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**Delivering the future workforce: A
highlighting of the need to focus on the
relationship between school teachers and
technology**

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Abstract

Drawing on an examination of the research literature and centring a debate around three main themes - (i) the nature of the school teaching role with a focus on stress and modelling, (ii) the role of government and the influence of globalisation, and (iii) the effect of technological competence (with social media examined as an example of that competence in action) - this paper highlights the need to focus on the relationship between school teachers and the technology that is available for use. From the base point of acknowledging the role played by the school teaching community in delivering the future workforce, and highlighting the potential for an understanding of the nature of the relationship between school teachers and technology to have an impact beyond the profession's boundary, this paper identifies that there are significant gaps in the understanding of that relationship and that those gaps have resulted in some compromises being made. Existing use of technology within the school teaching community is noted, along with acknowledgment that it need not be a positive relationship which exists between school teachers and technology. The ever changing nature and capabilities of technology are highlighted as having an influence on the relationship.

Keywords

Teaching role; government, globalisation, future workforce, technological competence, technological relationship.

Introduction

The school teaching community plays a significant part in delivering the future workforce. Indeed Sanders and Horn (1998) indicate the school teacher as being the single most important factor in determining student success; that success influencing student career aspirations. The influence of the school teacher stems from a number of angles, including that of the role model as well as the role played in supporting the student to acquire knowledge. Yet even in an age of decreasing resources and increasing demands, when the presence of technology is suggested to be the cause of, as well as a panacea for, many of the difficulties being encountered, it appears that limited focus has been placed on the nature of the relationship between school teachers and the technology that is available for use.

As the precursor to identifying the nature of that relationship, an examination of the literature in relation to influential factors was conducted. Drawing on that literature, this paper considers three main themes; each an influence on the school teacher. These themes are: the nature of the school teaching role with a particular focus on stress and the role model; the role of government and the influence of globalisation; and the effect of technological competence, with social media examined as an example of that competence in action. The purpose of this paper is to raise the significance of considering, both at a practical and at a theoretical level, the nature of the relationship between school teachers and the technology that is available for use.

Stress in the school teaching role

Citation

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The literature highlights that there are numerous forces which exert an influence on the school teacher. These forces include the indirect effect of those working alongside the profession, such as the support staff from whom school teachers are required to earn respect (Henry and Vilz, 1990; Hammett and Burton, 2005), as well as more direct influences such as those which result from the model of teacher training undertaken (Valkova and Gorny, 2013; Jarvis et al, 2014) and the nature of the support networks which contribute to teacher resilience (Nagel and Brown, 2003; Botwinik, 2007). School teaching is often talked about in terms of being 'a calling'; explained by Lobene and Meade (2013: 510) as being 'when an individual attempts to make the world a better place and experiences personal fulfillment through his or her work'. That fulfillment is influenced by the context in which the teaching role is carried out.

With this emphasis on internalising the school teaching role, it is not surprising that the literature should emphasise the negative influence of stressors. Stress is often highlighted (e.g. Hepburn and Brown, 2001; Richards et al, 2014a) as being the consequence of increasing demands and changed expectations. Furthermore, stress is suggested to be disproportionately high within the teaching profession (Nagel and Brown, 2003; Lhospital and Gregory, 2009). The education literature includes specific mention of stressor trends, with some effort having been made to track stressing influences. There is argument that an enhanced awareness of stressors is the consequence of changes made to mechanisms for communication. Since technology plays a role in facilitating that communication, for example through the presence of social media platforms, the effect of the technological presence has a compounding, if not an immediately apparent, influence. Where technology induced stressors are highlighted in the literature, these tend to be in the context of other role changes. However the focus on these other changes may serve to conceal the extent of technology's influence. Richards et al (2014b: 384) write about role changes in terms of them being 'internalised or externally enforced expectations' of the teaching context. Where expectation is present, then inevitably this channels focus and risks the influence of contributing factors being overlooked. A similar effect is seen where there is a requirement to fulfil a role model.

