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Educational Technology and the Personalisation, Standardisation, Privatisation and Datafication of Education

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Preface

Education systems around the world are now witness to a variety of educational changes and improvements, numerous social and economic disruptions, and the onset of rapid technological advances that were unimaginable in the past. Within this tsunami of change, innovative teaching and learning practices that employ emerging technologies are sweeping into schools and classrooms with the broader goal of transforming student learning.

While technologies present education systems with both significant opportunities and challenges, some of the most profound developments are related to standardisation, personalisation, privatisation and the datafication of learning.

To this end, Education International (EI), the Alberta Teachers' Association (ATA) and the Canadian Teachers' Federation (CTF) identified a need to explore the interdisciplinary research underpinning technology-driven datafication and its effects on teaching and learning around the world.

This literature review attempts to provide a balanced view of the interdisciplinary concepts under investigation in order to inform an analysis of the converging fields of educational technology and datafication. It is part of a larger project entitled "We the Educators"

(www.wetheeducators.com), which brings the concepts explored in this research to life through video and animation in multiple languages.

It is hoped that this project will stimulate a rich public dialogue—and greater professional scrutiny—around the relationship between the datafication of education systems and the (de)personalisation, privatisation and standardisation of student learning. We invite colleagues and advocates for quality public education worldwide to draw on this research and to use the videos to continue the conversations.

This project is the result of a global collaborative effort of many talented people, including Graham Brown-Martin and teams from EI (Angelo Gavrielatos, Nikola Wachter and Mar Candela), the ATA (Dr Philip McRae, Dr Lindsay Yakimyshyn and Dr J-C Couture) and the CTF (Cassandra Hallett and Bernie Froese-Germain). The collective attention, analysis, support and imagination provided by all of these people have brought to life a project with the intention to inform and help to (re)shape the future of teaching and learning.

All of the partners in this project will continue to research and advocate for the conditions of professional practice required to create teaching and learning environments that advance the goal of strong publicly funded public education systems: to educate all children and youth well.

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Educational technology, as well as the data it can produce, has great potential to assist in personalising education and supporting learners. Yet this potential needs to be studied in relation to the privatisation and standardisation of education occurring around the world. This project, entitled "We the Educators," examines the handshake between educational technology and the datafication of learning, and how these forces can influence the depersonalisation of learning and the deprofessionalisation of teaching. The purpose of this literature review is to establish a foundational understanding of the interdiscursive nature of this issue by reviewing the literature surrounding standardisation, personalisation, privatisation, and educational technology and the datafication of learning.

Conducting this literature review reinforced the many connections and tensions between standardisation, personalisation and privatisation. These three concepts are not discrete but

convergent. This literature review begins to put the concepts and the research that addresses them in conversation. At the same time, prioritizing brevity, this research review—which has informed the "We the Educators" videos that address these concepts through visual narrative—is not intended to be comprehensive.

The objective of this literature review was exploratory in nature, and because of the depth of the literature (both academic and nonacademic) available on standardisation, personalisation and privatisation, this review focuses primarily on scholarly articles and books published in the past decade. Taken together, this research attempts to provide a balanced view of the concepts and may begin to inform an analysis of the converging fields of educational technology and datafication, as well as become an impetus for ongoing research. Select nonacademic texts that provide valuable insight into the subject have also been considered. In reviewing the literature, questions surrounding accountability and the place of technology and data in learning arise. This investigation into technology-driven datafication and its effects on teaching and learning around the world is preliminary and limited in part by its interdisciplinary nature. At the same time, the relationship that begins to emerge here between the datafication of learning and the personalisation, privatisation and standardisation of student learning begs attention and further scrutiny.

