The Imperative for Connected Schools in Indonesia

Policy Brief

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Ibu Delhi and her students in active learning with ICT session in Medan, North Sumatera. Photo by Popo Alexander.

Summary

Research conducted by the World Bank has demonstrated that the Internet can connect the Ministry of Education and Culture (MoEC) and schools throughout the archipelago. Up to 95 percent of schools are currently within affordable reach of at least low-speed Internet connectivity, enabling email, messaging, and downloads of limited size. Use of ICT can lead to improved information management at the national, district, and institutional levels, which will also benefit educators and students. Increased communication and information sharing can help improve low-performing schools, while digital curriculum resources and distance education can help low-capacity educators. All of the ingredients are in place to make this happen in Indonesia.

Given that this is technically and financially feasible and that it is defined as a policy commitment by the MoEC, it is recommended that decision-makers:

1. Enter into Framework Agreements with Telecommunications Operators/ Providers to enable schools to purchase annual Internet subscriptions using BOS funding, and assuring Internet safety.
2. Focus Jardiknas/SchoolNet connectivity rollout on those schools that cannot afford connectivity with their current BOS funding allocations.
3. Work systematically through the e-services requirements to manage school data submission, particularly for the BOS, and DAK funding requests through online facilities.
4. Support aggregation of all current educational content into a single *Rumah Belajar*, as is currently being implemented by Pustekkom.
5. Commence a sustained advocacy drive to encourage schools to get connected in order to enable access to the BOS/DAK facilities and to the *Rumah Belajar*.

> Use of ICT is believed to support efforts to increase and equalize access to education, improved quality, relevance, and education competitiveness, along with management, accountability, and public image of education. Application of ICT for education by MoNEcan expand the affordability of education and strengthen governance at the same time.
>
> *2010 - 2014 MoNE Strategic Plan (Renstra)*

The Imperative for Connected Schools in Indonesia

Why Should We Connect Schools to the Internet?

The 2014 MoEC Vision is to deliver excellent national education services in order to create comprehensively bright Indonesian individuals.

Excellent national education services are defined as being:

- **Available** equally across the entire country;
- **Affordable** by all levels of society;
- **Quality and relevant** with the needs of society, business and industrial sectors;
- **Equal** to fellow Indonesian citizens in obtaining quality education taking into account socio-cultural, economic, gender, and geographical diversity; and
- **Assurance that** Indonesian citizens will receive education in line with the demands of society, business and industry.

Strategic and system-wide use of ICT in Indonesian education is integral to achieving the Ministry of Education and Culture (MoEC) vision because it supports all of these objectives. ICT facilitates more affordable and equitable access to teaching and learning resources and provides opportunities to improve work and life skills. Effective deployment of ICT has the potential to address key barriers that impede the improvement of education in Indonesia:

1. **The Internet can connect the MoEC and schools throughout the archipelago.** Up to 95 percent of schools are currently within reach of at least low-speed Internet connectivity, enabling email, messaging, and downloads of limited size.
2. **Use of ICT can lead to improved information management** at the national, district, and institutional levels, which will also benefit educators and students. This would include:

a. Increased reliability, validity and comprehensiveness of reporting by educational institutions, ensuring submission of Bantuan Operasional Sekolah (BOS) data and thereby accelerating disbursements;

b. Institutional improvement through the use of information to assess strengths and weaknesses;

c. Transparency in the significant investments taking place to refurbish schools through the Government's Special Allocation Funds (DAK: Dana Alokasi Khusus) by creating online refurbishment request tracking facilities connecting schools, districts, provinces, and MoEC; and

d. Evidence-based policy-making, planning and financial management.

3. **Increased communication and information sharing can help improve low-performing schools.** Widespread 'ICT infrastructure' will help to strengthen MoEC management, while supporting school management and monitoring to increase educational institutions' accountability.

4. **Digital curriculum resources and distance education can help low-capacity educators.** Increasing participation in professional development can be accomplished cost effectively via ICT, and can be combined with access to high-quality learning resources (currently being aggregated through the *Rumah Belajar*), to improve practices in rural and low-performing schools.

Thus, investing in ICT in Indonesian education can help to address challenges of high inequality, low school capacity, lack of capacity of educators, lack of access to curriculum materials and learning resources, as well as low levels of reporting of even basic school management and financial information, ultimately preparing the ground for e-administration.

Other developing countries – such as Brazil and Vietnam – are already making rapid progress in connecting all of their schools to the Internet and deriving the benefits that come from being able to communicate immediately with all schools, sharing educational resources with them and receiving data on their performance. All of the ingredients are in place to make this happen in Indonesia.