The school teacher as a role model

From time to time the school teaching profession finds itself being berated for failing to produce a workforce with the required skills. This is a popular occurrence within the tabloid press. In contrast, the education literature tends to take a more expansive stance in its handling of the generating of a workforce, as is seen for example in its focus on generating 'productive citizens' (Stallings, 1995). Linked with this material is the debate which surrounds whether it is the acquiring of skills, or the honing of the ability to develop skills, which should be regarded as significant in the school setting. Some writers contending with this issue have focused on an enhancement of student lives debate (Hook, 1997; Milner, 2014), explaining, for instance, that classroom learning offers 'space for experience' (Leatham and Peterson, 2010: 99). This experiential dynamic looks at the task of preparing the workforce with an entirely different lens to that which surrounds the more prescriptive teaching approach. Furthermore, it is a dynamic which both responds and has a parallel to the ever-changing nature and capabilities of technology.

Even though, as Cooper et al (2015: 1) highlight, 'student failure is not the teacher's fault' providing the teacher has created 'an instructional environment that provides every possible opportunity for student success', there is acknowledgement (e.g. Sanger and Osguthorpe, 2011) that school teachers retain a moral responsibility for ensuring student achievement. The literature places weight on this being a responsibility where success is heavily influenced by the society within which those students are growing up (Werfhorst, 2014). Whilst technology has the potential to expand the boundary of that society, for example through the potential for online interaction, exposure to technology related opportunities vary. Caution in the use of technology within the school setting, for example through a locking down of the internet sites which can be accessed via school networks, is readily

acknowledged. However this may not reflect the approach taken beyond the school gates. Furthermore, technological understanding is not simply a matter of being able to 'surf the web', upon which much technology related debate focuses, but relates to embracing the capabilities of both technological hardware and software. Society may, or may not, have exposed students to opportunities, such as those with a technology related underpinning, and the result may or may not have been positive. In considering school teacher role modelling, it would be as misguided to assume that any student cohort has an equivalent level of technological understanding, as it would be to assume that all school teachers regard technology in the same light.

Many of the difficulties highlighted in the literature as surrounding school teachers' support of students to acquire knowledge stem from the operational environment. These include, for example, the influence of budgetary constraints impacting upon staffing levels and resources (Burrack et al, 2014), the effect of trends in the approach to teacher training (West, 2012), curricular expectations (West, 2012) and significant use of student testing (Milner, 2014). These factors are interlinked. But it is the budgetary link which is particularly ironic. Ives et al (2013) highlight the impact of the global economic crisis on teaching budgets. If it is being argued that there is a link between school teaching and the delivery of a workforce capable of achieving success in a global economy, then in making those budgetary reductions the capacity to respond to the needs of the global economy is being automatically thwarted. Aside from the expense of developing and maintaining the technology using expertise of the school teacher in order that this might feature in their role modelling activities, the provision of technology and efforts to keep pace with technological change represent a significant expense. That governments have an influence on the school teacher's relationship with technology is thus apparent.

The role of government

Contesting of educational benefit is evident in the government influence. In a bid to show a strong management stance, as well as responsiveness to the commercial and industrial sectors, particularly the perceived risk to economic growth and global competitiveness, governments are often cited (e.g. Morris, 2012; Mehta, 2013) as playing a role in directing what is taught in schools and how that material is delivered. The complexity of the governmental role, with innumerable lobbying interests exerting force, should be acknowledged. In undertaking their role, governments become embroiled in policy trade-offs. These are trade-offs which Werfhorst (2014: 127) identifies as surrounding the four central tasks of education - namely, the labour market, optimisation, equal opportunities and socialisation. These are all tasks with a potential technological association. There is a wealth of literature (e.g. Wright, 2011; März and Kelchtermans, 2013) identifying that both governmental decision making and the consequent governmental influence are value laden.

