



## Leveraging technology to strengthen education and skills development for the future: Cases from India

---

### INTRODUCTION

BRICS countries collectively comprise 40 percent of the world's population (Statista, 2014). However, what truly defines this shared commonality among the nations is the diversity of population, culture and languages within the borders. India has 28 States and 8 Union Territories and according to the latest Census (2011), more than 19,500 mother tongues are spoken in India (Indian Express, 2018). Similarly, Africa is home to about one-third of the world's languages with about 1,000 to 2,000 languages (Harvard University, n.d). These manifest the most in education policies and programmes that need to accommodate the regional heterogeneity while

also adhering to the national standards. Hence, the issue of relevance in education becomes one of the key considerations for policymakers while designing strategies and guidelines for the youth that represent these diversities.

The sixth BRICS Summit, held in Fortaleza, Brazil, in July 2014, affirmed the "strategic importance of education for sustainable development and inclusive economic growth" and pledged to strengthen cooperation (Ministry of Foreign Affairs, PR to China, n.d.). BRICS 2022 resolution also emphasised that countries must share the experiences and best practices of implementing the Education 2030 Agenda to promote education equity, quality, and lifelong learning.

India has dealt with these regional diversities through several innovative education and skills initiatives (Education Commission, 1964–66; Ministry of Education 1968; 1992). Akin to India's rich tradition and culture, South Africa too has traditional knowledge systems that need to be advocated for while also keeping up with contemporary systems of futuristic education. India's National Education Policy (NEP) (Ministry of Education, 2020) is a remarkable

example in this respect, which strikes a fine balance between India's traditional systems of knowledge while also advocating for digital education and skills that are needed to partake in the future of work.

### IMPLEMENTING POLICIES INTO PRACTICE

As a nation, it is important for countries to create inclusive opportunities for the youth of the country where policymakers understand the lived realities and aspirations of the youth while designing not only overarching policies but also programmes. This stands especially true for skilling programmes, where employability and employment are the primary outcomes.

Referring back to aforementioned India's NEP, it is a forward-looking document that has considered the ever-changing nature of employment, and recommended including new age skills at the school level, with multiple entry and exit options. "Beginning with vocational exposure at early ages in middle and secondary school, quality vocational education will be integrated smoothly into higher education. It will ensure that every child learns at least one vocation and is exposed to several more. This would lead to emphasising dignity of labour and importance of various vocations involving Indian arts and artisanship," states the NEP (Ministry of Education, 2020). Various other BRICS nations face similar problems of varied levels of importance accorded to vocational and mainstream education.

In India, earlier, students who opted for vocational education in their high school, would not be able to transition seamlessly to higher education with the vocational field, until the National Skills Qualifications Framework (NSQF) was introduced in 2013 (Ministry of Education, 2013). The NSQF devised ways to ensure vertical mobility of students who opt for vocational tracks – ensuring they can continue further into higher education, pursue various chosen vocations as well as become employable. This will not only help them to progress in their careers but also contribute to personal growth, upskilling and lifelong learning – making vocational education aspirational for the youth of the nation (Pilz & Regel, 2021).

As per NEP, in order to make skills training available and accessible to the youth of the country, the government has proposed to develop skill labs in schools in a Hub and Spoke model, so that other schools can also utilise the facility. The idea is to be able to use shared resources and accord accountability to each partner stakeholder to maximise outcomes.

Parallel to the formal education system, in order to reap the benefits of India's demographic dividend, the Government of India has also introduced several short-term skills training programmes, in order to "Transform rural poor youth into an economically independent and globally relevant workforce" (Press Information Bureau, 2023).

Experts point towards an expected global shortage of 56 million young people (15–35 years) in the world (Chakravorty & Bedi, 2019). Given the share of the BRICS's population in the world, in the coming decade, our countries will be the hub for skills talents for the world. Hence, it is important to think before the demand arises and train our youth in skills that will make them employable in the markets of the future.