Using ICT to support BOS and DAK funding distribution

A key benefit of a sustained drive to connect all schools to the Internet would be the support this would provide to distribution of BOS and DAK funding. Specifically:

- *For BOS funding, Internet connections would enable all schools to submit data required for BOS funding distribution directly to a central data warehouse. This would accelerate funding distribution, while also ensuring that schools submit needed data that can be used to support decision-making and ensure accountability in their performance.*
- *Requests for DAK funding could be handled via an online Refurbishment Request Facility. This would enable allocation of funds to be linked directly to specific needs that schools have, based on the Minimum Standards defined in the MSS. IT would also enable schools, districts, provinces, and MoEC to track progress in DAKimplementation more systematically, thus enhancing transparency and speeding up distribution of funds.*

What Will It Take to Connect all Schools in Indonesia to the Internet?

Up to 95% of all schools in Indonesia can already be connected to the Internet using today's telecommunications infrastructure. Of these, 78,000 schools can get fixed broadband connections, which would allow them full access to digital e-content and online services offered by the MoEC. Another 169,000 schools can be connected via mobile Internet. While not all of those schools would benefit immediately from broadband Internet connections, the rapid rollout of fibre-optic upgrades around the country means that the number of schools connected via broadband rather than slower connections can increase very rapidly over the next couple of years.

This leaves fewer than 5% of schools that could not get Internet access today, other than through very expensive satellite connections. However, with the rollout of large telecommunication projects such as the Palapa Ring undersea cables and the ongoing roll-out of mobile networks in rural areas, the number of schools that cannot be connected to the Internet is set to reduce quite rapidly.

At the same time, developments in solar technology and low-power devices mean that it is possible to get ICT into remote rural environments, even where there is not yet electricity supplied by PLN. New ICT devices use very much less electricity than their counterparts from even a few years ago. For example, 50 Netbooks (a small mobile device with a lot of the functionality of low-end laptops) use the same amount of power as just one standard PC from 2008. Solar power solutions that cost in the region of $1,000 to $1,800 can power all of these devices.

The Telecommunications Realities

The statement that 95% of schools are already within immediate range of Internet access is often greeted with disbelief. However, the first operator, Telkomsel, reached the 95% population coverage threshold by end of 2007. A total of 20,000 towers is reportedly what a typical Indonesian mobile network requires to reach that coverage threshold. The current number of base stations of Telkomsel has subsequently grown to over 36,000.

In its annual report of January 2010, Telkom confirms population coverage in excess of 95% of the total. It also refers to the Universal Services Obligation (USO) project, in which Telkomsel provides coverage and basic supervised mobile payphones in every village in Western Indonesia (Java, Sumatra, Kalimantan, Bali, NTB, and NTT). Thus, every village has a mobile signal, at least with a fixed antenna on a pole. Telkomsel provided this to all of the remaining 25,000 villages on these islands which, according to Postel, had no telephone service previously.

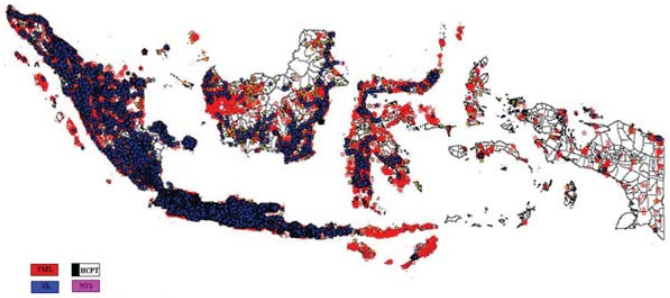
Of course, there are still difficulties in rolling out connectivity in some areas of Indonesia, particularly in Papua. However, in those areas,

Telkomsel covers most of the population (there are 1.5 million mobile users out of 2.8 million inhabitants in the Papua provinces). Maluku, Papua and a few other small islands are the main areas which lack some coverage, but their total accounts for far fewer than 5% of the population and of the number of schools in Indonesia).

Thus, Java, Sumatra, Bali, NTB, NTT, most of Sulawesi, and the populated parts of Kalimantan are all covered and the blank spot areas are mostly in Maluku and Papua, while even there most of the population lives in areas that are covered. Since the end of 2009, several more towers have been built.

A recent Kominfo presentation presents a map of all mobile towers deployed by the end of 2009:

Figure 2. Wireless Access Infrastructure Distribution, 2009



Blank spots are represented by white areas mostly located in the Eastern Indonesia Region.

