

Towards a cultural history of digital autodidacticism: changing cultural narratives of education

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Abstract

The essay argues that the various new imaginaries of the connected, creative, autonomous, coding, motivated and making digital learner have their roots in diverse and older visions of a different kind education system (especially the craft learner working in communities of practice) than that promulgated by the human-capital inspired neoliberal governmentalised States in the world today. Tracing the histories of the older imaginaries in a cultural history of autodidacticism I examine how they become incorporated by, and thus recalibrate competing visions of the “new learner of tomorrow”.

Key words: Auto-didacticism. Digital. Learning.

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Resumo**Por uma história cultural do autodidatismo digital: mudanças nas narrativas culturais da educação****Palavras-chave:**

Autodidatismo.
Digital.
Aprendizagem.

O ensaio argumenta que os vários novos imaginários do aluno conectado, criativo, autônomo, codificador, motivado e criador digital, que tem suas raízes em diversas e antigas visões dos diferentes sistemas educacionais (especialmente o trabalho em comunidades de práticas), mais que naqueles divulgados pelo capital humano dos governos de inspiração neoliberais no mundo de hoje. Rastreamos as histórias dos velhos imaginários na história cultural do autodidatismo, examinamos como eles se incorporam e assim recalibram as visões dos “novos alunos do amanhã”.

Resumen**Hacia una historia cultural del autodidactismo digital - cambiando las narrativas culturales de la educación****Palabras clave:**

Auto-didacticismo.
Digital. Aprendizaje.

El ensayo argumenta que los diversos nuevos imaginarios de los estudiantes conectados, creativos, autónomos, codificadores, motivados y haciendo el aprendizaje digital tienen sus raíces en visiones diversas y antiguas de un sistema educativo diferente (especialmente el trabajo en comunidades de práctica) más que a promulgada por el capital humano por los gobiernos neo-liberales en el mundo de hoy. Recorriendo las historias de los imaginarios más antiguos en una historia cultural de autodidactismo, examinamos cómo se incorporan y, por tanto, recalcan las visiones competitivas del "nuevos alumnos aprendices de mañana".

Introduction

In European culture at least, the figure of the autodidact is contradictory. Being self-taught has been regarded by the elite with a mixture of patronising indulgence, suspicion and admiration. The work of Bourdieu (BOURDIEU, 1984) segmented a hierarchy of taste-cultures where the positional value of being educated and fully conversant in a whole range of socio-cultural codes tended to position the autodidact as in some ways being deficient, where the value of his or her knowledge in formal technological terms was out of step with its cultural envelope. Although Bourdieu's critique came out of the radical rejection of post-war society even as it was being transformed into a whole new type of capitalism (HARVEY, 2007), in some ways it comes to stand for an older earlier tradition deriving from the enlightenment. That older period saw what it was to be educated in terms of learning to make a series of moral and cultural judgements rather than simply the acquisition of technocratic knowledge. This, as a whole series of 19th-century novels made clear, was associated with a form of "vulgarity" and intertwined with regressive attitudes towards social mobility and the maintenance of clear class-based boundaries.

On the other hand, however much this European elitist attitude towards self-learning dominated social mores and values, it is also true that the growth of a technocist middle-class particularly in the emerging industrial society of the US over the same period, valued a particular kind of enterprise, autodidacticism, and ultimately the ways that such qualities could lead to the celebration of the "self-made man". The figures of Benjamin Franklin or Thomas Edison are iconic in this second tradition, representing the triumph of ingenuity over vested interests and the success of technological/industrial forms of knowledge over the older humanities vision. In some ways, this cultural opposition is still being played out today in the debates between "experts" and the people and the ways in which right-wing populism legitimates itself through disavowing elitism.

Those debates are beyond the scope of this paper which examines the cultural imaginary behind current versions of digital autodidacticism. Self-teaching in the digital age has become a form of self-learning but I wanted to position my discussion within the broader historical context because some of the value debates attending on the older discussion permeate both our aspirations for, our anxieties about, and our interest in, the supposedly "new" modes of learning that are presumed to be intrinsic to the digital age. Considering the representation of autodidacticism in the digital age is a way into a discussion opened up by Dorothy Holland and her colleagues in their analysis of education as a "cultural narrative" (LEVINSON; FOLEY; HOLLAND, 1996). Rather than thinking of education in psychologistic or cognitive frames in terms of the acquisition and deployment of knowledge or in a Bourdieuan perspective, in terms of the socially valued membership or exclusion from taste cultures (ALBRIGHT; LUKE, 2008), examining how and why forms of education are valorised or rejected helps us examine

more objectively contemporary anxieties over the purposes of public schooling and the presumed role of the digital in such debates (BIESTA, 2011; SELWYN, 2010).