Standardisation

Standards in education have the potential to both promote and threaten equity. While standards can manifest in education through, for example, curriculum, learner paths and assessments, they have come to primarily denote "specifications of what should be learned and assessed, open to public scrutiny and, thus, a means of holding both teachers and the education system accountable" (Lepota and Murray 2014, 6). The terms *standards*—such specifications—and *standardisation*—a systematic implementation of such specifications—have been analysed by proponents and detractors, with definitions of the concepts often becoming nuanced to underscore the potential benefits and issues associated with them. On the one hand, some advocates (such as McClure 2005) claim that standardisation improves accountability and transparency, particularly in terms of the distribution of resources. Further, standards, when implemented fairly with the appropriate context in mind, can establish clear and productive expectations for students, teachers and education systems (Lepota and Murray 2014). But to what extent is transparency of inherent value (Morozov 2013)? Moreover, does too much focus on outcomes call into question the purpose of education (Biesta 2010)?

Some critics (such as Skerrett and Hargreaves 2008 and Tröhler 2014) suggest that standardisation inhibits appreciation of, or responsiveness to, student diversity and

exceptionalities (for example, students with special needs or students learning the language of instruction). In part, this is because effective teaching cannot be "carr[ied] out by following standard procedures" (Hargreaves and Fullan 2012, 78). In addition, in reducing variety, standardisation reduces choice (Blind 2013). Mike Rose (2010, 23) observes the limitations of standards, noting that they "can be used to limit access and stratify students into educational tracks, or can lead to an overly prescriptive and narrow curriculum" that can impede both teacher autonomy and student success. Youngjoo Kim (2010, 18) goes as far as to disparage standardised learning and assessment practices as "cognitive deforming and intellectually stunting."

Given these criticisms, it is notable that standardisation was an attempt to address achievement gaps, specifically related to race and socioeconomic status, in the United States in the 1970s, '80s and '90s (McClure 2005). The emergence of the ambiguous notion of personalised learning in the same decades as the standardisation movement indicates that standardisation might have been, at best, limited in supporting all students.

Personalisation

James W Keefe (2007) suggests that the shift toward personalisation is connected to the special education movement and work undertaken by the Model Schools Project and the Learning Environments Consortium International in the 1960s and '70s. Drawing from previous research on the subject, Keefe describes *personalisation* as

> an attempt to achieve balance between the characteristics of the learning environment, between what is challenging and productive and what is beyond the student's present capabilities. It is a systematic effort on the part of a school to take into account individual student characteristics and effective instructional practices in organizing the learning environment. It is a learning process in which schools help students assess their own talents and aspirations, plan a pathway to meet their own purposes, work cooperatively with others on challenging tasks, maintain a record of their explorations, and demonstrate their learning against clear standards in a wide variety of media, all with close support of adult mentors and guides. (p 221)

The concept of personalisation has been defined in similar ways by various scholars, though divergent emphases emerge: differentiated instruction and assessment (McRae 2010), teacher–student relationships and school climate (McClure, Yonezawa and Jones 2010), and conceptualisation versus implementation (Campbell et al 2007), for instance. Importantly,

McRae (2014) asserts that "personalized learning is neither a pedagogic theory nor a coherent set of teaching approaches; it is an idea struggling for an identity."

What resonates through most scholarship is the point that effective personalisation requires teachers to develop an understanding of their students' unique needs, talents and interests and to then respond with appropriate strategies to facilitate learning in environments where knowledge is inquiry oriented and socially constructed. Further, this vision of effective personalisation is consistent with the learning sciences and empirical research on how people learn:

> [In socio-constructivism] learning is understood to be importantly shaped by the context in which it is situated and is actively constructed through social negotiation with others. On this understanding, learning environments should be where constructive, self-regulated learning is fostered; the learning is sensitive to context; [and] it will often be collaborative. (Organisation for Economic Co-operation and Development 2010, 3)

Keefe (2007, 222) emphasises the vital role of the teacher—who "focuses on student development, motivation, and success"—in personalising learning. The benefits of this type of tailored learning are evident: personalisation is connected to improved academic achievement, school culture and student engagement, particularly when students perceive the personalisation in their schools (McClure, Yonezawa and Jones 2010).

