Flying the KITE High against Digital Colonialism: FOSS in the Era of EdTech

While the FOSS campaign has been instructive for the global digital justice movement, can it eradicate digital colonialism?

By [Michael Kwet](#)

Summary ▾

Education technology, or EdTech, is increasingly shaping and influencing the day-to-day experiences of students, teachers, and administrators. Recognizing the importance of education to the digital economy, corporations are capturing emerging markets in schools and higher education institutions through the process of [digital colonialism](#).

In the past two decades, US-based transnational corporations have become firmly entrenched within the two core segments of EdTech – education-specific technology (such as Microsoft Education and Google for Education) and general-purpose technology (such as Microsoft Windows and Google Android). In India, Microsoft and Google have come to dominate the market for operating systems and office productivity software, and their suite of products for 'digital classrooms' are also [popular](#).

In 2001, the Kerala government launched an EdTech project, IT@School, that was successfully pressured to resist digital colonialism. Recognizing how Microsoft, the tech super-giant of the day, threatened to undermine digital self-determination, activists and teacher's unions pushed the Kerala government to make Free and Open Source Software (FOSS) mandatory in public schools. While IT@School and its successor, KITE, are scarcely known outside of India, their success over the past two decades presents an important model for resistance to Big Tech.

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The KITE project initially catered to the era of personal computing. Now that computing has gravitated towards online spaces, KITE faces challenges from today's Big Tech giants who are trying to force their way into the Kerala education system. Confronted with a new era of cloud computing, surveillance-driven services, and online platforms, Kerala will need to take proactive measures – including the development of FOSS-based online infrastructure and services capable of handling large populations, education campaigns, grassroots pressure, and strong socialist policies – to maintain a semblance of self-determination in its public schools and the broader digital economy.

The Origins of IT@School

Corporate colonization of India's EdTech space dates back several decades. In 1990, Microsoft, the tech super-giant of the personal computing era, set up operations in India. By 1997, Bill Gates announced the penetration of Microsoft software "in four education segments: university-level computer science education, training for IT professionals, computer education in schools, and career-oriented education".

Foreign corporations like Microsoft stood to profit by capturing emerging markets for core infrastructure like operating systems and office productivity applications. Recognizing the threat of proprietary software to digital self-determination, in 2003, India's then President, A.P.J. Abdul Kalam, famously rebuked Bill Gates's position, stating that "open source code software will have to come and stay in a big way for the benefit of our billion people".

In 2001, the Department of General Education, Government of Kerala, formed the IT@School initiative to integrate information technology (IT) into Kerala's education system. While the project initially used proprietary software – with Microsoft as the central provider – Free Software activists quickly pushed back, arguing that FOSS would save the schools money, prevent vendor lock-in, and empower Indians to own and control their own digital destiny.

With FOSS, users and communities can use, study, develop, and share their software, allowing them to shape and customize their own experiences. Although FOSS licenses allow people to sell the software, anyone is free to share copies, and thus end users can exchange the software for free. Free Software is therefore almost always free (as in price), which makes it more accessible to the poor.

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These insights motivated pushback against the use of proprietary software in Kerala schools. After a visit from Richard Stallman in 2001 at the invitation of FOSS advocates, the Free Software Foundation India (FSFI) was founded with state support. That same year, the Department of Information Technology (DIT), Government of Kerala, published its IT Policy Document advocating for the "judicious use of open source/free software that complements/supplements proprietary software" as well as research into the use of FOSS.

The State Council of Education and Training then planned to require proprietary software for the state's IT syllabus. Starting in 2000, Intel Asia Electronics began training teachers across India to use Microsoft software, an extension of their 'Wintel' partnership. However, Microsoft would soon make a grave mistake. When it discovered piracy was rampant in Kerala schools, Microsoft joined forces with Kerala police and raided schools for pirated copies – despite requests not to carry out the raids by IT@School members (Kerala had a per capita GDP of about USD 566 at the time). This resulted in a backlash against the company. The FSFI spearheaded an opposition campaign against proprietary software in education. A teacher trade union, Kerala State Teacher's Association (KSTA), joined with FSFI to oppose proprietary software in schools. Together, activists forced the Kerala government to include Linux and Open Office as optional subjects in the state's 2003 education

curriculum.

After the FOSS campaigns took flight, there was no turning back. Several organizations and government institutions began promoting and developing FOSS. The Indian Institute of Technology (IIT) focused on teacher training and education content, and other education institutions and research organizations were slated to join the initiative.