Understanding new and changing tropes of autodidacticism as part of the changing ecology of what it means to be educated in digital times, is an important contribution to the fierce debate now raging around the world about the role of public education systems – the institution of schooling we have inherited – in the context of changing learning practices at home, at school and in the community. Whilst traditional models of credentialism, the authority of received knowledge, the authority of the role of the teacher and the ingrained processes of intergenerational transmission seem close to breaking and expose themselves as being profoundly inadequate and inequitable in an era of globalisation, fast capitalism and digital neo-corporatism (GRAHAM, 2005), it may be that understanding the cultural history of particular modes of learning, such as the figure of the autodidact, will help us make sense of how we imagine the purposes and nature of education in the future.

The commercial and cultural organisation of digital nativism

A recent research project triggered this line of enquiry. A year-long ethnography of the lives of a London class of 13 – 14-year-olds, at school, at home, in their families and with their friends called "The Class" (LIVINGSTONE; SEFTON-GREEN, 2016) introduced us to Fesse, an engaging young man of East African descent who spent a lot of his time at home teaching himself to play guitar and to draw (SEFTON-GREEN, 2015). Fesse used YouTube to teach himself to play the guitar, watching videos of the *Red Hot Chili Peppers* and constructing a whole mode of domestic pedagogy involving playing along, filling out lead guitar parts, creating a notion of performance and audience, rehearsal and practice. His attitude towards the classical challenges of fingering, cord positions and so on were self-learnt and self-taught. Similarly, his artwork involved emulating his older brothers' interest in tattoo and graphic design and relied on pursuing his interests in cartoon and comic-book genres. The art teacher – and indeed Fesse himself - recognised both his talent and its limitations as measured by conventional academic discipline in his technique: his use of materials was from the teacher's point of view, limited and for all his focus, interest and motivation, his range of artwork was determined by his cultural interests rather than the teacher's perception of a more rounded curriculum.

Fesse's music education was totally bound up in YouTube - itself a sophisticated site for a huge raft of autodidactic opportunities. As a number of scholars have noted (Burgess, Green, Jenkins, & Hartley, 2009), it has grown into a significant platform structuring many kinds of educational experiences (e.g. HAUGSBAKKEN; LANGSETH, 2014). The platform, albeit highly commercially mediated and controlled, seems to enable different kinds of pedagogic relationships. As in the case of Fesse, it provided intimate, personalised, flexible, on-demand learning opportunities with the huge range of resources. It is

of course free and although basically video-based, draws on a whole range of instructional multimodal methods and techniques.

Whilst Fesse, might seem to exemplify a typical digital native (for critical discussion see Selwyn, 2009), demonstrating agency and purpose in his construction of a kind of educational "choice biography" (GIDDENS, 1991). I would argue that his self-teaching with YouTube and self-learning in graphic arts, actually demonstrate older kinds of autodidactic practices that predate digitalisation. On the one hand, his behaviour exemplifies a normative individualised language of agency: parents and peers and indeed readers of our book, focused on his engagement, motivation and interest. However, such a psychological lens may misread the embedded traditions of these learning practices as, on the other hand both art and music have their roots in older forms of participation, apprenticeship and the philosophical tradition of practice (SLOTERDIJK, 2014).

Making and Tinkering

Fesse is of course only one case even if he exemplifies stereotypical features of digital autodidacticism. One whole field that fetishizes the self-teaching and self-learning community is that of "making and tinkering". Here the values of the domestic garage or garden shed (despite their curious socio-geographical specificity in the myth of Apple or the homebrew computer clubs of the 1970s (TURNER, 2008)) are elevated into fully fledged educational practices and domains. The last 20 years have seen an alliance of economic ambition, a nostalgia for a certain vision of childhood and a profoundly technocratic version of human capital coming together around the elevation of making and tinkering. Partly inspired by a theoretical analysis of the digital economy (ANDERSON, 2007) and partly inspired by broader ambitions for the creative economy (HOWKINS, 2002), making has taken off as a new domain, half outside the formal education system and half allied to design and technology courses, but focusing around a peer-led community of practice: see for example, <http://makezine.com>, makerlab, makerfaire or tinkering school.

