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The social construction of time in contemporary education: implications for technology, equality and Bernstein's 'conditions for democracy'

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ABSTRACT

This article discusses how the introduction of technology has led to a fundamental shift in the relationship between education and time. As a means of analysing the extent of such changes on pupils from different backgrounds, I use Bernstein's 'conditions for democracy' as a framework for evaluating the impact new understandings of time in education are having on disadvantaged social groups in England. I conclude that Bernstein's framework presents a useful way of illuminating the complex interplay of personal agency and the external environment. Consequently, here we see that new definitions of time in education, specifically with regard to synchronous versus asynchronous learning, have resulted in new inequalities for those in deprived areas.

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Introduction

The role of time in school is often taken for granted, but as argued previously (Leaton Gray 2004) it represents a highly structured and stratified element of social relations laden with meaning. In school, time forms a crucial framework within which pupils and teachers negotiate social status, locate social and cultural practices, and mediate mechanisms of power and control. However new technologies of education are rapidly beginning to disrupt these finely tuned aspects of institutional life, leading to new forms of learning that are taking place at self-determined times outside the classroom. These new forms of learning are in contrast to more traditional forms of learning that take place within classroom and timetable-based models. The first form of learning could be classified as 'asynchronous', because it stands outside what we might call classroom time, not requiring teacher and pupil(s) to be in a room together or to work to a set timetable of deliverables such as homework. As such, social co-presence is not required. The second form could be classified as 'synchronous', because it does require teacher and pupil(s) to be in a room together or to work to a set schedule, with social co-presence being essential. Synchronous learning therefore stands within classroom time. This article begins with an extended review of what is a relatively neglected body of literature. The article then draws upon this to investigate, through a Bernstein-type lens, whether and how such changes to the external environment are likely to have consequences for the effective delivery of school-based education in the future. It also considers whether changes will affect social groups differentially, if there are inequalities in the locally available infrastructure. In this way, the article offers a new conceptualisation to help us visualise more clearly how new technology is affecting time in schooling.

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The article begins by critically reviewing the comparatively sparse literature on time in education, before discussing a number of different aspects of time as they traditionally have related to schooling:

- different definitions of time – fixed, biological and social;
- the relationship of time to social status;
- time as a commodity;
- time as expressed in terms of education policy;
- time in the curriculum;
- time as a mechanism of social control; and
- the relationship between time and social identity.

The article then examines whether these conceptualisations of time within school-based education are being affected by the introduction of new technologies, particularly the introduction of high-speed broadband and social media. In the light of these changes, there seems to be a fundamental tension emerging. The tension is between the traditional delivery of education via the school settings with which we are all familiar (classified earlier as synchronous) and the increasingly social learning environment that has developed around pupils over the last three decades (classified earlier as asynchronous). Here, social learning represents learning well beyond the types of group work pupils may have previously experienced at school. Instead it involves sharing online space with anonymous learners around the globe not otherwise known to the pupil.¹ Using Bernstein's framework for 'conditions for democracy' as a lens to interrogate these changes, the article makes an original contribution by considering the way increased inequality for learners results from these new time relationships. It applies particularly where some do not have access to adequate technological tools and infrastructure. New time relationships also represent a form of social control of learning that is undesirable.

Earlier studies

The social construction of time is a significant aspect of the social world but one that has not been explored extensively in relation to education. There is a substantial literature relating to society and time in general, as can be seen in the work of Sorokin and Merton (1937), Adam (1990, 1995), Brannen (2002), Brannen and Nilsen (2002) Petrie (1996), Roth (1963), Green (2002), Novotny (1994) and Cipriani (2013), to mention a few of the key contributions of relevance here. These studies have found that time can be classified and perceived in different ways, and that technology has increasingly had an impact on how it relates to society. In terms of the relationship between time and education more specifically, the article also builds on earlier work which discusses the rhythm of the school year and its relationship to former agricultural and ecclesiastical timetables (Leaton Gray 2004). The article also builds on Bernstein's concept of 'time, text and space' (Bernstein [1996] 2000). Finally, it draws attention to the literature surrounding the social implications of mobile technologies in relation to time (Green 2002).