### LEVERAGING TECHNOLOGY TO STRENGTHEN SKILLS DEVELOPMENT

Traditionally, manufacturing and agricultural skills have been imparted to students as part of vocational programmes, however, to be able to elevate the youth from their immediate socio-economic circumstances, it is important to skill them in new age competencies - not only professional skills but also transferable skills. This will help them become amenable to jobs that are dynamic in nature. For instance, soft skills, IT skills and AI-driven skills. While content is important, it has become pertinent to train students in a way that makes them adaptable to the ever-changing world of digital evolution.

As per the India Skills Report (Wheebox, 2023), most hiring will be in the area of automotive, engineering and internet businesses, and that there is an increased demand for 'niche skills' that are technology-driven. However, this demand for talent is mostly from the urban cities as they are driving digital acceleration.

Owing to advancing technology, the nature of employment is constantly evolving, and this requires continuous upgradation, value addition and induction in new-age skills for the youth, especially from the underserved areas – to ensure equity in opportunities.

Recently, the Central Board of Secondary Education in India introduced coding and artificial intelligence (AI) for students to promote skill education among students (India Today, 2023). This includes modules on data science, Augmented Reality (AR), financial literacy, coding, satellite applications, among others. The aim is to formalise skilling in schools.

We are in the era of the Fourth Industrial Revolution

**"Experts point towards an expected global shortage of 56 million young people (15–35 years) in the world (Chakravorty & Bedi, 2019). Given the share of the BRICS's population in the world, in the coming decade, our countries will be the hub for skills talents for the world."**



and it is often defined by “connectivity, advanced analytics, automation, and advanced-manufacturing technology” (McKinsey & Company, 2022). The available and evolving technology can be most efficiently used for knowledge sharing and capability building. As there are more digital tools, there is a need to equip the young workforce with the knowledge and understanding of these – so as to create agile learners who can adapt to the future of work.

This is where BRICS countries can collaborate, create a digital network of institutions and share best practices on upskilling and reskilling from their regions. While physical labs are expensive and sometimes inaccessible, digital skill labs can provide convenient solution to tackle the problem of accessibility and availability.

Although the skill programmes need to be demand-driven, they also need to be student-centric

so as to provide agency to the students to break the barriers of their immediate socio-economic cycles and explore diverse livelihood opportunities.

The pandemic intensified the need for transformational learning using digital technology. Several innovative EdTech solutions were experimented with and as we complete three years and post several impact evaluations, it is seen that only the most relevant, research-driven solutions stood the test of time. It has helped us to understand that it is necessary to design tech solutions that make use of a bottoms-up approach in building trust within the community of users, to ensure efficient and effective usage of the solutions for desirable outcomes.

#### **INNOVATIVE SOLUTIONS FROM INDIA**

There are various models of delivery of education in India, some traditional but others more innovative



**“BRICS nations need to collectively develop platforms and avenues where these best practices can be shared, and the youth can access opportunities across borders.”**

who are trying to integrate the traditional ways of teaching with the needs of the 21<sup>st</sup> century workforce.

At Reliance Foundation (2023), for example, education and skilling is approached in the most holistic manner – starting from early childhood education until postgraduate levels:

*Reliance Foundation uses a two-pronged approach to accelerate India's educational quotient, through initiatives spanning primary, secondary and tertiary education – a) Developing world-class institutions that serve as models to transform and strengthen the country's education system, b) Nurturing India's youth and future global leaders to develop solutions to India's challenges and, in parallel, ensuring equitable access to education for all.*

The above is approached by Reliance Foundation in alignment with the Sustainable Development Goals (SDGs).

For example, the Reliance Foundation offers various scholarships, including in Artificial Intelligence and Computer Science to marginalised students, female scholars as well as specially-abled youth. Jio Institute, under the Foundation, offers world class programmes in advanced AI skills so as to prepare students for the opportunities of tomorrow, including entrepreneurship skills to drive economic growth.

While there are prominent organisations that are experimenting with innovative ways, there are also smaller start-ups, in India, that are redefining the way education and skills are imparted to children in schools and higher education institutions. These include the following organisations' programmes.