As institutions were built, a rich variety of projects and plans were formed and implemented. In 2005, the Kerala government announced a complete FOSS migration, to be completed in phases. An education satellite (Edusat) was launched, broadband rollouts to schools began, and the IT syllabus in schools was changed exclusively to FOSS. In 2006, a customized FOSS-based operating system, IT@School GNU/Linux, was released and included a set of applications for education. In 2007, the state government published a policy document, 'Information Technology Policy: Towards an inclusive knowledge society'. Using FOSS to create "a truly egalitarian knowledge society", the policy stated that the "Government will take all efforts to develop Free Software and Free Knowledge and mandate the appropriate use of Free Software in all ICT initiatives."

In 2009, the International Centre for FOSS (ICFOSS) was formed to promote FOSS usage. A 'SchoolWiki' was created for students and teachers to input information about their schools, while custom FOSS software like Dr. Geo (for geometry), K-Tech Lab (for physics education), and Kalzium (for chemistry) were deployed.

Throughout this time period, IT@School received several awards for its performance, including Honorable Mention in Education at the prestigious Stockholm Challenge Awards. By 2011, it comprised the largest public sector GNU/Linux deployment in the world, with about 500,000 students using it. Between 2007 and 2012, ICT infrastructure was provided to 4,071 schools, and as many as 150,000 teachers were equipped with ICT skills. Eventually IT@School would extend to lower grade levels and begin to move upwards towards the university level.

IT@School Becomes KITE

In 2017, IT@School was promoted to a 'government company' and renamed Kerala Infrastructure and Technology for Education (KITE), which enabled it to secure funding from the Kerala Infrastructure and Investment Fund Board (KIIFB). The KITE project would also extend its ICT support to the higher education sector. By February 2020, Kerala became the first state in the country to go completely digital in education.

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The KITE program houses a wide variety of projects. These include customized operating systems like KITE GNU-Linux – which comes pre-loaded with education apps, office software, language input tools, audio and video editing apps, scratch visual programming, image editors, and the like – and BOSS Linux, which sports five editions, including EduBOSS, a custom OS pre-loaded with software catered to education.

KITE also built several projects to deliver and provide resources for the production of open educational resources (OERs) to students, teachers, and the general public. The KITE Open Online Learning (KOOL) platform offers India's first home-grown massively open online courses (MOOCs), mostly on how to use computer programs. Other OER projects include the Samagra eResource Portal learner management system and the E3 English Language Lab. One innovative project, Little KITEs – a collection of clubs set up at schools (featuring over 100,000 student members, the largest student IT network in the country) – provides training to students in computers, programming, electronics, hardware, cyber safety, animation, robotics, and more. In over 2,000 schools, students' mothers have been trained by Little KITE members, and the program has been so successful that Finland is adopting the model for its own schools, with assistance from KITE.

Furthermore, several institutions provide support, training, research, and development in conjunction with the KITE project. These include the Akshaya centers (to provide ICT training and access to computers) and the State Institute of Educational Technology (SIET) (to produce content and train teachers), among others.

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Of course, placing digital tech into schools makes little sense without access to devices, internet, and data. KITE has helped schools bridge the digital divide by equipping tens of thousands of classrooms with hardware. Close to 5,000 schools will soon be upgraded to 100 Mbps fiber broadband internet, with free high-speed internet connectivity to over 2 million financially disadvantaged people.

KITE is also attempting to make classrooms digitally inclusive. Its operating system includes a wide variety of Indian languages, while its laptops incorporate screen-reading software called ORCA, and all visually-challenged teachers have been given specialized ICT training. Other programs include open access audio books and sign language-adapted classes, as well as a special portal within the Samagra Shiksha Kerala (i.e., Inclusive Education Kerala) platform for tribal students. Through its Digital Media Literacy program, KITE is also training 200,000 students in grades 5-10 to recognize fake news.

The Internet Era: Problems and Challenges

Despite its commendable and impressive set of projects, times have changed, and the KITE project faces a very different digital landscape today than when it started.

As devices and the internet spread across the world, online services consolidated into centralized platforms ruled by primarily US-based corporations. Big Data, interpreted by artificial intelligence (AI), was pooled into cloud-based server farms, and has become a new source of wealth and power. FOSS was selectively integrated into corporate offerings, and a mixed economy of proprietary software and FOSS took hold. Recognizing the value of FOSS, corporations discovered a loophole in FOSS licenses: FOSS could be run on a server operated by, say, Google or Facebook, and they could make private modifications to it without having to disclose those modifications to the public. In response to corporate enclosure, the FOSS community tried to adapt through new licenses such as the Affero General Public License (AGPL), which stipulated that the source code must be disclosed to the public if you run the software on a server. However, the AGPL has had limited uptake.

