English for the underserved: Closing the digital divide

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Published in Training, Language and Culture Vol 2 Issue 4 (2018) pp. 9-25 doi: 10.29366/2018tlc.2.4.1

Recommended citation format: Carrier, M. (2018). English for the underserved: Closing the digital divide.

Training, Language and Culture, 2(4), 9-25. doi: 10.29366/2018tlc.2.4.1

This paper explores the problems faced by schools in developing economies worldwide in accessing interactive communications technologies (ICTs) due to lack of electricity, lack of equipment and lack of training both for teachers and for students. Although the middle class in developing economies is growing fast, something like 4 billion members of the global population have no access to digital technology, giving rise to the term, 'digital divide'. Governments, international agencies and charities are all investing personnel and resources to overcome these problems and provide opportunities for language learning and other skills. The paper argues that the introduction of edtech facilities in local schools in emerging economies will help solve problems of overcrowded classrooms and teach learners essential skills that they will need in their careers. It provides case studies from different countries and examines types of educational technology resources and teacher training approaches used to help learners access and master digital literacy.

KEYWORDS: *edtech, educational technology, digital divide, ICTs, developing economies, digital immigrants, digital literacy*

1. INTRODUCTION

This paper outlines the nature of the digital divide in developing economies and how we can use new and alternative technologies to narrow this divide, thus providing broader opportunities for learning and access to global knowledge, even in low-resource contexts.

Butare is a sizeable town in the south of Rwanda, about 4 hours from the capital Kigali. The school we were visiting was a collection of low red brick buildings around a fairly muddy and uneven schoolyard. The classrooms were cramped, given there were 50 children in each classroom, and the chalkboard was so scratched that it was hard to read the English vocabulary the teacher had written up there.

We brought a gift of dictionaries, as we had been informed that the school had none available. The few textbooks that they did have were kept locked in the head teacher's office. There was no technology – no TV, radio or computer – and there was only intermittent electric power. But the learners were energetic, sharp and eager to learn.

Ever since I first visited Rwanda when I was at the British Council, and saw the difficult conditions

doi: 10.29366/2018tlc.2.4.1
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that teachers faced in the rural and small-town schools, I have felt that we in the edtech community could really do a lot more to help students and teachers in developing economies. This led me to look into the world of 'alternative' edtech, by which I mean simply innovative edtech that is outside the mainstream of what schools and teachers normally use.

2. WHO ARE THE UNDERSERVED AND WHAT DO THEY NEED?

The problem of digital learning, and the use of educational technology, is that no matter how wonderful the affordances of these technologies are, and how much they complement teaching and support learning, they are all somewhat useless if students cannot gain access to the technologies because they lack the economic resources or the infrastructure access.

This is the so-called 'digital divide'. The key premise is that *'the global spread of ICT has increased inequality, and that the poorest and most marginalised have therefore failed sufficiently to benefit'* (Unwin, 2017). Essentially, it means that the poorest learners in the world do not have access to the same technologies that are available to students in richer economies, and thus lack the same access to knowledge and learning opportunities. This is something that educators need to address, to reduce inequality and improve equity of learning access.

The digital divide is shrinking in some areas, as more and more people in the global population are able to access mobile phones, and even Internet-connected smartphones. Mobile phone users were estimated at 4.7 billion in 2017, while Internet users in 2017 had grown to about 3.8 billion (eMarketer, 2017), thus providing around half of the world's population with Internet (and thereby learning) access.

But this leaves around 3-4 billion people with no Internet connection, and a similar number without reliable access to electricity, without the actual devices to connect to the Internet, without affordable mobile phone service, and without the economic opportunity to buy data subscriptions.

This half of the global population represents *the underserved*, those on very low incomes and without technology provision who therefore have less access to learning in general and English language education in particular.

