potential to differ from those which may be used in other elements of an educator's role, these need not be stand alone but, instead, have the potential to enhance other role-related capabilities. Other studies have similarly identified the adaptability required by technological usage being linked with employment sector retention (Omar and Nordin, 2013).

Thus in examining the relevance of the definition of e-working which provides that *e-working is a way of being a worker as well as a way or a mechanism for carrying out the work task,* it is seen that the definition has clear potential to be applied within the education sector. Indeed it would appear that it is not the composite elements of the definition which may appear alien to the worker in the educational context but instead inference drawn from the way in which the e-working term has hitherto been regarded. As elsewhere, the absence of a clear definition for the term may well have resulted in presupposition that e-working is largely an irrelevance; the manifestation of Barley's (1990) 'analytic abstraction' where credibility has been forfeited as a consequence of the favouring of traditional mechanisms. The effect is an extension of the presence of ‘assumption’ (Woolgar et al, 2009) which, risking disruption of the old order (Shuen, 2008), might well have been cultivated - either purposefully or through default.

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