One stabilising influence on governmental change results from an awareness that at the point of delivery 'education policies introduced by national governments often lead to unintended side effects at the local level where they are implemented' (Wallace and McMahon, 1993: 303). These side effects are acknowledged to cause tensions (Chan, 2012). Furthermore, in an effort to avoid those tensions, policy is occasionally borrowed from other settings (Morris, 2012). This borrowing of policy serves to emphasise the influence of external forces and highlights the lessening of the control held by the individual school teacher.

A recent example of a government intervention, produced six months into the then United Kingdom Coalition Government's term of office and noted by a number of writers (e.g. Evans, 2011; Wright, 2011) as just one element in the history of educational change, was a White Paper entitled 'The Importance of Teaching' (Department for Education, 2010). The White Paper included suggestion of there being too broad a curriculum within UK schools, as well as problems with teaching quality. The Paper was open in highlighting that its agenda for change amounted to 'radical reform' (Department

for Education, 2010: 4). Furthermore, the Paper was argued to represent a central government power grab (Chitty, 2011); one that lacked 'awareness of the historical and social positioning of teaching' (Braun, 2015: 258).

'The Importance of Teaching' White Paper (Department for Education, 2010), is reported to have left school teachers feeling constrained in their work role. Thorpe (2014: 2) explains the approach to have 'treat[ed] teachers less like professionals and more like traditional blue-collar workers'. In exploring the impact of the White Paper and its focus on the training of school teachers, Chitty (2011: 13) highlights teacher training is being portrayed as 'little more than the acquisition of a certain set of rudimentary skills – and principally those related to behaviour management and the maintenance of good discipline'.

Constraint negatively impacts development within any role. This is, for example, exhibited through a negative influence on the embracement of skills, including those related to the use of technology. As a result, constraint might well contribute to diminished perceptions of professionalism in the sense of expertise, authority and being empowered to make judgement calls. However without an appropriate understanding of the relationship between school teachers and technology, this reasoning lacks the weight of evidence which might permit the profession to actively respond to that constraint.

The globalisation link

Globalisation, reasoned to be 'a key theme of contemporary international political economy' (Browne and Braun, 2008: 16) and credited 'with many merits and held responsible for many evils' (Cigno et al, 2002: 1579), is accepted to have had a significant influence on the requirements of the workforce. The literature highlights that many studies have been undertaken in relation to the significance of globalisation in the context of specific career domains, with examples including the law (Thornton, 2014), accountancy (Kamla, 2012), and the nursing profession (Callister et al, 2011). Furthermore, and as Sherwood and Shaffer (2014: 46) explain, 'balancing workforce supply and demand in a global economy is essential in order to prepare for and respond to emerging opportunities'.

Whilst the current wave of globalisation has developed since the mid to late 1940s (Artis and Okubo, 2009), the more recent influence of technology and developing technological capabilities has been significant (Docquier and Rapoport, 2012). The Organisation of Economic Cooperation and Development is cited by Bevin et al (2012: 9) as arguing that, 'Education and training are the essential factors when responding to the changes in technology and demographics that are currently defining future labour market demands'. Indeed, many sources (e.g. Duffy, 2014; Hsin et al, 2014) make mention of needing to train students at a young age to work in environments where technology is not just present, but rapidly changes. The role of the school teacher is thus identified to be pivotal.

Some of the urgency associated with this developmental need relates to a regularly presented argument (e.g. Nissanke and Thorbecke, 2006; London and Schneider, 2012) that globalisation has the potential to accelerate inequalities as a consequence of the wherewithal to take advantage of changed and changing operational conditions. This explanation is associated with 'an enhanced global consciousness' (London and Schneider, 2012: 247); an awakening to the presence of difference as a result of a more informed approach to comparison.