#### **Pi Jam Foundation**

Their intention is to make technology accessible to lower income schools in India (Pi Jam Foundation, n.d.). Conceived by a young Teach for India Alumni in 2017, Pi Jam Foundation aims to provide students from under-resourced schools with computing and problem-solving skills. They focus on these skills so that school-going children are well equipped when transitioning to the job market.

#### **Agastya International Foundation**

This foundation uses experiential, and design-thinking based projects to teach science to the economically disadvantaged children and government schoolteachers in India (Agastya

International Foundation, n.d.). In one of their innovative initiatives, they created mobile labs in buses to reach as many children as they could. However, due to difficult terrain and accessibility issues, when they couldn't reach the remotest of regions in India, they innovated and used the mobile van concept for a motorbike, which is driven by one of their instructors. These bikes are well equipped with laptops, portable internet connection, with access to language-neutral science videos, and quizzes. It contains simple hands-on experiments that teach scientific concepts in a simple and engaging manner. These concepts have been adapted to create a “Math Lab-on-a-Bike” and “Electronics Lab-on-a-Bike”, which helps children get over the fear of Math, and teaches the know-how of modern electronics in an increasingly digitised world.

#### **Lend a Hand India**

This is a non-profit organisation, that similarly, runs a programme called ‘Skills on Wheels’ that is a mobile lab, which is used to deliver career counselling for 10<sup>th</sup> and 12<sup>th</sup> Class students, and vocational skills training to students in remote areas with limited infrastructure (Singha, 2018). It is equipped with wi-fi, audio visual facility, and a generator – where vocational trainers deliver training in areas such as welding, plumbing, electrical wiring, food processing, basic healthcare and mobile repair.

#### **THE WAY FORWARD**

In both education and skills development, technology has become an enabler and as countries, we need to equip youth with the 21<sup>st</sup> century skills so that they can adapt to the ever-changing nature of work.

Going forward, BRICS nations need to collectively develop platforms and avenues where these best practices can be shared, and the youth can access opportunities across borders. As mentioned above, using Artificial Intelligence, Augmented Reality and Virtual Reality, it is possible for BRICS nations to learn from each other and to share best practices on upskilling and reskilling. Leveraging the BRICS University network, countries can organise academic and cultural exchanges, where scholars and students can collaborate to develop knowledge products that can be used to train students on a variety of up and coming digital skills.

These can also help elevate the status of vocational education in the respective countries, making it aspirational for the youth to opt for vocational courses – helping them access meaningful jobs in the knowledge economy. ●