We therefore see a significant shift in the way society understands and uses time, which needs careful and detailed explanation. Traditionally the concept of time was regarded as a fairly simple one. In many ways, school life still reflects a simplistic model, based as it is on the agricultural and Christian calendar prevalent during the mid-nineteenth century, when universal schooling was first introduced in many Western European countries. Since then, however, the role of time within society has become increasingly more complex. Time is measured and experienced by people in different ways, what Novotny (1989) might call 'multiple temporalities'.

In this article, therefore, we are looking at how time impacts on different aspects of schooling, especially in relation to technological developments, and how relevant social meaning is derived. This is an important aspect of seeking to understand education in the modern world. Indeed, Bernstein ([1996] 2000) argued that the role of time within any pedagogic discourse is crucial. Examining time is important in understanding the impact of new technologies on learning, as well as understanding pedagogic practice.

This article assumes three main categories of time derived from the literature, which will now be described for the purposes of completeness. The first category is ‘fixed time’. This is the notion of time as ‘clock time’, ‘calendar time’ or ‘atomic time’. In this definition, the former two types are dictated by planetary movements, with the latter dictated by physical ones. We use precise metrics to measure fixed time. Here we see that a day represents a 24-hour rotation of the earth on its axis, and a year represents 365.25 days, or the equivalent of one rotation of the earth around the sun. The lunar month represents 28 days, or one rotation of the moon around the earth. This is also called ‘anthropological time’ by social anthropologists such as Levi-Strauss (1962), Alexander (1995) and Gellner (1992). Indeed, Gellner describes this form of time as ‘a train travelling across a faceless landscape’ (Gellner as cited in Leaton Gray 2004, 2), because time would have had little meaning for pre-modern societies apart from these significant cosmological punctuation points.

The second category is ‘biological time’. Here, chronological age can be considered a basis for ascribed status. Examples might be a child’s transition to secondary school at age 11, 13 year olds being able to have their own Facebook pages, pupils choosing options for higher level study at age 14 or 16, and so on. Bernstein ([1996] 2000) also talked about the idea of the ‘symbolic ruler’ in terms of time, with children being classified as being ‘ahead’ or ‘behind’ depending on their progress in relation to their biological age. He described time as ‘wholly imaginary and arbitrary’ ([1996] 2000, 35).

The third and final category is ‘social time’. While the idea of a day is cosmological, that of an hour and a week are determined by human society, what Durkheim called ‘social fact’ (1982, 50–59). Therefore the idea of a school term and weekly timetable is socially constructed, as well as the division of a day into lesson slots. As Sorokin and Merton explained in their seminal article on social time:

Quantitatively equal periods of time are rendered socially unequal and unequal periods of time are socially equalised ... social time, in contrast to the time of astronomy, is qualitative and not purely quantitative; that these qualities derived from beliefs and customs common to the group and that they further serve to reveal the rhythms, the pulsations, and beats of the societies in which they are found. (Sorokin and Merton 1937, 623)

It is therefore clear that there is a long and complex literature to do with the sociology and anthropology of time, often overlooked in some forms of social research. Some areas are particularly well covered; for example, the way time is perceived by different people in different situations, and the impact that technology might have on changing the relationships between people and time. However, there is significantly less published literature in the area of time and education, and the role of technology as a disruptive influence. Another lacuna is the role of social class in determining the ability of young people to manage time well and consequently achieve good levels of educational attainment. This article therefore draws upon this somewhat neglected literature to examine social time in schooling, with particular reference to contemporary technology and the impact of social class – and it is here that the article seeks to make a distinctive contribution.

Social time and status

Bearing in mind the outlined different classifications of time, a number of options are therefore open to schools when deciding how best to arrange learning. Schools frequently decide to privilege what Green, drawing on earlier work by Giddens (1990), calls ‘durable co-present interactions’ (2002, 249). Here this means a stable and permanent model of a behaviour type, such as sitting in the classroom listening to a teacher, for example. This is in contrast to an alternative model, what Green classifies as ‘fragmented and disconnected spatial and temporal connections’ (Green 2002, 282). Here such behaviour might be represented by mobile or online learning that was entirely student directed and/or student led.

Such a widespread preference for the first model tells us that schools place great store on the timetabling and structuring of learning. They ascribe high status to learning taking place in this context, representing a form of ‘sacred knowledge’ if we are to borrow from Durkheim (1915).² Yet the relatively disconnected *ad-hoc* learning that may take place on smartphones and via social media is to a large extent discounted, or at most seen as peripheral to the carefully curated and organised

school experience. In other words, this type of learning is similar to Durkheim's concept of 'profane knowledge'. However, in terms of increasing overall access to knowledge, it is crucial.