Following the articulation of personalised learning in the United Kingdom in 2003, David Hargreaves (2006) contributed to the conversation on personalisation by outlining nine gateways to personalising learning. In his work, he attempts to diminish the connection between personalisation and corporatisation. Yet scholars such as Andy Hargreaves and Dennis Shirley (2009, 84) criticise the concept of personalised learning as "just one more process of business-driven training delivered to satisfy individual consumer tastes and desires." David Hartley (2007) similarly decries personalisation as a marketisation of education. Like targeted marketing online, automated personalised learning—though certainly customised—limits users' exposure to a variety of subjects, ideas and arguments that could challenge and expand their capacity for critical thinking. Therefore, while it seems to offer students greater agency, personalisation—when detached from the teacher–student relationship and appropriated for private interests—has the potential to narrow learner pathways and to undermine the critical role teachers play in fostering critical thinking and the social processes (Vygotsky 1978) that are instrumental to the building of intra- and interpersonal knowledge (Davis 2004, 122). Affirming the points made by Hartley, as well as by Hargreaves and Shirley, notable tensions between personalisation and privatisation emerge as agency and opportunity become the selling points of the personalisation and the privatisation of education. Moreover, edu-businesses, such as Pearson and McGraw-Hill, promote the capacity for their tools to encourage student success by adapting to the user, as they try to establish a link between personalisation and privatisation.

Privatisation
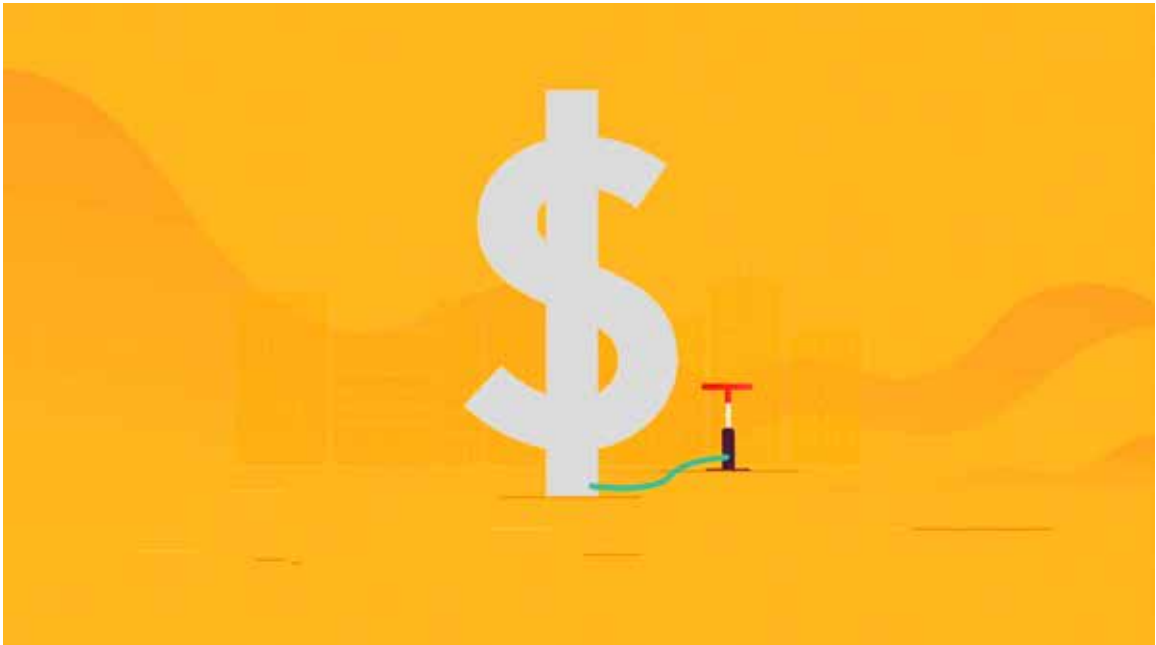
Privatisation emerged as a neoliberal concept that touts parent choice and personalisation but, at the same time, is rooted in market competition and standardisation. As with standardisation, privatisation has its supporters and its critics. Debate over privatisation versus public investment has occurred through case study analysis (Adamson, Åstrand and Darling-Hammond 2016) but also through more conceptual examinations of economics, equity and accessibility. Proponents of privatisation suggest that the model promotes competition, improves quality of education, creates greater choice and access for parents and students, and takes the financial burden off the state (Patrinos, Barrera-Osorio and Guaqueta 2009; Fielden and LaRocque 2009). Others view private, commercial interests in education as threatening equity, the public school system, the future of teaching and democracy (Cortez 2013; Menashy 2013; Hinchey and Cadiero-Kaplan 2005; Molnar and Garcia 2007; Ichilov 2012; Verger, Fontdevila and Zancajo 2016). Menashy undermines arguments that favour privatisation, questioning the extent to which the model actually improves educational accessibility:

> Choice . . . is a concept that should not be confused with agency, or opportunity. . . . If human well-being were to be assessed on a person's choices, then all must have equality of choice. However, in the case of, for instance, low-fee private schools, only those families with means to pay the fees are able to enjoy this choice. (pp 20–21)

A report of the Organisation for Economic Co-operation and Development (2012, 64) similarly argues that, rather than promoting "high quality schooling for all," "choice and associated market mechanisms can enhance segregation." As this suggests, social justice issues should be considered in relation to school governance models (Robertson and Dale 2013; Tooley 2013; Levin, Cornelisz and Hanisch-Cerda 2013). Yet, even when acknowledging the unequal distribution of student opportunity that arises with privatisation, some critics assert that private funding has a place in education. In particular, Fazal Rizvi (2016, 8–10) argues that privately funded education is inevitable; at the same time, he stresses the need for regulation and "reassertion of the social democratic goals of education" (more than accountability measures or public–private partnerships) to mitigate the unequal distribution of student opportunity.

Inextricable from privatisation, the movement toward charter schools and voucher programs is viewed by some scholars with concern and skepticism.[1] Choice is a key selling point of charter schools and vouchers, and some proponents suggest that these alternatives to public education have the potential to promote social justice (Sweetland 2014). Yet, to reiterate Menashy's (2013) point, parental choice differs from student opportunity. Examining equity—a criterion of social justice—in the education system of the Netherlands, Henry M Levin, Ilja Cornelisz and Barbara Hanisch-Cerda (2013, 526–27) conclude that some prevailing inequities stem from the country's voucher program, "where parents choose schools that mirror their own religion, ethnicity and socio-economic identities." Many critics of charter schools and vouchers stress that commercial, private interests take precedence over the students' interests. Ravitch (2014, 178) characterises the charter movement as "a vehicle for privatization of large swaths of public education."[2] More notably—because it challenges another argument for private interests in education—the success of charter schools and voucher programs is, at best, inconsistent (Berliner, Glass and Associates 2014; Carey 2017), and research shows little correlation between the competition promoted by privatisation and academic achievement (Ellison 2012). Aside from concerns related to equity, student opportunity and academic achievement, the companies that run private schools can fold, leaving parents and children—their customers—in the lurch (Pollard 2013).

But the privatisation of education continues. For edu-businesses like Pearson, this work entails the "generat[ion] and appropriat[ion] of various data to legitimise its products and services" (Hogan, Sellar and Lingard 2015, 243). Accountability (often in the form of standardised testing) becomes central to this model of education, as private schools and edu-businesses answer to their consumers—the state, the parents, the students. Indeed, private interests in education create space—if not demand—for increased accountability (Kohn 2004) and data collection.

