Privatising educational leadership through technology in the Trumpian era

DOI:

[10.1080/00220620.2017.1395826](https://doi.org/10.1080/00220620.2017.1395826)

Document Version

Accepted author manuscript

[Link to publication record in Manchester Research Explorer](#)

Citation for published version (APA):

Courtney, S. (2018). Privatising educational leadership through technology in the Trumpian era. *Journal of Educational Administration and History*, 50. <https://doi.org/10.1080/00220620.2017.1395826>

Published in:

Journal of Educational Administration and History

Citing this paper

Please note that where the full-text provided on Manchester Research Explorer is the Author Accepted Manuscript or Proof version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version.

General rights

Copyright and moral rights for the publications made accessible in the Research Explorer are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Takedown policy

If you believe that this document breaches copyright please refer to the University of Manchester's Takedown Procedures [<http://man.ac.uk/04Y6Bo>] or contact uml.scholarlycommunications@manchester.ac.uk providing relevant details, so we can investigate your claim.

Privatising educational leadership through technology in the Trumpian era

Steven J. Courtney

Manchester Institute of Education, University of Manchester, UK

Abstract: This article focuses on the changes that the election of Donald Trump enables in education policy domestically and in education discourse internationally. I argue that Trump's own charismatic leadership style is a distraction from the privatisation that it is facilitating through Betsy DeVos, Trump's appointment as US Education Secretary. I draw on two contemporary examples of technology-enabled privatisation in education — cyber charters and predictive analytics using big data — to argue that in the Trumpian era, educational leadership may be shifting from corporatised forms, where professionals understood as “school leaders” fulfil corporate objectives through corporatised means. Instead, Trumpian-era privatised educational leadership retreats fully behind the technology boardroom door, where it renders superfluous lead professionals in education institutions, and where its objectives are to generate profit through re-conceptualising learners as data providers. This analysis highlights the need for new tools and methods to describe and explain what is happening, and to help develop understandings of what educational leadership in this new landscape might be, do or achieve.

Keywords: corporatised educational leadership; privatisation; Donald Trump; cyber-charters; big data; predictive analytics; technology

Introduction

In considering educational leadership in the era of President Trump, this article looks beyond Donald Trump's own leadership style, which commentators have associated with populism (Gusterson, 2017), demagoguery (Allin, 2016) or even with elements of fascism (Giroux, 2016; McGaughey, 2016). Instead, I aim to reflect on his potential legacy to the field through the policies he endorses and the discursive conditions he is reproducing or creating. I argue that his election, along with advances in technology and his appointment of the pro-school-choice billionaire Betsy DeVos, has further enabled and legitimated a suite of education policies that has implications for how education and its leadership are conceptualised and enacted that extend beyond the U.S domestic agenda. I intend drawing on two examples of contemporary practice — cyber charter schools and predictive analytics using big data — to elucidate technology-enabled privatisation. I interplay these phenomena with conceptualisations of educational leadership to argue that the conceptual opacity underpinning educational leadership now renders that very leadership obsolete by enabling a corporate agenda where the locus, goals and mechanisms of decision-making are globalised, privatised and consequently, are moving out of schools completely. Previous conceptualisations of corporatised leadership highlight (but do not solely focus on) what might be understood as the endogenous privatisation of those professionals constructed as school leaders themselves, locating leaders and leadership at least partly within physical spaces recognisable as schools and within biographical accounts featuring pedagogy and professionalism. Explicit relations with and interventions from the private sector may arise, for example, through governance arrangements and industry-informed teaching and learning — or content creation and delivery (Courtney, 2015a, 2016; Courtney & Gunter, 2015), but the key actor remains the person heading up the school. However, these new forms of privatisation are exogenous: they are enacted in boardrooms far from the school. Indeed, such

schools may not even exist as physical entities. This raises profound questions for how the leadership of such “educational” activities may be understood and practised. Contemporary conceptualisations of educational leadership are gravely lacking in their capacity to describe, much less to explain the current landscape. Consequently, new methods and tools are required to do this work, and further, to imagine what leadership in this context might be, do or achieve in order to respond to the challenges identified to education as a public good and to its leadership as public service.