Having considered these three alternative definitions of time, we begin to see some of the intricate power structures (in other words, the decisions that schools make about the status of different types of learning) that underpin the transmission of knowledge within society. For a full understanding, however, it is first necessary to define different aspects of time more specifically within the context of schooling.

Different aspects of time

This phase of the article analyses and categorises the role time plays in schooling in a more detailed sense, drawing on examples from everyday institutional practice.

Social time and rites of passage

Societies use different techniques and rites of passage to mark the passage of time – for example, rituals (such as graduation ceremonies), life cycles of different people and groups (say the Class of 2015, or transitions from primary to secondary school). These often indicate a shift from one status to another.

In anthropological terms, there are specific stages to any rites of passage (Van Gennep 1960). For example, during secondary school transition a pupil may experience a visit to the new school with his or her class. He or she might perhaps spend a day there, and in anthropological terms the visit would be classified as a rite of separation. During the summer holidays immediately prior to secondary school entry, the same pupil may be bought a school uniform, a scientific calculator or a mobile phone that he or she may not have needed to own in primary school. Here, the summer holidays represent a liminal state, or the boundaries between two educational stages. Finally the pupil might go on to join the new school and experience an induction, what would be classified in social anthropological terms as an incorporation.

These rites of passage are clearly demarcated and recognisable to parents and others who have attended school in the past, and are anticipated by younger children as they look forward to the future. Bernstein went further than simply creating categories for rites of passage, as used earlier, and classified such ritual aspects as a form of symbolic control ([1996] 2000, 98). Consequently he developed two sub-categories: open, where ritual order is inclusive and non-hierarchical; and closed, where ritual order celebrates hierarchy and dominance. In other words, we see that ritual order can determine whether institutions are focused on bringing people in or leaving people out, which is a key concern of this article.

Time as a commodity

Time can also be a commodity in school. The use of bells is still ubiquitous in secondary schools to mark the end of lessons, as is the use of whistles in physical education lessons. They resemble power hierarchies that were first evident in the post-industrial revolution factory. Time has currency for pupils and teacher. For example, misdemeanours are paid for by detentions where pupils stay back after school or in their lunch hours to complete extra work, and time limits are set for the submission of course work and the completion of examinations. There is a lexicon of saving and investing time; for example, 'spending' time on homework. These mechanisms all represent what Massey would call 'power geometries of time' (1993 as quoted in Green 2002, 288) and where the idea of Bernstein's ([1996] 2000) closed order is once again relevant. Some pupils are going to end up with more time than others for pursuing their own scholastic interests.

Sensing the speed of time

Writers such as Virilio (2000) and Levi-Strauss (1962) have commented on the passage of time and how it can vary. For example, in education we can usefully apply the concept of ‘hot chronology’ and ‘cold chronology’ (Levi-Strauss 1962), where the term ‘hot’ indicates high complexity, combined with lots of rapid changes and events. This is in contrast to the concept of a ‘cold’ chronology, which indicates a simpler social experience, with a slower pace of change and fewer events.

A good example in the context of education might be a head teacher taking over a failing school, who then invokes the need for a ‘hot’ chronology to give the impression of action. Such an approach can be exacerbated by technology, giving us what Virilio (2000) would describe as an intensification of more and different activities of shorter duration, as communication is fragmented into multiple forms. Each of these forms of communication is likely to have a shorter duration, with parents receiving daily emails, online school reports and schools frequently updating web pages and Twitter feeds. Townsend (2001) calls this ‘speeding the metabolism’ of a system.

Yet despite the fact that speeding up communication is seen as increasingly central to the public relations and administration function of the school, in some classrooms it is still unacceptable to use mobile technologies in such a way. It indicates a disconnection between pedagogic practices and social change. Technology can also play a part. Some schools, particularly those in deprived areas as well as those located in areas that find themselves some distance from a telephone exchange, experience that a lack of infrastructure such as high-speed broadband means it is difficult or impossible for schools or pupils to play a regular and useful part in the intensification of activity (BBC 2014). In this way we see examples of inadvertent or indirect social disadvantage, something which is discussed in more detail with reference to Bernstein’s work later in this article.