The maker movement is tightly bound up with notions of hacking and tinkering. Both of these practices are exclusively digital and whether they have their roots in the more pro-social games "modding" practices as part of remix culture (LESSIG, 2009), or the far more socially problematic hacking culture (HIMANEN, 2010, MASON, 2008), or even derive from sampling in music or other art forms (MILLER, 2004), they are all based in a distinct mode of educational transactions. Significantly, learning takes place through online interactions in communities of knowledgeable peers. There are rarely credentialed authorities, although individuals often hold great influence through expertise, (O'HEAR; SEFTON-GREN, 2004). There are of course, no syllabi or conventional forms of assessment and

participation in these kinds of community is, like Fesse's, motivated by interest and frequently a desire to belong (ITO et al., 2010). The strong sense of being outside formal educational structures and systems reinforces the participants' sense of authenticity, integrity and the power of these kinds of self-learning experiences.

As suggested by some of the language, like the spelling of "faire" in maker faire, there is something both new and old in these movements. It is new inasmuch as its content relates to digital technology with a strong emphasis on forms of coding or indeed preparation for 3D- printing. This suggests a current economic relevance and purpose. On the other hand, there is something explicitly traditional in its cultural signals. It harkens back to a notion of plastic skills, craft and artisanal production. This is partly economic ideology but partly also a way of connecting contemporary childhood with an older tradition going back as far as the Froebel gifts where an intrinsic relationship between certain kinds of play and normative development has been inscribed into 20th-century educational philosophy. In terms of our focus, I want to suggest that there is much in the maker and hacker movements that bestows on the self-taught technological outsider a new kind of autodidacticism – where being an outsider is now valued rather than looked down upon and where forms of self-learning are now the best and only ways to enter into what constitutes an educated community.

New education philosophies

Whilst making and tinkering movements have experienced a renaissance in the digital era, in some ways as we will see below, they derive from other kinds of educational practices – especially relating to craft expertise. This current era has spawned a number of theories of learning to try to account for this reconfiguration of novice learner, distributed expert knowledge, and open access knowledge brokers and transmission channels. These current theories take a very different attitude towards self-teaching than found in the conventional education system. Indeed, for our purposes what is interesting is how they valorise forms of autodidacticism in contrast to the earlier traditions outlined at the beginning of this paper.

Connectivism, most fully developed by George Siemens (SIEMENS, 2005), builds on constructivism as most fully expanded by post-Piagetian scholars (PAPERT, 1993) by taking socio-cultural understandings of the relationship between the individual, the society and the learning context into a more fully developed theory of learning for the network society. Connectivism suggests that learning occurs as a consequence of participation in frequently chaotic and complex networks where knowledge is proposed, tested and validated even as it is distributed across a host of real-world complex situations. In this theory, learners are characterised in terms of their adaptability and their openness and responsiveness to finding new ways of behaving and understanding through the myriad of connections

that are made in a digitally interconnected world. Typically, this kind of theory seeks to explain how the change from credentialed authority in technical and practical knowledge to more accessible, shared and open forms of knowledge-transfer is both constituted by, and an effect of, the network society (CASTELLS, 2000). While this kind of theory might be helpful in explaining economic growth in terms of the changing role of knowledge-transfer in relationship to productivity (BALDWIN, 2016), it is not always explicitly directed at ways in which we customarily understand what it is to learn - and the progressions in any learning process. Connectivism hypothesises a kind of learner who is flexible, open and connected and who knows how to assess, find, interpret and utilise knowledge as and when it can be found. This kind of learner possesses all the drive we might associate with traditional autodidacticism but it does suggest kind of individualised self-sufficiency – again a theory of mind inherited from the older traditions – the fully developed inquisitive mind held back by lack of access or inappropriate credentials. And, of course it is only through empirical investigation that we can assess how widespread this experience is, for many people around the world.