A historical perspective on corporatisation and privatisation

The two examples I am drawing on here are not creations of the Trumpian era: cyber charters were signed into law in 2003, but most of the legislation pertaining to them was passed during the Obama administration (Education Commission of the States (ECS) State Policy Database, 2017). Similarly, Trump’s election coincides with only the latest stage in the continuing evolution through the Obama years of data into *big* data and from there, to new ways of interrogating and exploiting these data using predictive analytics (Thompson, 2017; Williamson, 2016a). Historical parallels may be drawn here with the New Labour administrations in the UK (1997–2010), whose adoption and intensification of a neoliberal, corporatising agenda in education was justified through claiming social-justice objectives (Gunter & Chapman, 2009). When the Conservative/Liberal-Democrat Coalition government succeeded New Labour’s final administration in 2010, the policy infrastructure and discursive groundwork achieved by this latter enabled the rapid dismantling of most of what remained of a welfarist, public education system (Courtney, 2015a). Ravitch (2017), blaming the Democrats for Betsy DeVos, describes a similar phenomenon in the US:

The Obama years saw an epidemic of new charters, testing, school closings, and teacher firings. In Chicago, Mayor Rahm Emanuel closed 50 public schools in one day. Democratic charter advocates...have increasingly imported “school choice” into the party’s rhetoric...even though the entire idea of “choice” was created by white Southerners who were scrambling to defend segregated schools after *Brown v. Board of Education*. (Ravitch, 2017, unpaged website)

Betsy DeVos’ appointment builds on this legacy and heralds a new intensification in the privatisation of education and its leadership. DeVos is a long-standing supporter and funder of school-choice policies, and leads the not-for-profit American Foundation for Children, which campaigns and lobbies for school-voucher policies as well as charter-school policies (Deruy, 2016b). DeVos’ proposal for her first full education budget consisted in cuts of \$10.6 billion from federal education programmes, but in increases of around \$400 –500 million to expand charter schools (Brown, Strauss, & Douglas-Gabriel, 2017). In summary, DeVos, endorsed and supported by Trump, is a major actor in facilitating and enabling corporate interests to flourish at the expense of the public good.

Advances in technological capability are interplaying with this intensifying privatisation of education to provide new, troubling answers to the question now determining educational provision: that is, what forms, activities and conceptualisations will most effectively and efficiently increase economic capital invested by private providers in the education sector? In responding to this question, I intend adumbrating two contemporary technology-enabled “educational” phenomena that arguably best suit the needs of capital and which indeed are being privileged under a Trump/DeVos regime: cyber charter schools and predictive analytics using big data, before exploring what these mean for educational leadership.

Cyber charter schools

Cyber charter schools ‘are a cross between home schooling and charter schooling, in which technology plays a central role in the delivery and management of teaching and learning’ (Hasler, Barbour, & Menchaca, 2014, p. 379). Cyber charter schools ‘typically provide students with computers, software, and network-based resources, while also providing access to teachers via email, telephone, web, and/or teleconference’ (Gill et al., 2015, p. xi). In their study focusing on Pennsylvania, an important and early site of cyber-charter activity and development, Mann and Barkauskas (2014) show how claims may be made for the potential of cyber charter schools to improve social justice for students on the grounds of *equity* — through, for example, increasing access to the curriculum, providing resources and eliminating major costs for students, and *rights* — through enhancing parental choice, student safety and learning pace. Nonetheless, they point out that such claims are set against strong counter-arguments concerning a lack of daily interaction, largely poor school quality and accountability, and misleading marketing. These issues are compounded by other findings (again, from Pennsylvania) that indicate that cyber charter schools are disproportionately attended by rural students, and/or those with special educational needs and/or disadvantaged backgrounds (Mann et al., 2016).