Educational Technology and Datafication

Technology plays an important role in the standardisation, personalisation *and* privatisation of education (Hinchey and Cadiero-Kaplan 2005; McRae 2010). Technology not only facilitates standardised testing and programs but can also be positioned as *the* agent to personalise learning. In addition, the potential of educational technology to address individual learners' needs and support inclusion makes partnerships with private companies that can bridge digital divides appealing to some (see, for example, Charania and Davis 2016). While some scholars are concerned about the rise of individualism amplified by technology, wherein children and youth are fragmented by continuous partial attention and often found "alone together" (Turkle 2011), others envision technologies being used in ways that can help students become empowered citizens rather than passive consumers (McRae 2015). Teaching and learning with technology is a dynamic, challenging and creative act, as teachers must traverse the elements of content, pedagogy and technology and understand how they interact in the context of a learning model (Koehler and Mishra 2009). To employ technologies to their best potential, teachers must work to reconcile the complexity and dynamics of student learning as it relates to technology.

The vast possibilities and opportunities that educational technology offers must be considered in relation to potential issues, particularly with respect to data collection, student privacy and, in fact, the depersonalisation and deprofessionalisation of education. With a wider cultural shift toward the acquisition and analysis of data via digital technologies, questions emerge regarding data collection related to student and school performance. Who owns it, who has access to it, and how is the data used? Further, how much data on students, teachers and schools needs to be collected?

Concerns regarding privacy stem from commercial interests in educational spaces, as the technologies used by school districts and edu-businesses enable them to collect, analyse and sell student data (Boninger and Molnar 2015; Reyes 2015). Faith Boninger and Alex Molnar (2015, 3) argue that "because digital technologies enable extensive personalisation, they amplify opportunities for marketers to control what children see in the private world of their digital devices as well as what they see in public spaces." While some (such as Thompson 2015) attempt to minimise the privacy issue, the literature on big data raises concerns regarding the privacy of the user with notable consistency (see, in particular, Pence 2014).

Though defined in more nuanced ways, *big data* refers to huge, complex data sets that can be processed only by powerful computer tools.

The potential of big data cannot be overstated. It "facilitates knowledge-shifting and knowledge-expansion by revealing and opening up new possibilities, ideas, facts, and actions that, previously, were concealed or inaccessible because, in part, of smaller data sizes" (Kosciejew 2013, 52). Yet, to find answers concealed in big data, a researcher must know the right question to ask; the researcher's approach, mindset and biases in relation to a data set are key (see Mayer-Schönberger and Cukier 2013 and O'Neil 2016).

Data gathering in the education field is accelerating, providing stakeholders with access to huge amounts of digital data on students (Reyes 2015). As student data grows through digital testing, reporting and assessment, so does the desire to harvest it for patterns. With more powerful computing technologies, large data sets may even hold the power of prediction—a predictive analytics achieved through the use of big data.

Digital reporting, assessment and behaviour management tools offer instant feedback to parents and teachers regarding student performance, thereby better enabling them to offer customised support to children. However, on a larger scale, the data can be mined by private companies for the purpose of marketing and selling to parents, teachers and students (Boninger and Molnar 2015). Though limited because of lack of contextualization, large-scale data sets are employed by companies to recognise and address trends and issues. At the

same time, the ability of private companies to access data without explicit user consent and understanding raises ethical questions and demonstrates the need for the law to catch up to practice (Pence 2015; Fredrick 2014). And concerns regarding privacy are real (Watters 2017). For instance, InBloom, a data-analytics company backed by grants from the Bill & Melinda Gates Foundation and the Carnegie Corporation of New York, was intended to provide secure data storage linked to personalised learning software to states and school districts. Only a few months into operation, InBloom held

> files on millions of children identified by name, address and sometimes social security number. Learning disabilities are documented, test scores recorded, attendance noted. In some cases, the database tracks student hobbies, career goals, attitudes toward school—even homework completion. Local education officials retain legal control over their students' information. But federal law allows them to share files in their portion of the database with private companies selling educational products and services. (Simon 2013)

Amid concerns about how student data was being stored and employed, InBloom shut down. Beyond implications related to ethics and privacy, big data's relationship to the datafication of education also begs consideration.

