Submission from IT for Change

- National Education Policy 2017

1   Background

As general purpose technologies that affect basic processes of knowledge and communication, digital technologies (Information and Communication Technologies or ICTs) have had far-reaching impact, making today's society an 'information society'. There is general agreement that ICTs can play an important role in strengthening and reforming the education system in India.

However, the design of ICT programs in education, their objectives and priorities will determine whether ICT can benefit or harm education. Based on its experiences from research, curriculum design and field projects over the last decade, IT for Change[1] would like to make a submission to the National Education Policy 2017 Committee, on ICT integration in school education.

2   Trajectory of ICT implementation in India

2.1 BOOT model

The first program to attempt universal ICT in school education was the 'ICT@Schools' program, which adopted the '*BOOT model"*. In this model, the vendor; typically an IT Company, implemented the program, providing hardware, software, content and faculty to the schools. The curriculum was largely limited to proprietary operating system and office suite, neither particularly relevant to students. The vendor faculty, usually with no qualification in education, worked with students directly, bypassing teachers. Not being engaged in the program, teachers did not adopt ICT in their work. Hence, ICT programs based on the *BOOT model* had little impact on mainstream learning processes and outcomes.

2.2 Integrated model

Kerala did not adopt *BOOT model*, here the ICT program was part of regular school processes, with curriculum focusing on ICT-integrated subject-teaching by the school teacher. The program used free and open source software (FOSS), invested in developing teacher capacities through self and peer-learning processes to integrate ICT for teacher professional development, digital resource creation and subject-teaching. Teacher groups took charge of maintenance of school ICT infrastructure, ensuring uptime. This model integrated the ICT program into the regular curricular and pedagogic processes of the school, and can be called the '*integrated model*[2]"

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1   www.ITforChange.net/education

2   IT for Change wrote a 'Policy brief' in 2009, comparing the *BOOT model* with the '*integrated model*", this is available on https://itforchange.net/Policy%20brief-ICTs

The '*integrated model"* was accepted as a successful model, in terms of teacher ownership and ICT integration across subjects in high schools, by a CABE sub-committee on ICT and education. The Committee's report[3] recommended that "agencies like CIET, NCERT play a leading role in formulating a generic ICT curriculum, developing the capacities of educational institutions and functionaries, and function as a nodal agency in expanding ICT use. Such activities should involve SCERTs / SIEs as well..".

MHRD and NCERT developed the *National Policy on ICT in School Education, 2012* and the *National ICT Curriculum, 2013* respectively, both supported principles and practices from the *integrated* model, articulating that ICT should provide collaborative spaces for teacher and student learning, and support creation of contextual learning resources.

After the failure of the *BOOT model*, many states governments have looked at a larger role for teachers in ICT and education, following the National ICT Policy and ICT Curriculum. State level repositories of Open Educational Resources have been set up in Karnataka and Telangana, which have adapted the *integrated* model.

However, since the *integrated model* requires a long gestation and significant investment of energy and resources, this model is not yet popular across the country. The pressure for 'quick solutions' is perhaps persuading education bureaucracies to continue with proprietary products and services of IT vendors.

2.3 The Big Data and Artificial Intelligence model

ICTs have changed over the last decade. While proprietary desktop software ruled the *BOOT models*; cloud based 'end-to-end" solutions[4], with gratis content, software and services, which is often bundled with proprietary hardware (such as Chrome books) is the emerging model. Here schools access content and processes on platforms owned by the vendor.

Teacher and student behaviour, captured and aggregated over different geographies and multiple instances on these platforms, will generate large amounts of data for predicting student learning and providing advice on teaching strategies, which the vendor will proprietise. This data monetised to generate profits will subsidise the education offerings and help the vendor create a monopolistic education market.

While proprietary software of the *BOOT model* created vendor lock-in; the *gratis, proprietary-platform based Big Data model'* has an even more direct influence on the core areas of *curriculum, pedagogy* and *assessment*, and hence poses a greater threat to educational processes and outcomes.