Source: Ministry of Communication and Information, 2010

The financial implications

Based on the above assumptions, it is possible to give a rough indication of the hardware and connectivity cost for the first 95% of schools to get a basic ICT hardware package and annual Internet subscription. To project the cost, it is necessary to make a few assumptions, which are as follows:

1. Approximately 30% of schools will already have functional ICT equipment (which we estimate according to data from Pustekkom and from the World Bank Independent Monitoring Survey).
2. Approximately 20% of schools will require a solar power solution.
3. Schools will require the following initial package to derive the benefits outlined in this document:
   a. A modem and installation;
   b. Two netbooks, one for administrative use and one for teacher Internet access;
   c. A printer;
   d. USB Flash drives for all teachers to enable them to store content.

Based on this, an estimated cost in 2012 for rolling out ICT infrastructure and Internet connections to the first 95% of schools would be as follows:

Total Cost To Procure Basic Packages	Rp. 1.2 trillion	US$ 146 million
Add Solar Power Solutions for 20% of schools (@ Rp. 8,900,000 per school)	Rp. 377 billion	US$42 million
Total Annual Connectivity Cost (2012)	Rp. 701 billion	US$79 million
Total	**Rp. 2.4 trillion**	**US$267 million**

Through the BOS funding made available to schools, it is already allowed for schools to purchase computers and annual Internet subscriptions. To pay for Internet subscriptions for the 95% of schools that are already within range of existing telecommunications services would only require 3.2% of the total BOS budget for 2012 – a small fraction of the overall expenditure through BOS. This would be reasonably easy to absorb into this existing fund, provided a plan is made for those schools of under 100 students whose BOS allocations would not easily absorb this cost.

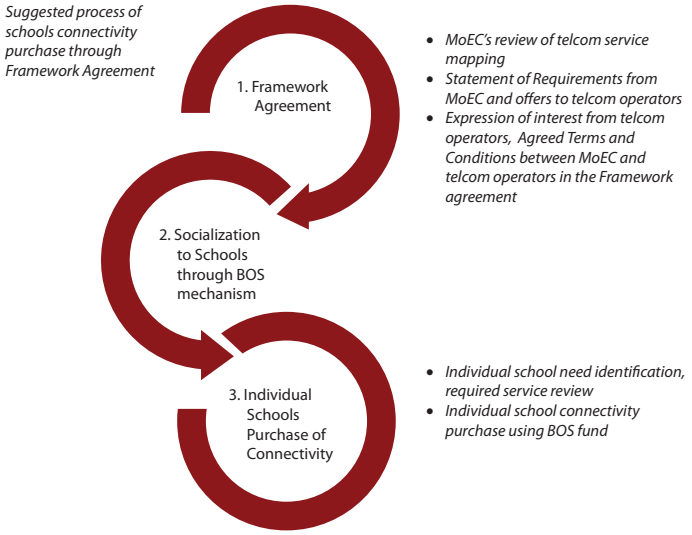
Framework agreements as a procurement tool

Framework agreements are preliminary agreements entered into, ideally over longer, multi-year periods, between a central institution and service providers that serve as an 'umbrella' document for an individual school contract with one or more selected companies. Framework Agreements would provide a good contracting vehicle between the Ministry of Education and Culture (MoEC) and Telecommunications Operators/Providers to facilitate procurement of connectivity at reasonable prices. They would provide a means to outline the key points of the required service provision, establish quality standards with the value for money for bulk purchasing, and a tool to initiate a 'mini competition' among these Operators to provide better and wider scope of services for schools across Indonesian provinces.

Both the MoEC and individual schools will benefit from such an agreement. The MoEC will be able to leverage the number schools' access to connectivity in a more speedy way, in addition to the existing Jardiknas/SchoolNet central procurement. A Framework Agreement reduces the transaction cost and time to purchase connectivity through a centralized contract. Schools can work within the negotiated terms and conditions agreed in the beginning of the process to use BOS funds to buy quality connectivity and gain direct access to better after-sales service. This would enable School Net/ Jardiknas to be targeted specifically to under-resourced schools with fewer than 100 students as mentioned in the above section, with other schools procuring connectivity through a Framework Agreement.

Below is one suggested outline of how a Framework Agreement could be harnessed for this purpose:

Figure 2. Possible Framework Agreement Implementation Process



Teachers prepared fun powerpoint assessment game. Sidoarjo, East Java. Photo by Petra W. Bodrogini.

Recommendations

Based on the above, the following recommendations are offered for consideration:

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2. Focus Jardiknas/SchoolNet connectivity rollout on those schools that cannot afford connectivity with their current BOS funding allocations.
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