Datafication is defined as "a process of transformation, taking any and all aspects of the world and turning them into data" (Kosciejew 2013, 52). Big data enables datafication. How does this transformation affect education? How does it affect teachers and, most important, students? Questions related to self-identification and depersonalisation emerge when students become data. Marc Kosciejew speaks of a loss of "self" connected to datafication. In specific relation to students, Guy Roberts-Holmes and Alice Bradbury (2016, 124) suggest that "young children could become reduced to the school's statistical 'raw materials' that are mined and exploited for their maximum productivity gains." Such issues surrounding student identity and performance require further examination. In addition, the implications for teachers demand consideration. For instance, how does the construction of the student as data affect teachers' practice? Could datafication lead to alienated teaching, wherein teachers overlook their own professional judgment to meet externally imposed performance expectations (Shirley and MacDonald 2016)? Roberts-Holmes and Bradbury connect performance data and increased governance to the limiting of teachers' autonomy and the constraining of "democratic pedagogical spaces, visions and possibilities" (p 127). It is notable that the concerns about the loss of the student's "self" and the potential constrictions on autonomy resonate with the suppression of individuality and the stratification of students that Kim (2010) and Rose (2010), respectively, connect to standardisation.

While sometimes linked to a market-driven approach to education, the emphasis on data in education primarily stems from calls for accountability. The collection, analysis and use of relevant data in education can be productive and provide insight into system or student performance. At the same time, technology enables the collection of big data, which can eschew context and lead to the datafication and depersonalisation of education. Schools, teachers and students operate in a performativity culture that wants "proof" of student success (Roberts-Holmes and Bradbury 2016). Rather than leading to "more empowered, creative and democratic organizations," the shift toward privatisation and increased accountability has resulted in the emergence of "the *performing school*, [in which] school staff must continuously compete, advertise and perform in order to assure a thriving institutional and professional future" (Falabella 2014, 16). Can emphasis placed on accountability measures and related outcomes be reconciled with the personalisation that edu-businesses, charter schools and voucher programs publicise? Can accountability regimes relate to *both* standardisation and personalisation—concepts that are seemingly in opposition?

Depersonalisation and Deprofessionalisation

The sort of accountability measures tied to the standardisation and privatisation of learning—and, less explicitly, to personalised learning—link to the big data and datafication movements. Collected and interpreted appropriately, student data can help teachers and parents support student success. At the same time, Audrey Watters (2017) contends that much of the value of "data collection and data analysis," particularly in relation to personalisation, "remain[s] primarily marketing hype." An examination of big data and datafication in relation to education, then, (re)exposes the tensions between personalisation (which focuses on the individual needs of the student), privatisation (which emphasises customisation to individual student needs, but with an interest in accountability) and standardisation (which stresses accountability more than individual student needs).

The "We the Educators" project highlights these tensions by examining how educational technology and the datafication of learning have resulted in increased pressures to standardise learning, narrow curricula, depersonalise student learning and, ultimately, undermine and deprofessionalise teaching in many parts of the world. The deprofessionalisation of teaching

is already occurring on an extreme level in countries in the Global South, where Bridge International Academies employs "teacher-computers" and an "Academy-in-a-box" model, privileging company profits over student interests (Riep and Machacek 2016). Educational technology, though full of promise, enables this.

Educational technology and the associated production of data hold great potential in terms of supporting individual learner needs. But the relationship between educational technology, data, personalisation, privatisation and standardisation needs to be considered with care; the potential for harm must not be overshadowed by the hype, and the broader purpose of education must not be lost.

Notes

1. Pasi Sahlberg (2016), who coined the term GERM (*Global Education Reform Movement*), notes that choice has several manifestations that vary from one educational system to another, and this includes school or parental choice (such as charter schools, academies and voucher programs). Other features of GERM (which overlap with some of the concepts explored in the literature review) include increased competition between schools for student enrolment; standardisation of teaching and learning in schools; increasing importance of reading literacy, mathematics and science in schools, often at the expense of arts, music, physical education and social studies; and test-based accountability (holding teachers and schools accountable for students' achievement through external [large-scale] standardised tests).

2. This links to Chomsky's (2011) suggestion that the standard technique of privatisation is to "defund, make sure things don't work, people get angry, you hand it over to private capital."

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