Time and the curriculum

There is frequently a relationship between subject status and the time allocated on a school timetable; for example, mathematics gets more periods allocated than wellness, in many cases. Time is also used as a proxy for difficulty. For example, we see the provision of two-hour, four-hour or six-hour mathematics courses in the *Scholae Europaeae*, which are the official schools of the European Union for the children of officials (including UK pupils). In these schools, the number of hours a subject is timetabled for is taken to indicate both the difficulty and the status of the course within the larger European Baccalaureate final examination. Therefore if you study on the ‘six-hour’ course, you are seen as an elite mathematician.

Such a classification represents a reification of time as though it was a reality rather than a symbol (Elias 1993). Development of online learning courses can disrupt such processes. This is because courses can be allocated notional hours but implementation can then vary greatly, according to the needs of the pupil. Online learning can therefore represent an example of a decentralisation of activity, because learners organise their lives in a newly mobile way where the functions of time and space are a secondary consideration. This phenomenon has already been seen in the case of office workers subject to new forms of office technology and automation (Laurier 1999).

Paradoxically, many elite subjects sometimes demand supplementary time outside school via extra-curricular activities (examples of these being music, drama and elite sports training). The ability to pay for the coach’s time, and organise the self in order to take advantage, are central to success. Here we see another example of ‘power geometry’ in action (Massey 1993). Who has access and who has control of time, and who does not, gives us an indication of the social situation, and once again, Bernstein’s ([1996] 2000) concept of a ‘closed order’ has some relevance here.

The same might apply to teachers and their continuing professional development. If it takes half a day to travel to a subject refresher course, for example, travel time issues will restrict the ability of teachers in some geographical areas to take part, not to mention the ability to meet with fellow professionals (Leaton Gray 2005). Travel therefore represents a problem not experienced by teachers

in metropolitan areas to anything like the same degree. On the other hand, readily available transport, the provision of twilight (after-school) staff development sessions and reliable high-speed broadband supporting online communications have all been instrumental to educational change. In the United Kingdom, for example, there were particularly rapid rates of school improvement in the capital during the period of the London Challenge (Greaves, Macmilla, and Sibieta 2014), and it may be that superior transport and technological infrastructure were an important catalyst here, effectively privileging a metropolitan urban elite. Thus is urban time effectively rendered more valuable than rural time.

Time and the self

All of the aforementioned categories play an important role in how time is experienced by individuals at school, which can vary greatly according to a child's background. Bernstein considered one of the most important factors here to be social class. He considered that middle-class children were better equipped than working-class children to experience delayed gratification at school. In the following quotation, for example, he describes the relationship between time and the middle-class child:

Every item in the present is finely linked to a distant future, consequently there is not a serious clash of expectations between the school and the middle class child. The child's developed time span of anticipation allows the present activity to be related to a future, and this is meaningful ... the child is predisposed to accept and respond to the language structure of communication ... the school aims at assisting the development of consciousness of self, cognitive and emotional differentiation or discrimination, and develops and encourages mediate relationships. (Bernstein 1971, 29)

Social class clearly represents one aspect of an individual's experience of time, but it is somewhat simplistic to focus on it exclusively, as Bernstein does. It is more useful to look for more general links between social identity and time, as a means of understanding the habitual way social actions play out in real life. It may or may not be strictly related to social class in the way that Bernstein supposes. For example, whereas previously all pupils might have looked to a teacher or their school for guidance about social actions, such as when they might anticipate a reward for any effort expended, now the situation is changing. Instead of looking to the teacher or to the school quite so frequently, the individual becomes increasingly responsible for what Giddens describes as 'life-planning' (1991, 86–87) where personal control of time is a vital aspect of the post-modern self. Some children and young people are likely to be more successful at time management than others, depending on their mindset and state of maturity. As Giddens writes:

a teenager who 'drifts around', who refuses to think about a possible future career, and 'gives no thought to the future', rejects this orientation, but does so specifically in opposition to an increasingly dominant temporal outlook. (Giddens 1991, 86–87)

To make things even more difficult for the teenager with a predisposition to 'drift around', the contemporary emphasis on time management as being core to success at school has now been exacerbated by the introduction of technology. Pupils are increasingly likely to learn using tools of their or their parents' own choosing, under their own direction, with less teacher mediation/curation. This diversity of learning tools and approaches is contributing to the demise of a sustained collective narrative, meaning that age cohorts become increasingly fragmented in terms of their personal learning experiences and sense of identity. The teacher and school become less central to this process. It is not a level playing field, however. Without equal access to adequate technological infrastructure, developing the right learning patterns and an appropriate sense of self in relation to time management is therefore going to be significantly easier for some pupils than others. Better access to technology is clearly not necessarily always a precursor to better use.

