Digital data in education policy

The use of statistical data has been a feature of education systems for over a century. Today, digital systems for the collection, calculation and communication of vast quantities of data are reshaping educational policymaking itself.

Exhibiting data

By the end of the 19th century, data played a large role in the measurement, comparison and evaluation of education systems. Exhibitions staged by government departments at the Great Expositions made education visible through numbers, graphs and diagrams. Government decision-makers of the time were able to use these exhibitions as a way of comparing successful approaches.

> Digital data systems enable vast quantities of educational data to be collected, calculated and communicated in order to inform decisions and policies

Today the exhibition of educational data persists in the form of enhanced data visualization. The graphical display of educational data depends on sophisticated databases that are used to collect, calculate and communicate data to diverse audiences.

Notable examples include the National Pupil Database, containing data on over 7 million UK pupils at all stages of schooling since 2002. The NPD is presented in spreadsheet files as thousands of rows of numbers that can be searched, analysed and used to generate complex graphical displays.

The NPD is a statistical device for exhibiting large-scale educational data in order to inform governmental policy and analysis.

Schools are also increasingly displaying their own data through data dashboards. In England, Ofsted and the Department for Education promote the use of school dashboards for reporting progress and accountability purposes. In Scotland, the Insight dashboard allows schools to benchmark their performance against 'virtual comparators' as part of their improvement processes.

More spectacularly, in 2012 the commercial company Pearson launched The Learning Curve, a massive databank of internationally comparable educational datasets from over 60 countries. The Learning Curve presents a graphical 'Global Index' of nations ranked by educational performance. It features dynamic, interactive and user-friendly data visualization tools that allow countries to be compared and evaluated in graphic form.

> Data visualization makes it possible to turn complex educational data into simplified graphical displays that can be used as part of evaluation and improvement processes

Digital data technologies have become powerful techniques of political visualization for exhibiting and comparing the global educational

landscape, enabling numbers to be presented in simplified form to shape policymaking.

Data expertise

The collection of large scale and digital educational data requires new forms of technical, methodological and analytical expertise.

> The challenges of working with data have demanded new organizations with technical, methodological and analytical expertise in digital data analysis and presentation

Government departments of education routinely deal with vast quantities of data. School leaders, too, are under pressure to collect, process and display the data that are required to demonstrate progress on measurable criteria of assessment and evaluation. New independent centres of data expertise are also emerging to make sense of educational data.

The Education DataLab was established in 2015 as the UK's independent centre of excellence for quantitative research in education. It focuses its expertise on analyses of large scale educational datasets in order to improve education policy.

The Education DataLab is indicative of how the analysis of educational data is being distributed to new centres of technical expertise that are able to translate massive data resources into actionable policy insights through advanced digital methods of data analysis and presentation.

'Real-time' analytics

The potential of using 'big data' generated through digital learning activities has prompted the possibility of automated, real-time data analysis.

The commercial company Pearson established the Center for Digital Data, Analytics and Adaptive Learning in 2012. Dedicated to using digital data for educational improvement, it explores how data generated by students' interactions with digital learning activities can be analysed in order to personalize learning.

> Developments in big data analytics have been proposed for new forms of 'real-time' analysis and the generation of 'actionable insights' about learning

The centre challenges existing data-led practices which concentrate on the collection of test data, and instead emphasizes real-time data processing. The potential of big data practices in education is to accelerate the generation of actionable insights that might be used to improve practices and processes.

Big data vs bureaucracy

Dynamic big data processes are intended to bypass the slow-paced bureaucratic practices of government measurement and improvement. Instead, well-resourced centres of technical expertise such as Pearson are positioning themselves as providers of systems that can process data, and then generate recommendations for personalized learning tasks and pedagogic interventions in real-time.

> Dynamic big data systems are being positioned as the solution to slow bureaucratic government processes of educational measurement and improvement

The possibility of real-time big data processing appears to make it possible to govern education without government bureaucracy. New technical and methodological experts of digital data analysis are now exerting authority over educational knowledge production and intervention.

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