The literature highlights that the circumstances arising from the presence of globalisation are not always acknowledged, nor effectively managed. Here the span of the management influence flagged up within the literature is of note. At one extreme is the governmental role which is

highlighted to be fuelled by the fear associated with being 'left behind' in a globalisation race. Dominelli (2010: 601) provides example of the effect of that race in her highlighting of the influence of 'the digital divide'; identifying the exclusion which has the potential to arise from rapid technological change. At the other extreme is a focus on the worker's day to day setting. Here consideration of the influence on the teaching role of management within the school setting is appropriate. The relationship with technology of those in school management roles has ramifications for the school teacher working in that context. If a teacher is perceived as having a negative relationship with technology as exhibited through limited technological competence, is this impression the reality, or simply an illusion generated by the context in which that teacher is required to operate?

Technological competence

It is acknowledged that technology related wherewithal, similar to other capabilities, vary within the school teaching profession (Aduwa-Ogiegbaen, 2009; Buchanan, 2012). Indeed, it is not inconceivable to suggest that this diversity has hindered examination of the nature of the relationship between school teachers and technology that is available for use.

Within the body of literature related to the use of technology, Ertmer et al (2012: 423) cite earlier work (Ertmer, 1999) in highlighting that it is second-order challenges which present the most significant barrier to the school teacher using technology; these barriers include 'teachers' confidence, beliefs about how students learn, as well as the perceived value of technology to the teaching/learning process'. Emphasis on 'second-ordering' indicates the likelihood that greater focus has been placed on first-order barriers, 'defined as those that were external to the teacher' (Ertmer et al, 2012: 423). The ordering analogy emphasises that use of technology is not the only demand placed upon school teachers, and that engagement with technology may not have been ignored, simply discounted on the basis of historical assumptions surrounding priorities. Indeed, where a broader focus has been placed on technology and its use, there has been questioning surrounding the exhibition of compromised espoused and enacted beliefs (Berg et al, 1998; Ertmer et al, 2001); for example the difference between saying and doing. This compromise will inevitably have presented difficulties at all levels of educational leadership.

Reports from school teachers of difficulties in delivering the expanding requirements of their existing role are not unusual. Such difficulties are suggested to be a consequence of policy decisions which teachers are required to enact (Zembylas et al, 2011); the result of career transitioning (Fresko and Nasser-Abu Alhija, 2009); and the effect of the social circumstances encountered by their students (Lovitt, 2010). However the literature does present argument that some school teachers consider continuing professional development (CPD) to provide an unwelcome additional burden (Hustler et al, 2003; Hobson and McIntyre, 2013). Use of technology can be paralleled with CPD in the light of its developing and unrelenting capacities. Furthermore, it may well feature as part of that CPD activity. Mindedness of the perception of burden appears to have influenced arguments presented (e.g. British Council, n.d.; GTC Scotland, 2013) in relation to how CPD engagement can be maintained.

Whilst an inherently negative parallel between burdensome CPD and the development of technological competencies should not be assumed, the literature does highlight issues which may be significant to this perspective. Alexander and Henderson-Rosser (2010) note, for example, that CPD provision has the potential to interfere with other plans that have been made to use the available time. Furthermore, there is a suggested association between a reluctance to engage and school teachers being continually asked 'to do more and more' (Fresko and Nasser-Abu Alhija, 2009: 319); one of the more regularly identified stressor factors. Indeed, increased technology related

capabilities, consequent to engagement with development opportunities, may be perceived as presenting an individual as ready to embrace, even seeking, further expansion of their job role.

Cordingley (2003: 6) writes of CPD having 'the power to symbolise the importance of learning'. Avoidance of CPD engagement generally, and technology related CPD specifically, is contrary to a positive perception of the school teacher fulfilling a role (or fulfilling the function of a role model) in the increasingly globalised world. One mechanism for resolving this perception of burden is to look beyond a simple expectation that professional development opportunities, particularly CPD where technology plays a key role, will be undertaken and the learning implicitly utilised. It is difficult to refute that this would be easier to manage if there was a clearer understanding of the relationship between school teachers and technology that is available to use.