Importantly, the great reductions in overhead costs relative to bricks-and-mortar schools, and the fact that they may receive an equal amount of funding per pupil as those schools, mean that it is possible to generate considerable profits (DeJarnatt, 2013). This has attracted a disproportionately high number of for-profit providers to run them (Christie et al., 2014) and a structural lack of oversight and accountability is leading to claims of susceptibility to fraud and corruption (DeJarnatt, 2013; Hasler et al., 2014) over and above the poor educational outcomes typically achieved there (Morgan, 2016).

Drawing on the critical framing of the global field of schooling provision deployed by, *inter alia*, Lubienski (2006) and Hatcher (2015), I suggest that cyber charter schools constitute a growing issue of international significance for the following reasons. First, the model of the “autonomous”, state-funded school, which is less regulated and more engaged with the corporate field, is well established internationally (Brown and Vollman Makris, 2017; Court and O'Neill, 2011; Courtney, 2015b). Indeed, the fundamental legal framework has been susceptible to explicit processes of global policy borrowing (Whitty, 2016). Second, both the underpinning technology and the private providers are global: the largest, K¹² Incorporated, has an international branch (K¹² International Academy — see www.icademy.com) and a vision ‘to create a *global* community of students, teachers, parents, and mentors that is connected by technology...’ (K¹² Incorporated, 2017, unpaginated website, emphasis added). DeVos has previously invested in this company.

Cyber charter schools start to provide some answers concerning the ‘what’ (i.e. a commodified curriculum), the ‘who’ (i.e. disproportionately socio-economically disadvantaged students) and the ‘how’ (i.e. accessible, inexpensive internet technology). The second area that I am exploring here — predictive analytics using big data — adds to these more details concerning the ‘why’: that is, the potential for massive return on capital investment in education and for the opportunity to shape its governance, leadership, forms and objectives in a way that permanently disrupts public education.

Big data and predictive analytics

In this section, I draw research into the datafication of education whose implications for educational leadership I then tease out. Williamson (2016a, 2016b, 2017) is one of a number of scholars (e.g. Selwyn, 2011, 2015; Thompson, 2017) to identify a huge growth in the

amount and type of data used in education, as well as corporatised reconfigurations in how, why and where such big data is used. The effect is the creation of new forms of what Williamson (2016a) calls ‘digital education governance, whereby digital technologies, software packages and their underlying standards, code and algorithmic procedures are increasingly being inserted in to the administrative infrastructure of education systems (p. 123). He shows how the social relations and practices producing and produced by consumers’ interactions with big data-enabled predictive analytic services such as Amazon are being purposively extended into the field of education by powerful corporate actors, where they ‘are positioned to short-circuit existing educational data practices, enabling data and feedback to flow synchronously and recursively within the pedagogic apparatus of the classroom itself’ (p. 125). The software adapts in response to the continual feedback elicited from learners through, for instance, ‘webcams, facial vision technologies, speech analysis, and even wearable biometric devices’ (Williamson, 2017, unpagged). Thompson (2017), describing Computerized Adaptive Testing (CAT) in Australia, identifies a similar adaptive use of technology to test students. This adaptation is *productive* in that it aims to manipulate, for instance, learners’ emotions towards a preferred state (Williamson, 2017): for Thompson (2017), this state is ‘docile, cooperative, responsive and committed to manifesting more and better data (p. 835). This enterprise is currently endorsed by the World Economic Forum, which has identified a MIT-Media Lab-derived company called Affectiva as a prime example of pioneering practice (Williamson, 2017). There are cognate strands addressing cognition, and so IBM is presently building a partnership with Pearson to ‘embed “cognitive tutoring capabilities” into Pearson’s digital courseware’ (Williamson, 2017, unpagged). It is not difficult to see how such technologies might fit into an educational landscape where, for instance, cyber-charter schools are privileged, conceptually available for international policy

borrowing and materially scalable by existing global companies. Moreover, Silicon Valley is investing heavily in its own startup schools that Williamson (2016b, p. 2) describes as:

... scalable technical platforms ... they are funded by commercial and venture capital and philanthropic sources; staffed and managed by entrepreneurs, executives and engineers from some of Silicon Valley's most successful startups and web companies; and proposed to reinvent, reimagine and rebuild education in the mould of Silicon Valley itself.