Clearly there are social processes at work in relation to time and schooling that are radically changing the way children and young people learn, which also impact on their ability to access information and education. A key question for consideration is whether this shift is more significant than we have

previously thought. The next section therefore analyses the question of identity and digital engagement in more depth.

Asynchronicity and digital engagement

It is easy to dismiss many of the technological changes in education as being overstated. The concept of functional equivalence was used in the 1960s in relation to the introduction of television, for example, where it was argued that it simply represented a more efficient way of reading newspapers and attending cultural events (Weiss 1969). Similarly, today it could be argued that modern technology just represents a simple shift in delivery systems that allows a different kind of access to familiar material, but within familiar school systems surrounding its use.

However what we are seeing here is more likely to represent a significant shift in social structure, where time and space become abstract and cease to have meaning. This represents a form of compression, convergence and distanciation of time and identity (Giddens 1991; Green 2002). Here, compression means that time in school has become intensified and has lost its relationship with the clock; convergence means that boundaries between teachers and pupils, and between different areas of knowledge, are being eroded; and distanciation means that instead of interactions being face to face, they are increasingly becoming remote and impersonal. Knowledge no longer has to be experienced in a classroom, or a school library, curated by a teacher. It can now be posted online for pupils to call up at will, often in forms and at times of their own choosing, in almost any geographical situation. Pupils can also form *ad-hoc* social groups, which break the boundaries of age cohorts, institutions and even nation-states. Online, they can adopt new identities where they may be positioned alternatively as experts or ingénues, something which Carrington (2008) describes as a new model of childhood rooted in new forms of literacy that are primarily digital.

Within such a model, time is not conveniently sequential, and consequently time spent on academic activities or intellectual development is not easily verifiable by institutions. Here, the contemporary experience of knowledge acquisition sits a very long way from traditional transmission systems involving timetables and classrooms. Such a shift in time and space represents a new asynchronous ecology of learning, and one with which any relationship to face-to-face interactions within the classroom does not always sit comfortably in pedagogical terms. Time is no longer neat and orderly, but instead demonstrates social imperfections (Giesen 2004). Such a view of time as somewhat messy also disrupts our existing understanding of time in relation to education, which previously tended to focus on issues such as the impact of social class, as discussed previously (Bernstein 1971).

Inequalities of time/technology

As stated previously, the ability of children and young people to engage with education varies according to the tools and infrastructure available to them, and here we see the effect of disadvantage at work. In the early days of the Internet, there used to be a concept of the 'digital divide', which largely represented an urban/rural divide in terms of the availability of high-speed broadband, and to some extent good mobile phone signals allowing 3G and 4G provision. However, recent research now discusses digital differentiation, which is a more nuanced concept. It is not as simple as an urban/rural divide, and it also related closely to general use, markets and engagement patterns (Sinclair et al. 2007). It has distinctive geographies, and here rurality can sometimes (but not always) be a factor, as well as the distance from a telephone exchange (White 2013).

Of greater concern, however, is the fact that digital differentiation and poor infrastructure can often be seen to be co-morbid with poverty and deprivation. For example, 21.8% of households fell below the government universal service commitment of 2 Mbps in 2012/13, and if mapped by postcode it appears that many areas classified as deprived using the Government's Index of Multiple Deprivation also suffer from restricted access to high-speed broadband (Johnson 2014). They are effectively living life in the technology slow lane.

Other research shows that even in a relatively egalitarian society such as the Netherlands, adolescents' access to the Internet is structured socially (Peter and Valkenburg 2006), with those from affluent backgrounds using it more for information and education, as well as to build enhanced social networks through online communication. Those from deprived backgrounds, on the other hand, tended to use it more for entertainment. Therefore adolescents who are from relatively poor backgrounds living in deprived areas may be doubly disadvantaged, in that they have restricted access to technology as well as limited capacity or inclination for exploiting it educationally. Once again, access to infrastructure does not automatically equate with effective use.