The “synthetic” (PENUEL;VAN HORNE; DIGIACOMO & KIRSHNER, 2016) theory of Connected Learning (ITO et al., 2013) (to which I acknowledge an affiliation), attempts to redress the connectivist theory by proposing a model of interest-driven learning. In this model, the learner is assumed to be in some ways motivated but it is through participation in frequently peer-led, affinity groupings (GEE, 2004) significantly online ones, and through a recursive and structured progression that blends formal academic knowledge with these new opportunities for participatory culture, that learning progression occurs. Connected learning, starts from the notion of an interest, or a spark, or a motivation but builds understanding of structure, progression and even in its design elements, ways of organising projects and interventions, into a theory of engaged learning taking place primarily outside of formal educational institutions but with connections to knowledge domains that allow a transfer back into or ways of criss-crossing between, the formal and informal knowledge domains.

Examples of connected learning in action might be the studies of meta-game in the StarCraft community¹ or the creative mods amongst "Little Big Planet" players². These studies build on the work of fans and fan communities (JENKINS, 1992) and particularly explore participation in online worlds – especially through gaming – to examine what has been called "participatory culture" (JENKINS, CLINTON, PURUSHOTMA, ROBINSON, & WEIGEL, 2007) as an ecosystem for the development of learning and even other kinds of civic participation. Connected learning stands as an example of a disruptive theory produced to explain how forms of learning taking place in a highly digitalised and

¹ <https://dmlhub.net/publications/crafting-metagame-connected-learning-starcraft-ii-community/>

² <https://dmlhub.net/publications/welcome-sackboy-planet-connected-learning-among-littlebigplanet-2-players/>

computerised network society might work in practice. It is also a theory calculated to address weaknesses in conventional educational philosophy where traditional theories of learning and common-sense assumptions of how schooling works in society do not seem adequate to address the creative, productive (and at times destructive and antisocial) experiences of learning now taking place in a whole host of new kinds of educational environments around the world.

Both Connectivism and Connected Learning owe much to the work done by sociocultural theory (SCRIBNER; COLE, 1973) in critiquing a purely psychological theory of mind.

Sociocultural theories of learning pay great attention to contexts, social interactions, practices, discourses, activities and self-understanding of traditions as a way to explain how participation in complex social practices is both in and of itself a kind of learning and the end result of learning. Perhaps one of the best-known expositions of this approach to education is known as "communities of practice" (LAVE;WENGER, 1991) – a theory developed from observation of a whole host of different kinds of learning experiences that predated the digital – but which set the scene to understand member-led, peer learning and other forms of apprenticeship; all of which placed great emphasis on a progression from novice to expert in highly structured, often highly transmissive educational practices albeit those found in real world learning situations rather than schools.

In some ways, the communities of practice approach describes practices that are quite the opposite of the self-learning, self-teaching autodidacticism that we have observed so far. Whereas the autodidact can learn outside the community of practice and can access knowledge and skills without serving traditional forms of apprenticeship, the community of practice accounts often describe long periods of learning through apprenticeship.

I would suggest however, that observation of participation in digital cultures, although deriving from the "communities of practice" tradition actually parts ways in suggesting forms of community without the regulatory authority found in the kinds of traditions described in the paragraph above. Here, theories of learning in digital culture perhaps acknowledge a line of thought back to the work of Malcolm Knowles (KNOWLES, 2015) and the concept of Andragogy. Working in the field of adult learners, Knowles's theory of learning for adults (the Andros (men) replacing the Paedos (child) in his neologism), can now be read as a celebration of the independent autodidactic learner that we have observed already taking centre stage in accounts of the use of Youtube, making, tinkering and hacking. The adult learner is self-motivated, and has a different disposition toward, and need for, knowledge; much as the self-reliant entrepreneurial technologist learnt and taught themselves the kinds of practices needed for the industrial age.

The popularity of andragogy and its role in a whole variety of adult education movements with its direct assault on the primacy of schooling as the single site for education in contemporary society clearly

fed into some of the ambitions for open learning where a form of self-teaching and self-reliant independence can be taken as a way of, if not replacing, then circumventing traditional forms of education (BROEKMAN, 2014). The open education movement thus joins the dots between the autodidacticism of the pre-digital and the motivated learner posited by these new theories of education, via the work of Knowles's andragogy. Key here, is an attention to the individualised agency in the person of the learner him or herself which is a very different way of formulating what it is to be a learner from both the rationalist or romantic in the history of education.