The data collected by the vendor will give it enormous power over individual teachers, schools and the school system; they will have little idea of this data, related metadata, or the algorithms analysing this data. As the data collected increases, its analyses through machine generated

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3 See CABE sub-committee on 'ICT and Education' report available on www.itforchange.net/sites/default/files/ITfC/Final%20Report%20of%20CABE%20Sub-Committee%20on%20ICT%20in%20SE%20.pdf

4 Such as Google 'G suite for education'

algorithms to make 'predictions' of what students and teachers require (and what they *should* do), will *seem more and more accurate and valuable*, creating greater dependencies of the school system on the proprietary platform and hence, on the business enterprise.

3   Designing ICT integration to address educational aims

All policy documents, from the 1966 Kothari Commission onwards, have reiterated that 'No people can rise above the level of its teachers'. Increasing teacher participation and agency, enhancing teacher quality and competence and strengthening teacher willingness can be seen as critical to achieving quality education.

Impact on teacher/ learner agency must be a key consideration for designing technology implementation programs. Two principles need to be considered in the design: **ownership** (public or private ownership) and **control** (centralised or decentralised). These two principles give rise to four possible design combinations - *public and centralised, private and centralised, public and decentralised, private and decentralised*[5].

The '*public and decentralised*' design has the maximum positive potential for strengthening the teacher's role; while corporates and education bureaucracies seeking 'quick results', could tend to prefer '*private and centralised*' models. The '*private and centralised*' design of the '*Big Data*' model has the highest negative impact potential on teacher and learner agency and capabilities.

Biases hidden in algorithms analysing Big Data are difficult to unearth in individual cases of discrimination. In fact, dangers of 'predictive profiling' are already well documented.[6] In the case of education, the bigger danger is that of teacher and learner agency. If the aim of education is to develop and strengthen learner agency, the learner must acquire abilities to go beyond her propensities and aptitudes, and through will and facilitation, seek newer, uncharted paths. Predictions based on '*personal learning analytics'* undermine possibilities for learner agency, creating a '*filter bubble'* in terms of student aspirations and perceived capabilities for learning.

The *private and centralised* design will move teachers and students to largely being 'consumers' of ICT rather than aware and participatory 'citizens', who can understand ICT, have a voice in program design and implementation. Such de-politicising of the design of ICT programs in education will adversely impact possibilities for an inclusive, democratic learning environment and cause a failure to achieve educational aims.

4   Submission

The role of ICT in education must be informed by accepted educational principles (learner autonomy and active participation in learning, decentralised education structures and processes, teacher agency and autonomy) and priorities, not primarily by technological advances.

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5   A paper presented by IT for Change at a *national conference* in 2015, examined empirical evidence from ICT programs in Indian school education, to develop this grid, see https://itforchange.net/it-for-change-at-comparative-education-society-of-india-cesi-conference-2015

6   https://linnettaylor.files.wordpress.com/2017/01/groupprivacy.pdf

One important learning from the *BOOT* and *integrated* models is that the role of business in school education needs to be carefully considered. While the supply of specific goods and services to schools, can be, and is, done by businesses, the *core* areas of *curriculum, pedagogy* and *assessment* must be firmly kept within the mandate of public institutions, out of the reach of products and services from businesses.

Based on this understanding, we would like to make following specific submissions to the NEP Committee:

1. The Policy must persuade education systems to move towards the '*public and decentralised*" spectrum in ICT architecture and implementation, privileging participation in creation, sharing and use, over passive consumption of ICT. ICT infrastructure must be owned and managed by the school. Digital educational processes must be owned and managed by the teachers. Business role must be limited to basic infrastructure maintenance and support and not enter core educational processes of curriculum/content, pedagogy and assessment.

2. Use of Free and Open technologies, including Open Educational Resources and FOSS is critical to ensuring public ownership and control over vital ICT resources. Private / proprietary control over ICT resources used in education is inimical to educational aims and should be prohibited.

3. Teachers and schools should have autonomy in the choice of technology implementation - hardware, software and content, in a manner appropriate to their contexts, to further educational aims.

4. Choice of educational content and platforms used in school programs must be subjected to evaluation by the public institutions entrusted with the task of developing curriculum.

5. Safeguards must be put on collection and utilisation of student data, including academic performance as well as technology habits, such that these are used without any prejudice to learner agency[7]. Clear norms need to be established to ensure the public nature of school data and its use, to avoid its proprietisation and promote public interest.

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7   The issue of data ownership and use is to be studied by the Srikrishna Committee on data protection.