To some extent such deprivation can be compensated for at schools, but slow networks there as well as competition for resources may inhibit availability (BECTA 2008). This is particularly relevant in terms of: revision and preparation for examinations; and games-based testing and practice of academic subjects (BECTA 2008). Both of these rely on self-directed, asynchronous online engagement with learning, and differential access is likely to lead to differential educational outcomes. For this reason, high-quality teacher–student interactions are key to ensuring a positive impact from using computers for education, so that maximum benefit is obtained (OECD 2015). The next question is how differential access to both infrastructure and teacher support can be seen as an issue relating to democracy, and it is here that drawing on the work of Basil Bernstein is most helpful.

Bernstein and conditions for democracy

In Bernstein's later work he outlined what he called 'conditions for democracy'. His aim was to offer a framework for examining education in order to identify and expose inequalities (Bernstein [1996] 2000, xix). Two key principles were embedded within this. The first was the idea of mutuality, where citizens felt there was a balance between giving and receiving (e.g. in relation to the state). The second principle was that if mutuality was difficult to achieve, there should be a good reason for the difficulty rather than any lack of achievement being purely arbitrary. As Bernstein translated:

Parents and students must feel that they have a stake in the school and confidence that the arrangements in the school will realize or enhance this stake, or, if not, good grounds are to be given as to why not. ([1996] 2000, xx)

He then moves on to describe three pedagogic rights:

- *Enhancement*, or the right to the means of critical enhancement. Bernstein defined this as a mechanism for seeing past and possible futures for pupils.
- *Inclusion*, which Bernstein categorised as taking place socially, culturally, intellectually and personally. He stated that he saw all these forms of inclusion as operating at a personal level.
- *Participation*, which Bernstein defined as the right to participate in procedures whereby order is constructed, maintained and changed, or in other words, civic practice.

Within these three categories we therefore see pedagogic rights as operating at a number of levels: individual, social and political. In *Pedagogy, Symbolic Control and Identity* ([1996] 2000), Bernstein goes on to apply the idea of pedagogic rights to schooling. He uses the metaphor of the mirror to show the questions that might be posed about a school's pedagogic ideology: who recognises themselves as of value? What is excluded? Whose voice is heard? Who is silenced? Asking these questions, argued Bernstein, allows us to determine the hierarchy of values embedded within a school. Bernstein equated these to class values.

We can now consider the issue of technology and education. The promise of technology is seductive for schools, and offers one reason why we have seen large-scale investment since the introduction of devolved school budgets since the 1988 Education Reform Act. To an extent, universal investment represents what Bernstein would call enhancement, especially as classroom whiteboards and school computer rooms are meant to offer equal access to all pupils. However, the potential for technology use lies beyond the walls of the school. As discussed earlier in this article, access to high-speed broadband varies regionally, for example, which means that some schools are able to offer more advantages to

pupils than others (BBC 2014). If we regard schooling as an issue of national, rather than regional, importance, then patchy provision of the resources children need in order to learn, both synchronously and asynchronously, would seem to be a prime incidence of lack of equality, as Bernstein would see it.

We come next to inclusion. Once again, key to inclusion is having access to the means to be involved. Such access can either be provided at a school level, and therefore be dependent on local infrastructure, or it can be provided by parents, who may be in a position to buy improved access – for example, by living in an affluent area with high-speed broadband, buying a smartphone for their child or buying him/her an up-to-date laptop or tablet computer to take into school, to avoid the need to share desktop computers. Access to all of these things allows a child to adopt what Bernstein ([1996] 2000) called a form of ‘prospective citizenship’, in which the child is seen as a forward-looking younger citizen and compliant with the dominant political message. Here the message is about technological literacy and bringing one’s own agency to bear on education. In the twenty-first-century technology arms race, children without adequate access to high-level technology become what Bernstein would call ‘retrospective citizens’, behind time and excluded from the mainstream.

Finally, we come to participation. Children able to enter the world of social media are also able to develop an online voice and presence in any way they wish. This can, of course, lead to problems in terms of child safeguarding, especially when children engage in practices such as sexting and undesirable forum interactions with strangers (Leaton Gray and Phippen 2012). However, it also means that children are able to forge new relationships and express themselves to a wider audience than ever before, especially if they have developed sophisticated digital literacies that enable such practices (Carrington 2008). Meanwhile, other children may be prevented from engaging online, perhaps through lack of access to infrastructure, as discussed previously, or perhaps as a consequence of parental or teacher nervousness. This difficulty can be compounded by a blurring between the different boundaries of power discourse in schools, leaving pupils unsure as to their status within the institution, perhaps trapping them within a particular social identity when it might be pedagogically advantageous to move towards a different one. Thus they are positioned away from the mainstream, and, in terms of social identity, behind time.