Notwithstanding the devastating implications for theories of and practices in pedagogy and learning, which are beyond the remit of this paper, there are equally concerning implications for the conceptualisation and practice of educational leadership. Williamson starts to note these, pointing out that the 'data infrastructures' constituting these processes 'are peopled by new kinds of experts in digital data analysis, knowledge production, presentation and communication, and are located in particular institutions, organizations and communities with their own ways of doing things, knowledge practices, expert methodologies, styles of thinking, professional subjectivities, and objectives and aspirations' (Williamson, 2016a, p. 126). It is to this that I now turn.

It's educational leadership, Jim, but not as we know it

When schools move online, educational leadership as it has been previously conceptualised and enacted ceases to exist. Educational leadership has always been conceptually problematic (Eacott, 2015b), but might usefully be adumbrated as the purposeful influencing and/or management of teachers; of learning processes; and of institutions. Concerning teachers, pedagogy and learning, knowledge moves in both the models described above to technical

experts in technology companies, and away from teaching professionals located in shared spaces with learners engaging in human interactions. These new experts are instead *line-managed* by similar, more senior technical experts against techno-corporate rather than educational criteria. Improvements in attainment will require changes to the software rather than more inspiring learning encounters and relations, and so the tools of leadership are algorithmic rather than psycho- or sociological. The ‘leadership’ of the third — the institution of the school — is rendered unnecessary through cyberfication, where buildings and the professional communities that inhabit and constitute them are reduced to superfluous overheads.

Learning becomes neoliberalised in its transformation from an orientation and motivation based on the *community* (Wenger, 1998) to the *self*, through recursive predictive-technology-enabled feedback loops. This signals the privatisation of learning in the sense that it is private and depoliticised (Courtney and Gunter, 2017), rendered apparently objective through datafied solipsistic subjectivism: only the learner matters, or is even present. Such learning does not require leading in any meaningful sense, which is relational if it is anything. In claiming this, I am drawing on a growing body of literature (e.g. Crevani, 2015; Cunliffe & Eriksen, 2011; Eacott, 2015a,b) that takes seriously the long-standing notion that leadership is constructed between actors, and so may be enacted when any of those actors purposefully alters the reality of the other(s), through e.g. framing a situation or positioning oneself or others. In the new learning environments I am describing, the space between actors is susceptible to conceptual occlusion through the sensory impression of isolation. This isolation is only from other humans: the desire to have one’s reality altered (or *followership*) can very well be fulfilled by the substituted technology. There is neither space nor requirement for leadership.

These developments are not hypothetical, but are taking place now, and so I turn now to how the field might respond to the challenges I have set out. Educational leadership as a field of intellectual study and as a constructed suite of professional practices is presently dominated by thinking and praxis which have been described as *functionalist* (Courtney, McGinity, & Gunter, 2018). Functionalism is a product and producer of the hegemonic neoliberal project in evidence in politics globally since the 1970s (Harvey, 2005). Functionalism focuses on:

... the presentation of solutions to identified problems, and this can be descriptive through empirical work that leads to understanding ... and/or normative through the promotion of a particular idea about how a problem should be solved. (Gunter, 2012, pp. 338–339)