In recent years, it has become apparent that FOSS alone is a weak weapon against state-corporate power. Digital justice advocates need a broader focus and set of strategies to make freedom and equity a lived reality. In the meantime, to a degree, the KITE project has struggled to keep with the times. Issues surrounding privacy, policy, foreign colonization, corporate power, state repression, environmental sustainability, and ideology present major challenges to the future of KITE and its choices and actions as an initiative have created new frictions.

The challenges of cloud colonialism

In the recent past, the KITE project has deployed proprietary and Big Tech services that do not comport with user and community freedom. This was largely prompted by the rapid shift to mass deployment of online services during the Covid-19 pandemic, where KITE was not prepared to use FOSS-based services in some domains.

For instance, in 2021, KITE began rolling out Google's G-Suite for Education platform, provided free of cost by Google (G-Suite has since been renamed to Google Workspace). While Google has stated it does not include ads, and that personal details about students or teachers are collected in the platform, and that KITE "will have master control of the data in the platform", the fine details around which data is collected and who gets access have not been disclosed to the public. The Free Software Community of India (FSCI) pushed back against Google's assurances – and the choice to use Workspace itself – noting that Google can use its vast trove of data collected elsewhere and deanonymize Workspace users easily.

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Moreover, not only is Google Workspace for Education proprietary, it begins to direct students and teachers towards Google services more generally (e.g. by having them install the classroom app from the Google Play Store), and Google may one day charge the government for its services after colonizing the local market. It is also a likely opportunity to push Google Chromebooks into the Indian education system. Despite protests from FOSS activists, the rollout briefly continued and Google offered accounts to 4.7 million students and 170,000 teachers. This violated the Kerala government's policy mandating FOSS in schools and undermined KITE's long-standing commitments to software freedom, human rights, and socioeconomic justice.

In response to questions about the Google rollout, KITE's CEO, Anvar Kadath, said KITE is no longer using the Google Cloud, Workspace platform, or online services like Google Meet, Docs, and Gmail. "It was a temporary phenomenon" that ended in 2021, he stated. The temporary choice to use Google services was connected to the cost of infrastructure, Kadath explained, adding, "you didn't have an option [in place] to cater to 22 million students and 100,000 teachers [at the time of the pandemic]." FOSS activist Praveen Arimbrathodiyil notes that a FOSS-based video conferencing system like Jitsi Meet or BigBlueButton "would be a massive cost" when scaled up to millions of school participants. "But if Google provides it free of cost," he said, it is difficult to resist.

FSCI member, Ravi Dwivedi, also emphasized the high costs of hosting some online services. Moreover, he said "a lot of people are not convinced of [FOSS alternatives]". Arimbrathodiyil added that for India in general, cloud-based services like Google are "not an easy thing to replace. [The alternatives] will only come if people realize what we are compromising."

Furthermore, Kadath said that KITE also temporarily used Amazon Web Services when data volume was high (2018-2019), but is now exclusively using the India State Data Centre. Using centralized clouds raises questions about which data local authorities may be able to access about school participants. In the long run, decentralized storage options powered by FOSS might be able to provide a higher degree of privacy.

Other problems and challenges

Other projects, even if they are based on FOSS, present major challenges to the KITE project. In recent years, there has been a shift towards private schooling, which exacerbates the stratified nature of India's education landscape and bypasses public sector mandates to use FOSS in schools. Tech services like BYJU's – a private tutoring platform – have expanded throughout the country, and are highly sought after by parents and students. BYJU's stands accused of predatory practices that drive parents into debt, and as one of India's premier tech giants, it concentrates wealth into the hands of rich executives and shareholders at the expense of the society.

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In addition to privatization, there are privacy questions that need to be resolved. For example, the FOSS-based Sampoorna school management platform allows principals, head masters, and teachers to capture details of all students, teachers, and non-teaching staff from classes 1 to 12 (in addition to details about school infrastructure). Sampoorna includes fields for 'religion' and 'caste', and while students are not obliged to fill them in, the press has reported that some school authorities upload the details themselves.

The Sametham Kerala School Data Bank is another FOSS-based platform that aggregates data about schools, including "details of students in each class, teachers, and non-teaching staff (without personal details), etc.,

which can be used for various report generations at school, educational sub-district, educational district, revenue district, and at the state level". While the data collected by Sampoorna and Sametham does not include moment-to-moment activity of school participants, they may provide a backbone for fine-grained data collection in the future.

Another Big Data-based technology, 'adaptive learning', is also being developed for use in the classroom. Adaptive learning ingests moment-to-moment student activity using the platform to assess their competency levels and guide each individual's curriculum, in part through mass surveillance of student cohorts. C-DAC is developing 'Adaptive Learning Technology' for personalized education, though doesn't say which data will be collected, how it will be stored, and how privacy would be – or if it *could* be – protected.