Craft, code and expertise

The final thread in our discussion derives from recent attention to the tradition of craft expertise. This is apparent in discussion around the artisanal qualities present in the making and tinkering culture where much of the self-learning involved in modes of apprenticeship is often based on a pedagogy of trial and error, the notion of commitment and recursion and where the practices of coding itself are understood as an aesthetic practice where qualities of elegance and parsimony are prized (COX; MACLEAN, 2012). Coding – the practice at the heart of much making and tinkering – it is frequently characterised as a form of craft discipline. This entails very specific kinds of pedagogic practices most beautifully described by the author Vikram Chandra, (CHANDRA, 2014). In his book " Geek Sublime" he likens the writing of code to the practice of artistic writing and thus draws a connection between the notion of apprenticeship, discipline, a reliance on tradition – often involving rote learning, copying and repetition – all of which place this mode of digital creativity firmly in older traditions where skill, care, persistence, attention to detail and a whole host of craft values are valorised.

As noted above, there is an emotional disjuncture between the valuing of these human "slow" skills – now rather pejoratively associated with the contemporary hipster – and the fast, automated, impersonal aesthetic frequently associated with the anonymous, control of the digital. Making, and tinkering cultures have gone a long way to connect older craft practices with these new ones. A good example of this would be the work around e-textiles (BUECHLEY, PEPPLER, EISENBERG, & KAFAL, 2013) which explicitly weaves together a feminist digital culture stressing continuities between older fabric arts and the new wearable digital technologies.

The learner in these craft cultures is again a very different kind of person from the subject produced by modern schooling. Craft-learning draws on tradition and apprenticeship but in contradistinction to some of the social conservatism implied in the communities of practice approach, and in common with the active, interest-driven, motivated learner found in the connected learning tradition, values of practice, participation and self-teaching predominate. This has been argued most fluently by the

sociologist Richard Sennett, e.g. (SENNETT, 2008). In seeking to recover the traditional, the plastic and the manual, Sennett also draws the contrast between forms of dignity and respect found in older forms of labour – and he is interested in the wider implications of subjectivity and class consciousness rather than simply individualised self-actualisation - to the anonymized, impersonal, corporatized world of work that characterises the culture of new capitalism (SENNETT, 2007). This larger political canvas is slightly outside the remit of this article, but it shows how wider interests in forms of craft learning and its affiliations and disconnections with the digital act as a touchstone for re-conceptualising the nature of learning in the digital age.

Whilst there may be an element of nostalgia³ in this recovery of artisanal craft especially in the context of such dramatic threats posed by the digitalisation of everything, it is interesting from our point of view unpick the role of self-learning in this construct. As popularised by Malcolm Gladwell (GLADWELL, 2008), forms of craft learning are rooted in the notion of practice, perfection, repetition and improvement. Fesse's music learning, as described above, could just as well have been an example of this form of education as anything else. But in what ways might the figure of the autodidact and the craft learner have points in common or points of difference in the digital age?

The craft learner is to a great extent involved in a process of self-teaching through practice. The craft learner is assumed to be interest-driven, self-motivated and engaged through forms of participation in the challenge for mastery and accomplishment. These qualities match the aspirations of the 19th-century autodidact and they draw on similar qualities of resilience and above all, technological, practical knowledge that distinguishes the industrial from the cultural traditions in education. There clearly are differences here as much as there is overlap. The true autodidact is less interested in authority and tradition and more in mastery and performance. On the other hand, the craft-learner is as likely to pay attention to imitation and copying in order to achieve entry into whatever sphere they are working in. Yet in some ways, this approach to performativity is also a point in common. In many crafts, entry into employment has been traditionally regulated by Guild structures and this is not true of the hacker, the maker or the tinkerer – even though, it should be said that studies of hacking culture do show the growth of these traditional means of control and regulation (HIMANEN, 2010).

Perhaps the most significant contribution from this craft tradition into the modes of learning practices now more common through forms of participation in digital culture, is the emphasis on individualised, self-motivated practice. The craft-learner is an active agent in the learning process through repetition, copying or whatever. This is as true for autodidacticism in its many incarnations. It is also a feature of Connectivism and Connected Learning. The digital learner thus derives from a different paradigm of the learner constructed in traditional education – namely the passive object of transmissive

³ see Williams, R. (2016). *The Country and The City London*. Vintage Classics.

didactics. She or he does have something in common with the constructivist child who learns through reflection on experience but differs significantly in its control and independence from that tradition. Understanding how autodidacticism has influenced the construction of "digital learning" in this way thus helps us understand the particular cultural narrative of education (LEVINSON; FOLEY; HOLLAND, 1996) dominating our times.