Functionalist research draws attention to deficits constructed as individualised within a given system and seeks to address them, with less or no consideration given to wider structural issues. Given this, functionalist research has had neither the methodological tools nor, importantly, the axiologically inspired inclination to problematise the recent turn to an increasingly valorised model of corporatised educational-leadership-from-afar which is the practical outcome of the contemporarily dominant model of *system leadership*. Here, the CEO of an overarching academy or charter trust is probably not in the building, or even in any educational institution at all. Indeed, much functionalist research colludes with this regime, inadvertently or otherwise (see, e.g. Hill & Matthews, 2008), by asking primarily how such practice might be made more effective, rather than in whose interests such arrangements work and do not work, and what this reveals of the underlying power relations. Such questions, and the theories that illuminate them and enable sociologically informed responses, underpin *critical* scholarship, which is where I locate my work.

My claim here is that the purposive adoption of an approach which is misleadingly a-theoretical at best, and at worst *anti*-theoretical (Courtney et al., 2018) has left functionalist research and researchers unable to address meaningfully the challenges described above for education, much less for educational leadership. This is because by continually asking only the question, “*What works?*” and not engaging with underlying theories of power, the range of possible answers does not preclude the hyper-privatised landscape that I have described above, where educational leadership turns out not to be as fundamental after all to effective and, particularly, efficient learning as has been claimed (Leithwood, Harris, & Hopkins, 2008). Whilst it may be going too far to claim that Trump’s election signifies the death of educational leadership as we have known it, nonetheless new formations and technologies (in all senses) of learning are evident which render it superfluous: these are being privileged in policy owing to the Secretary of State’s ideological and material support (Turner, 2017). This will have international implications, since the technology companies fulfilling these new roles presently operate across borders.

Just as New Labour in the UK realised that it needed Headteachers on board with their “modernisation” agenda if the field of education was to be transformed, then so it may turn out that these same professionals are vital to act as the last bastions of public-ness in what is becoming a global market of edu-businesses, with what we have quaintly understood as “provision” newly conceptualised as the primarily learner-data-generating element of total(ising) private enterprises. If so, then the signs are not promising, particularly in England (Courtney, 2015a, 2016), and those constructed as school leaders may well come to regret the eagerness with which many of them have embraced the corporatism that may render them obsolete.

Acknowledgements

I would like to thank Bryan Mann, Rob Higham, Helen Gunter and Ruth McGinity, conversing and/or corresponding with whom has greatly clarified my thinking on some of the aspects of this paper.

References

- Allin, D. H. (2016). Donald Trump's America. *Survival*, 58(2), 221–228.
- Brown, E., and Vollman Makris, M. (2017). A different type of charter school: in prestige charters, a rise in chachet equals a decline in access. *Journal of Education Policy*, [advance online publication], DOI: 10.1080/02680939.2017.1341552
- Brown, E., Strauss, V., & Douglas-Gabriel, D. (2017, May 17). Trump's first full education budget: Deep cuts to public school programs in pursuit of school choice. *The Washington Post*. Washington D.C. Retrieved from https://www.washingtonpost.com/local/education/trumps-first-full-education-budget-deep-cuts-to-public-school-programs-in-pursuit-of-school-choice/2017/05/17/2a25a2cc-3a41-11e7-8854-21f359183e8c_story.html?tid=sm_tw&utm_term=.1d813e5e32ed
- Christie, K., Millard, M., Thomsen, J., & Wixom, M. (2014). *Charter Schools: Choice of Schools*. Denver.
- Court, M., and O'Neill, J. (2011). 'Tomorrow's Schools' in New Zealand: from social democracy to market managerialism. *Journal of Educational Administration and History*, 43(2), 119–140.
- Courtney, S. J. (2015a). Corporatised leadership in English schools. *Journal of Educational Administration and History*, 47(3), 214–231.
- Courtney, S. J. (2015b). Mapping school types in England. *Oxford Review of Education*,

41(6), 799–818.

Courtney, S. J. (2016). Corporatising school leadership through hysteresis [advance online publication]. *British Journal of Sociology of Education*.