The example provided by social media

Akin to the discussion surrounding the school teacher as a role model, the influence of motivation in stimulating student activity is well documented within the literature. Brooks and Young (2011: 48) cite Pintrich & Schunk (2002), for example, in highlighting that 'student motivation is an important precursor to learning, and therefore, is a meaningful aspect of any successful classroom experience'. Focus on the motivational potential of technology in the teaching role receives less attention. It is, however, within this lesser body of material that some evidence of the motivating potential being derived by teachers from social media is seen. In relation to the Twitter platform, for example, teacher tweeters have claimed ideas are sounded out, resources are shared and a feeling of mutuality is garnered (Beadle, 2014). Furthermore, Chen (2015) argues that Twitter is the most likely social media platform for the sharing of informative facts. That the Twitter platform has the potential to be used as a teaching tool has also been noted.

There is identification that online attachment motivation and online relationship commitment influence online knowledge sharing (Ma and Chan, 2014); what can be thought of as the individual experiencing an obligation to make contributory acts and receiving some form of response as a consequence. This mutuality echoes the effect of social pressures noted more broadly as existing amongst student cohorts (Moss et al, 2014). The term digital native is generally accepted to refer to 'native speakers of the language of such digital technologies as computers, mobile devices, and the Internet' (Teo et al, 2014: 1). However, use of that term originally held an age association and some of this legacy may still be present within the teaching profession. Here there is suggestion that the term tends to be discounted on account of individuals having developed their technology related competencies since qualifying as a teacher.

Whilst some skill and interest in using the platforms which support a social media presence has been identified within the teaching community, the literature fails to reveal why a significant proportion of school teachers are not actively embracing social media's potential. That understanding could arise from examining the relationship between school teachers and the technology that is available for use.

Emphasis on the relationship between teachers and technology

This paper has identified there to be significance in examining the relationship which exists between school teachers and the technology that is available for use. In doing so it has highlighted the sizable gaps in the existing understanding of that relationship; gaps which have, furthermore, the potential to impact upon effective school management.

It has been indicated that the relationship between school teachers and technology may not be entirely positive. It has, for example, been noted that technology has the potential to contribute to the presence of stress, not least through a demanding CPD requirement, and that keeping pace with

technology's rapidly changing capabilities demands a significant budgetary investment. However, the outfall of the gap in understanding has contributed to compromises being made. Furthermore, this paper has highlighted that there are some questions surrounding an affinity with technology related terminology, such as the digital native term.

It might well have been the risk of evidencing these negative factors which has had an influence on those with a passion for the use of technology in the school setting and which may have caused them to avoid exploring the identified relationship focus. Indeed, it might well be easier to avoid exploring that which may challenge the preferred way of thinking, even when those individuals have found themselves to be frustrated by being on the receiving end of a similarly limited cognitive approach. By way of example, it has been mooted that a response to the issue of professional constraint, both within the teaching profession generally and within the school setting specifically, may have been derived from an enhanced understanding of the relationship with technology.

The ever changing nature and capabilities of technology have been noted. The influence of technological change, and in particular the difficulties this presents for deriving substantiated conclusions, is acknowledged. Yet as well as changes in technology being highlighted to define future labour markets, that technology is a current factor within the lives of many students. Indeed, many students demonstrate significantly greater competence in the use of technology than they see being modelled by their school teachers. This offers an example of the inequalities identified to derive from the changed and changing operational conditions in the globalised workplace. Furthermore, it can be questioned whether this variance between student and school teacher, extending as it does the noted variance between the technological capabilities held within the teaching profession as a whole, is serving to perpetuate the noted gap in the understanding of the relationship of school teachers and the technology that is available for use.

The argument presented by this paper has focused on the teaching profession. It is not suggested that this gap in understanding is limited to the educational community alone. However, acknowledging the aforementioned role modelling expected from school teachers, a redressing of this gap does have implications for the understanding of the technology relationship more broadly.

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