Cultural histories of education

A history of autodidacticism, especially one that pays attention to how the figure of the autodidact has been constructed in opposition or as complement to the normative subjects of schooled education over the past couple of hundred years, is instructive for a variety of reasons. It helps us contextualise the furnace of debate around the "new" practices of digital learning and to disentangle the relationship between the authority of academic knowledge with its credentialing function, and the challenge to democratise access and acquisition of forms of knowing beyond the elite.

A cultural history also helps us to pay attention to aspects of the contemporary language we use to describe seemingly innovative practices showing how they have been imagined and, in some cases, re-contextualised from the past. Seeing current practices, like making or tinkering, and contemporary philosophers of education like Connected Learning through the lens of a cultural history can show how, in this case, the figure of the autodidact has been incorporated and modified into the supposedly digitally native learner. In this process, some of the anti-establishment impulses behind autodidacticism have now become mainstream just as, at the same time we can see moves to re-contextualise their potentially unsettling effect. This rhetorical move manifests itself in ways that the newness of the digital learner both reasserts agency at the same time as maintaining boundaries.

Part of the anti-elitist thrust of the autodidactic tradition came from its roots in an interest in new technologies – in the 19th century this meant of course the science and engineering of industrialisation. We can see how this approach has now resulted in an extreme “informaticization” of teaching. By this, I mean the renewed attention in many education systems around the world to understanding teaching and learning as the most efficient transmission of information without the troubling epistemological anxieties about who defines what is forms of knowledge and without a critical interest in developing ways of thinking, ways of making judgements and ways of evaluating. The increasingly computerised relationship between curriculum, teaching and assessment in many global school systems reinforces this tendency towards education is simply the access and retrieval of information.

On the other hand, the attention in the autodidactic tradition to qualities of interest, motivation and practice are breaking down some of the pastoral control mechanisms (HUNTER, 1994) that have

structured industrial schooling. Learning in the digital age is more sensitive to competence than to age or ability stratification. Although schools are conservatively organised in this way, the highly individualised competency-based accomplished of more independent and project-based learning are beginning to chip away at this form of social organisation.

In the 19th century, as outlined at the beginning of this essay, one of the key challenges posed by forms of autodidacticism was to the class-based control of formal academic knowledge. The digital learner poses a similar threat to these traditional modes of social control especially by opening up forms of access to the many rather than the few. Yet, as in times past we need to be cautious, about claims made for the ways in which access to knowledge and indeed communities of learners, can now mean that the authority of the school and the Academy is open to question. Such studies as there are about the class composition of new digital learners do suggest that it is forms of cultural capital which continue to provide routes to both economic and social success rather than any structural reconfiguration around access and equality (WATKINS et al., 2018, LIVINGSTONE; SEFTON-GREEN, 2016).

Nevertheless, the popularity and success of the making, tinkering and hacking culture has led to an interest in coding and indeed the wider question of what might be at stake in who learns to code and what knowing about code might mean for the limits for full civic participation (LUPTON; WILLIAMSON, 2017, ISIN; RUPPERT, 2015, RUPPERT, ISIN, & BIGO, 2017). Here we can see how forms of expertise framed in maker culture, now flying under the banner of DIY, are beginning to loosen some of the regulatory powers of conventional schooling and challenge the authority of certification. The exact nature of this “loosening” is of course open to debate as we can also see how the entry of these out-of-school digital practices into the Academy take different forms and are often re-contextualised at the expense of their original more “open” inspiration.

The struggles and tensions identified in this essay between forms of educational practices developed in out-of-school contexts and the ways that they are incorporated and then re-contextualised – and I use this word in the ways that it was theorised by Basil Bernstein, (BERNSTEIN, 1973), suggesting forms of institutional incorporation and control – will continue. The agency and challenge demonstrated by people who find meaning in learning and purposes in studying outside of formal education will continue to pose searching questions about the ways in which our school system continues to exert the power that it does. Whilst learning in the digital age may not yet provide the kinds of structural leverage to produce the kind of change that many of its advocates say it promises, through its allegiance to these older forms of making meaning and learning in communities of practice in the craft tradition, we can at least see germs of an instability yet to come.

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