<http://doi.org/10.1080/01425692.2016.1245131>

Courtney, S. J., & Gunter, H. M. (2015). Get off my bus! School leaders, vision work and the elimination of teachers. *International Journal of Leadership in Education: Theory and Practice*, 18(4), 395–417.

Courtney, S. J., & Gunter, H. M. (2017). Privatizing leadership in education in England: The multiple meanings of school principal agency. In: D. Waite and I. Bogotch (Eds.). *The Wiley International Handbook of Educational Leadership*. Hoboken, NJ: Wiley Blackwell, pp. 295–310.

Courtney, S. J., McGinity, R., & Gunter, H. M. (2018). Introduction: theory and theorising in educational leadership. In S. J. Courtney, R. McGinity, & H. M. Gunter (Eds.). *Educational leadership: Theorising professional practice in neoliberal times* (pp. 1–11). London: Routledge.

Crevani, L., (2015). Relational leadership. In: Carroll, Ford and Taylor (Eds.). *Leadership: Contemporary Critical Perspectives*. London: Sage, pp. 188-211.

Cunliffe, A. L., & Eriksen, M. (2011). Relational leadership. *Human Relations*, 64(11), 1425–1449.

DeJarnatt, S. L. (2013). Keep Following the Money: Financial Accountability and Governance of Cyber Charter Schools. *The Urban Lawyer*, 45(4), 915–951.

Deruy, E. (2016a, November). 5 things to know about Betsy DeVos, Trump’s pick for Education Secretary. *The Atlantic*. Washington D.C.

Deruy, E. (2016b, November 23). 5 things to know about Betsy DeVos, Trump’s pick for

- Education Secretary. *The Atlantic*. Washington D.C. Retrieved from <https://www.theatlantic.com/education/archive/2016/11/5-things-to-know-about-betsy-devos-trumps-pick-for-education-secretary/508661/>
- Eacott, S. (2015a). The principalship, autonomy, and after. *Journal of Educational Administration and History*, 47(4), 414–431.
- Eacott, S. (2015b). The (Im)possibility of 'leadership'. In: *Educational leadership relationally: A theory and methodology for educational leadership, management and administration*. Rotterdam: SensePublishers.
- Education Commission of the States (ECS) State Policy Database. (2017). Choice of Schools - Charter Schools - Cyber Charters. Retrieved from <https://b5.caspio.com/dp.asp?AppKey=b7f93000695b3d0d5abb4b68bd14&id=a0y700000000Cbm4AAC>
- Gill, B., Walsh, L., Wulsin, C. S., Matulewicz, H., Severn, V., Grau, E., ... Kerwin, T. (2015). *Inside online charter schools*. Cambridge, MA. Retrieved from http://www.mathematica-mpr.com/~media/publications/pdfs/education/inside_online_charter_schools.pdf
- Giroux, H. A. (2016). Donald Trump and neo-fascism in America. *Arena Magazine (Fitzroy, Vic)*, (140), 31–32.
- Goleman, D., Boyatzis, R., & McKee, A. (2002). *Primal leadership: Realizing the power of emotional intelligence*. Boston: Harvard Business School.
- Gunter, H. M. (2012). The Field of Educational Administration in England. *British Journal of Educational Studies*, 60(4), 337–356.
- Gunter, H. M., & Chapman, C. (2009). A decade of New Labour reform of education. In H. M. Gunter & C. Chapman (Eds.), *Radical Reforms: Perspectives on an era of*

