

## Rohan Sandhu & Subir Gokarn: E-ducating India - Technology is just one piece of the puzzle

**The data-generation ability of technology can not only provide real-time feedback on its return on investment but also evaluate education programmes**

**Rohan Sandhu & Subir Gokarn** September 28, 2014 Last Updated at 22:46 IST



In two prominent speeches over the past month, Prime Minister Narendra Modi has emphasised his ambition to digitalise education, viewing technology as a means to improve access to quality learning. This is consistent with his government's previous pronouncements about making schools e-enabled, rolling out broadband highways, and preparing children for a knowledge society, as well as budget allocations towards virtual classrooms and online courses. While digitalising education is clearly a goal, the challenge for the government now is determining how this will be realised, while fully understanding the scope of technology in transforming the **education** sector.

In terms of access-related issues, the World Economic Forum's Networked Readiness Index (NRI) highlights some of the obstacles pertaining to the expansion of technology and communication infrastructure, broadband development, and growth of information technology-enabled industries. Unable to exploit the opportunities provided by its low broadband and phone tariffs, competitive local markets, and access to venture capital, India is currently ranked 83rd among 148 countries - falling 15 places from 2013. The lack of digital infrastructure, electricity shortfalls, low production and individual use of technology, are some of the most significant impediments. Additionally, India ranks near the bottom for its business and innovation environment, owing to a political and regulatory apparatus characterised by red tape and high corporate taxes.

In the education space, the ability to exploit the advantages of information and communications technology (ICT) is also hindered by various information gaps in the market for technological innovations. So far, the identification and scaling of best practices has largely been left to venture philanthropists and incubators, resulting in scattered initiatives that often reinvent the wheel. For technology to have larger system-wide implications, a regulatory framework that links consumers and suppliers of education technologies, provides information about what technologies exist, establishes standards, and scales best practices, is required. In this context, the United Progressive Alliance government's 2012 *National Mission on Education* sought to create a clearing house-cum-rating agency for web-based learning material and a rating institution for knowledge content on the internet - ideas the new government must build on. The need for such agencies has also been a prominent part of discourse in other parts of the world. Chatterji and Jones (2012), for instance, make the case for a third-party rating agency in the US, to test various instructional technologies and disseminate information on effectiveness.<sup>1</sup>

Access to technology, however, is only one piece of the puzzle. We need to demystify the concept of "e-enabled" schools, and determine clear goals and objectives for the introduction of ICT in education. Conversations around technology in India have so far paralleled those on education more generally - prioritising investments and access over experience and outcomes. Most policy documents have viewed technology either as a substitute for teachers where the traditional education system is unavailable, or through the narrow lens of "technical skills for

a knowledge society". But if technology is mainstreamed, its objectives must evolve beyond this, and be directed at effecting a more profound change in the system.

In this context, the data-generation ability of technology offers a unique opportunity to not just provide real-time feedback on its return on investment, but also to evaluate the effectiveness of education programmes. At the micro level, technology-aided tools provide information about academic performance to students, teachers, and parents, allowing teachers to assess the response to different pedagogic approaches. The Social Networks Adapting Pedagogical Practice or SNAPP tool, for instance, analyses discussion forum activity within various open learning management systems, providing teachers information on disconnected students, low and high performers, and "before and after" metrics to assess the impact of teacher-interventions.

Darrell West (2012) of the Brookings Institution provides examples of data mining techniques similarly employed to identify at-risk students, in schools in 16 states across the US<sup>2</sup>. Analysts have been able to identify students who drop out, using prediction models based on truancy, disciplinary problems, changes in course performance, and overall grades. In India, social enterprises such as Zaya and Mindspark fill this space, providing platforms for online-testing, following which reports on individual student performance are made available to teachers.

Eventually, if this feedback is constructively looped back into the education process, it allows pedagogy to be individualised, facilitating a democratisation of the education process. On the macro level, the measurement of outcomes serves as a guide for policymakers, facilitating increased accountability and performance. Mayer-Schönberger and Cukier (2014) summarise these benefits of technology, writing that data generated by technology should be used in education, just as it has in fields such as retail and advertising - to provide feedback about what approaches work best, and allow customisation based on individual needs.<sup>3</sup>

There are then at least three frontiers to consider while mainstreaming technology in education - access and infrastructure, the technological innovations market, and the measurement of impact. Particularly in the third area, technology may be leveraged to resolve a much larger and significant challenge, nudging the education system from a focus on inputs and investments, to quality and outcomes.

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1. Chatterji, A., & Jones, B. (2012). *Harnessing Technology to Improve K-12 Education*. Hamilton Project.
2. West, D. M. (2012). *Big data for education: Data mining, data analytics, and web dashboards*. Brookings Institution.
3. Mayer-Schönberger, V., & Cukier, K. (2014). *Learning with Big Data: The Future of Education*. Houghton Mifflin Harcourt