Conclusion and discussion

It is clear that the role of time and place within education is shifting, with opportunities for learning increasingly taking place outside the school timetable, at times of the learner’s own choosing, and in new locations. It is also clear that this is leading to increased inequality for some social groups who are not able to engage with mobile and broadband technologies productively. As Peter and Valkenburg (2006) make clear, the behaviour of young people in relation to technology is a key factor in how well it is used for the purposes of learning. However, it would be naïve to suggest that behaviour represents the whole story. In a paper relating to climate change policy, Shove (2010) challenges the assumptions made implicitly within current research on human behaviour. She outlines something called the ABC model (Attitudes/Behaviour/Choice). Shove argues that new research studies and social reports are commissioned all the time based on the assumption that personal agency lies at the core of social change. This is also evident in current education policy as it seeks to challenge disaffection, discrimination and gendered outcomes by examining the attitudes of pupils towards learning, for example, or the examination outcomes of different social groups. However, Shove argues that real change is impossible using such a framework, because it is too simplistic and does not take into account such issues as: transition arrangements for change; the impact current societal arrangements might have on change in the future; and the external provision of resources. In other words it fails to recognise larger scale societal problems and puts too much emphasis on individual agency. Such difficulties are not confined to climate change, but are also endemic in education reform.

One can argue in the case of educational technology in schools that we see certain culturally specific practices relating to time and technology access forming a paradox, which acts as a barrier to inclusion. This barrier is usually a function of geography and social class. It has two aspects, namely

the relationship of schooling to social time, and also the impact of technology on this relationship. It is in the case of the latter that social class differences are most prominent. Affluent areas have enhanced access to the infrastructure that facilitates good communication and individual educational improvement, such as cheap high-speed broadband, good quality 3G and 4G mobile phone signals and public transport that allows teachers and trainers to build effective personal networks within relatively dense populations and in a relatively time-efficient manner. Many deprived areas, on the other hand, suffer from patchy broadband provision, limited mobile phone signals based on technology that may be a decade or more out of date and little or no public transport despite the relatively wide geographical distribution of the population, placing limitations on the ability of teachers and trainers to engage with their fellow professionals and improve the lives of pupils.

Consequently there is arguably a notional time penalty or time premium for those in deprived areas, as they seek to engage with technology in a fruitful way. Even if routine and reliable access to high-level technology is technically possible, it may be that some groups of pupils are unable to afford it or do not wish to engage with it for their own reasons. Under such conditions it is not enough to see the role of educational technology relating exclusively to issues of individual agency. This represents a wider problem to do with the fair and effective distribution of resources across society, including within areas and amongst groups where it is not financially profitable for businesses to invest substantial resources, and it is here where Bernstein's 'conditions for democracy' and his idea of pedagogic rights seem to have the most resonance.

A final note: with apologies to Bernstein, to some extent this article engages in what he called time-warping (Bernstein [1996] 2000, 193) by placing his analytical categories on a time-plane in order to update and apply his theories to a new topic: the topic of time and technology in the twenty-first century. Bernstein would probably call this an example of elaborated technology amongst some groups in stark contrast to the restricted technology on offer to, and initiated by, others. Meanwhile our society blindly pursues educational technology policies that privilege what Bernstein might classify as the policy-friendly 'prospective' and forward-looking citizen with good access to technology, whilst leaving other pupils in the position of being 'retrospective' citizens, left behind in time. This may look like progress, but it does not represent social justice. The age of asynchronous learning is upon us, and with it the reinforcement of old inequalities as well as ample new ones.

Notes

1. An example would be the 'Mathletics' online software package, where children compete internationally with other school pupils around the globe for high scores when solving mental arithmetic puzzles. <http://uk.mathletics.com> (Accessed 23 September 2016).
2. An example might be the International Baccalaureate Diploma Programme curriculum, where teaching contact time is set depending on whether a pupil is studying for the standard level or higher level in a particular subject.

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