## REFERENCES

- Agastya Foundation. (n.d.). *Agastya International Foundation | Reimagining Education*. [online] Available at: <https://www.agastya.org/> [Accessed 28 Jul. 2023].
- Chakravorty, B., Bedi, A.S. (2019). Skills Training and Employment Outcomes in Rural Bihar. *Ind. Journal Labour Economics*, 62, 173–199.
- Censusindia.gov.in. (2020). *Home | Government of India*. [online] Available at: <https://censusindia.gov.in/census.website/>.
- Harvard University (n.d.). *Introduction to African Languages*. [online] Available at: <https://alp.fas.harvard.edu/introduction-african-languages#:~:text=With%20anywhere%20between%201000%20and>.
- India Today. (2023). *CBSE set to introduce AI and coding from Classes 6 to 8*. [online] Available at: <https://www.indiatoday.in/education-today/news/story/cbse-set-to-introduce-ai-and-coding-from-classes-6-to-8-2367509-2023-05-02> [Accessed 28 Jul. 2023].
- Indian Express. (2018). *More than 19,500 mother tongues spoken in India: Census, Indian Express*. [online] Available at: <https://indianexpress.com/article/india/more-than-19500-mother-tongues-spoken-in-india-census-5241056/> [Accessed on 15 Jul. 2023].
- McKinsey & Company. (2022). *What Is Industry 4.0 and the Fourth Industrial Revolution?* [online] McKinsey & Company. Available at: <https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-are-industry-4-0-the-fourth-industrial-revolution-and-4ir>.
- Ministry of Education. (1968). *National Policy on Education 1968, Ministry of Education, Government of India*. [online] Available at: [https://www.education.gov.in/sites/upload\\_files/mhrd/files/document-reports/NPE-1968.pdf](https://www.education.gov.in/sites/upload_files/mhrd/files/document-reports/NPE-1968.pdf)
- Ministry of Education. (1992). *National Policy on Education 1986: Programme on Action 1992, Ministry of Education, Government of India*. [online] Available at: [https://www.education.gov.in/sites/upload\\_files/mhrd/files/upload\\_document/npe.pdf](https://www.education.gov.in/sites/upload_files/mhrd/files/upload_document/npe.pdf)
- Ministry of Education. (2013). *NSQF Notification, Ministry of Finance, Government of India*. [online] Available at: [https://www.education.gov.in/sites/upload\\_files/mhrd/files/NSQF%20NOTIFICATION.pdf](https://www.education.gov.in/sites/upload_files/mhrd/files/NSQF%20NOTIFICATION.pdf)
- Ministry of Education. (2020). *National Education Policy 2020, Ministry of Education, Government of India*. [online] Available at: [https://www.education.gov.in/sites/upload\\_files/mhrd/files/NEP\\_Final\\_English\\_0.pdf](https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf)
- Ministry of External Affairs, India. (n.d.). *XIV BRICS Summit Beijing Declaration*. [online] Available at: <https://www.mea.gov.in/bilateral-documents.htm?dtl/35435/XIV+BRICS+Summit+Beijing+Declaration> [Accessed 28 Jul. 2023].
- Ministry of Foreign Affairs, PR of China. (n.d.). *VI BRICS Summit Fortaleza Declaration*. [online] Available at: [http://brics2022.mfa.gov.cn/eng/gyjzgj/jldrhwcgwj/202202/t20220222\\_10644323.html](http://brics2022.mfa.gov.cn/eng/gyjzgj/jldrhwcgwj/202202/t20220222_10644323.html).
- Ministry of Skill Development and Entrepreneurship. (2015). *National Policy for Skill Development and Entrepreneurship*. Available at: <https://www.msde.gov.in/sites/default/files/2019-09/National%20Policy%20on%20Skill%20Development%20and%20Entrepreneurship%20Final.pdf>.
- Pi Jam Foundation. (n.d.). *Pi Jam Foundation – Nurturing Creators of Tomorrow*. [online] Available at: <https://www.thepijam.org/> [Accessed 28 Jul. 2023].
- Pilz, M., & Regel, J. (2021). Vocational Education and Training in India: Prospects and Challenges from an Outside Perspective. *Margin: The Journal of Applied Economic Research*, 15(1), 101–121. <https://doi.org/10.1177/0973801020976606>
- Press Information Bureau. (2023). *Ministry of Ayush and Ministry of Rural Development signs MoU for skilling of rural youth and empowering women*. [online] Available at: <https://pib.gov.in/PressReleaseframePage.aspx?PRID=1907669> [Accessed 28 Jul. 2023].
- Reliance Foundation. (2023). *What we do/Education*. <https://reliancefoundation.org/education> [Accessed on 20 Jul. 2023]
- Singha, M. (2018). *Odisha govt launches skill on wheels to popularise vocational education*, Times of India. Available at: <https://timesofindia.indiatimes.com/education/news/odisha-govt-launches-skill-on-wheels-to-popularise-vocational-education/articleshow/65047719.cms> [Accessed on 15 Jul. 2023]
- Statista. (2014). *Total population of the BRIC countries 2014-2024 | Statista*. [online] Available at: <https://www.statista.com/statistics/254205/total-population-of-the-bric-countries/>.
- Wheebox (2023). *India Skills Report 2023*. Available at: [https://do3n1uzkew47z.cloudfront.net/siteassets/pdf/ISR\\_Report\\_2023.pdf](https://do3n1uzkew47z.cloudfront.net/siteassets/pdf/ISR_Report_2023.pdf).