- educational change* (pp. 1–13). Abingdon: Routledge.
- Gusterson, H. (2017). From Brexit to Trump: Anthropology and the rise of nationalist populism. *American Ethnologist*, 44(2), 209–214.
- Harvey, D. (2005). *A brief history of neoliberalism*. New York: Oxford University Press.
- Hasler, L., Barbour, M. K., & Menchaca, M. P. (2014). The Nature of Online Charter Schools: Evolution and Emerging Concerns. *Journal of Educational Technology and Society*, 17(4), 379–389.
- Hatcher, R. (2015). The transfer of local authority school support services to external social enterprises. *Journal of Educational Administration and History*, 47(4), 388–413.
- Hill, R., & Matthews, P. (2008). *Schools leading schools: the power and potential of National Leaders of Education*. Nottingham: National College for School Leadership.
- K12 Incorporated. (2017). K12 International Academy: Mission and Accreditation. Retrieved June 21, 2017, from <http://www.icademy.com/about/mission-and-accreditation.html>
- Kaufman, A. K. (2005). You're Fired!: Donald Trump, No Child Left Behind, and the Limits of Dissonant Leadership in Education. *University of Pennsylvania Journal of Law and Social Change*, 8(1), 1–26.
- Kinnick, K. N., & Parton, S. R. (2005). Workplace Communication: What The Apprentice Teaches About Communication Skills. *Business Communication Quarterly*, 68(4), 429–456.
- Leithwood, K., Harris, A., & Hopkins, D. (2008). Seven strong claims about successful school leadership. *School Leadership & Management*, 28(1), 27–42.
- Lubienski, C. (2006). School Choice and Privatization in Education: An Alternative Analytical Framework. *Journal for Critical Education Policy Studies*, 4(1). Available at:

< <http://www.jceps.com/archives/511>>.

Mann, B., & Barkauskas, N. (2014). Connecting Learners or Isolating Individuals?

International Journal of Cyber Ethics in Education, 3(2), 39–50.

Mann, B., Kotok, S., Frankenberg, E., Fuller, E., & Schafft, K. (2016). Choice, Cyber Charter Schools, and the Educational Marketplace for Rural School Districts. *The Rural*

Educator, 37(3), 17–29.

McGaughey, E. (2016). *Fascism-lite in America (or the social ideal of Donald Trump) (May 1, 2016)*. London. Retrieved from <http://dx.doi.org/10.2139/ssrn.2773217>

Morgan, H. (2016). Focus on Technology: Virtual Charter Schools in the United States.

Childhood Education, 92(1), 92–94.

Ravitch, D. (2017, May 23). Don't like Betsy DeVos? Blame the Democrats. *New Republic*.

Retrieved from <https://newrepublic.com/article/142364/dont-like-betsy-devos-blame-democrats>

Selwyn, N. (2011). *Education and technology: Key issues and debates*. London: Continuum.

Selwyn, N. (2015). Data entry: towards the critical study of digital data and education.

Learning, Media and Technology, 40(1), 64–82.

Thompson, G. (2017). Computer adaptive testing, big data and algorithmic approaches to education. *British Journal of Sociology of Education*, 38(6), 827–840.

Turner, C. (2017, February 4). Betsy DeVos' Graduation Rate Mistake. *nprEd*. Retrieved from <http://www.npr.org/sections/ed/2017/02/04/513220220/betsy-devos-graduation-rate-mistake>

Wenger, E. (1998). *Communities of Practice: Learning, meaning, and identity*. Cambridge: Cambridge University Press.

Whitty, G. (2016). *Research and Policy in Education: Evidence, Ideology and Impact*.

London: UCL IoE Press.

Williamson, B. (2016a). Digital education governance: data visualization, predictive analytics, and “real-time” policy instruments. *Journal of Education Policy*, 31(2), 123–141.

Williamson, B. (2016b). Silicon startup schools: technocracy, algorithmic imaginaries and venture philanthropy in corporate education reform [advance online publication]. *Critical Studies in Education*. <http://doi.org/10.1080/17508487.2016.1186710>

Williamson, B. (2017). Imaginaries and materialities of education data science. Paper presented at the Nordic Educational Research Association conference at Aalborg University, Copenhagen, 23 March 2017. Retrieved from <https://codeactsineducation.wordpress.com/2017/03/27/imaginaries-and-materialities-of-education-data-science/>