C-DAC also works on a wide range of biometrics, including "fingerprint, iris, vascular, periocular, handwritten signature, voice, and face recognition". Biometrics were invented and used by European Social Darwinists and deployed in India, South Africa, and other places to surveil and control indigenous persons. Fingerprint classification, iris matcher, and facial recognition apps are used by law enforcement agencies, and these different forms of biometrics can be used together for 'multi-modal identification'. The 'Biometric Attendance System' uses both a touchscreen and a 'centralized, web-based' system, and is intended for use by offices, colleges, and schools on Windows or Linux.

In October 2022, *The Hindu* reported that Kerala Police plan to expand their CCTV surveillance network to major centers, based on a plug-in surveillance model where some cameras were supplied by private groups. In Kerala schools, authorities once ordered a ban on the use of CCTV cameras in classrooms, based in part on the notion that being constantly surveilled is bad for students' mental health, but it was stayed by the Kerala High Court. In 2020, teachers in Thiruvananthapuram claimed that a school principal installed CCTV cameras "to track if they sit even for a minute". Without laws in place to protect the privacy of students, teachers, and staff, schools and classrooms could become 'smart' sites of mass surveillance.

Solutions

Since its inception, the Free Software philosophy has guided the thinking behind KITE. Two decades in, it may be the most impressive project to resist the harms of digital colonialism and secure digital freedom to date. However, as noted earlier, the digital ecosystem has changed considerably in recent years, and new challenges can erode or erase its gains in a short time.

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To counter the recent turn towards online infrastructure owned and controlled by US tech giants, FOSS activist groups like the FSCI and FSFI have demanded an excellent set of alternatives. These include FOSS chat apps based on the Matrix and XMPP protocols, use of Moodle LMS and BigBlueButton virtual classroom software, as well as a variety of FOSS apps for use in education. They have also called for new laws to protect people's privacy.

While these solutions are welcome in the short term, they only cover a small portion of the digital economy. Through education, people can be encouraged not to use proprietary and surveillance-based software and services, but digital capitalism, by its very nature, concentrates wealth and power, and it is difficult to fend off without changes to how the digital society operates.

Western 'solutions' to Big Tech include passing weak privacy laws (which have not rolled back state and commercial surveillance), unionization of tech workers (including middle- and upper-class engineers servicing modern-day East India companies), public option subsidization (i.e., mixed economy capitalism), and antitrust (to make digital capitalism 'fair' and 'competitive').

As we will see in my next two articles for IT for Change, this tech 'left' systematically ignores the fact of US hegemony in the global digital economy and the systemic flaws of capitalism – including its progressive form as terminal illness. The most important element that should be on everyone's mind – avoiding irreversible ecological catastrophe – is hardly mentioned, let alone addressed, in the US-centered tech 'left'.

Degrowth scholars demonstrate that aggregate economic growth is destroying the planet, leaving us with a very different solution to the crisis than the mainstream tech left promotes. If total material resource use by all humans needs to be reduced and capped, then a just transition requires class abolition within and between countries, because resources are too limited to supply all 8 billion people a Western-sized economy. And the time to make that transformation a reality is running out fast.

The Free Software Movement has traditionally favored building new things – weakly protected by FOSS licenses – as a means to secure liberty and socioeconomic justice. Most of the leading intellectuals, much less the rank and file, haven't delved deeply into the global political economy. (And today, where they are, they're peddling the agenda of the Western imperialist 'left'.) Yet within capitalist and state authoritarian systems, there are fundamental limitations to making a free and equal society a lived reality. At the end of the day, there's a reason US transnationals are still threatening the schools, and that's not even to speak of their dominance of the broader digital economy (including the means of production, computation, and knowledge). FOSS is essential to digital justice, but by itself, it cannot produce the conditions of freedom and equality for people to flourish. Without broader political, economic, and social transformation, the status quo will remain intact.

The KITE project has been successful in ways that are exciting and instructive for the global digital justice movement. It deserves widespread recognition and celebration. However, to save the environment, break the power of Big Tech, and eradicate digital capitalism and colonialism, there needs to be an eco-socialist Digital Tech Deal designed for broad system change. Only bottom-up, organized plans for an egalitarian transition that fix root causes – digital capitalism and colonialism – can produce a truly free and equal future in harmony with nature. If there is to be 'free software, free society', or a society *at all*, the digital justice movement needs to push for deep system change. India has been at the forefront of digital activism, and is as good a place as any to start.

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#Big Tech   #Big Tech and Society   #EdTech   #education   #FOSS

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