Their situation is improving to some degree as earnings at the base of the economic pyramid are rising, and there is rapid growth in those defined as 'middle-class', earning between $10-$50 per day. There has been a huge increase in the middle class in Brazil, the middle-class in Africa is projected to double to 2 billion by 2030, the middle-class in Asia is projected to double by 2030 to 3.5 billion, and the middle-class market in India will be bigger

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than either the US or China by 2030 (Kharas, 2017). This increase in income will eventually lead to families being able to buy books, pay school attendance fees, buy data plans for mobile phones, and thus increase access to learning resources. In the meantime, and for some time to come, alternative technology is one of the answers to lack of access.

3. HOW CAN WE HELP?

How can we help these people in the meantime to access global knowledge and global learning opportunities, given the constraints that they face? Their needs are the same as ours, they need English for education, employment, mobility, and access to global knowledge. Their challenges come from their economic situation. They lack access to power, connectivity, and Internet-enabled devices, but also lack access to suitable, trained teachers who can help them with digital access to knowledge and practice opportunities in schools, learning centres and universities.

At the moment, these learners are served by the state education systems, and where they can afford it, by low-cost private education systems, or if they are fortunate, by the support of charitable organisations and NGOs who run schools and colleges.

There are some corporate actors working with disadvantaged people at the bottom of the pyramid. Microsoft teamed up with the British Council in Project Badaliko, for example, to set up digital learning centres across Africa to bring digital learning opportunities to disadvantaged learners. Intel, the microprocessor company, has trained over 15 million teachers of maths and science in developing economies over the last 10 years, giving them the confidence to use digital technologies in school.

Some might ask why people in emerging economies need digital learning, when they have access to more traditional forms of education? Well, in theory they do. In many countries the traditional primary, secondary schools, and even the universities, can face major challenges to bring the desired level of education to the populations that they serve.

In many countries, learners only receive a primary education up to about the age of 12 or 14. In many countries, girls are not encouraged, and sometimes prevented, from going to school or

doi: 10.29366/2018tlc.2.4.1
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staying in school to the end of secondary education. In many cases, teachers are un(der)qualified, or inexperienced, and in extreme situations such as in Pakistan, a substantial proportion are absent from schools at any period of time. On an academic level, there can be problems with the curriculum, with access to appropriate learning materials, and with access to and rigour of assessment systems.

Thus, giving people digital access to enable them to extend their exposure to English, extend their time on task by giving opportunities for reading, listening, study activities, vocabulary extension and so on, is a valuable way to extend the English language learning opportunities for students in emerging economies.

4. EQUITY

For those of us in developed economies, our access to technology gives us such a privileged situation, because it brings access to global knowledge and opportunities for higher education, employment and mobility – exactly the life chances that students in emerging economies lack. Although Western economies spend billions in aid to emerging economies, it does not always find its way into classrooms, and certainly not English language teaching classrooms.

It ought to be a given that providing the wherewithal to learn English (such as alternative technology) would be a significant goal of the aid agencies working in developing countries. But the key NGO and state aid funding agencies seem to have overlooked the benefits to a developing population of improving the language skills that give them access to education, mobility and economic opportunities.

Britain's aid ministry, the Department for International Development (DFID), is a case in point. Despite a very generous budget (currently ca. £14 billion per year), it has for many years resisted any funding of English projects. This is largely the legacy of former Labour minister Clare Short, who apparently felt that learning English was an 'elitist' and 'colonial' pursuit. She disregarded the fact that many citizens of developed economies felt that English was the language of opportunity and liberation from poverty.

This reminds us of the arguments of Robert Phillipson, who believes that the idea of teaching English at all in developing countries is a form of imperialism (Phillipson, 1992).

Since then DFID has, with some exceptions like *English in Action* in Bangladesh, blocked any significant funding of English language education.

Most aid agencies are rightly concerned primarily with poverty alleviation, and with improving the

basic education of primary school children, especially girls. This is the most important focus, of course, but it is hard to see why a small slice of the £14 billion the UK spends on aid annually could not be targeted at improving access to educational technology and connectivity, so that disadvantaged students can get better opportunities to learn and expand their horizons.

When considering the so-called 'digital divide', it is very important to understand what actions need to be taken. It is not merely a question of technology access, as Brabazon (2013) explains: *'The digital divide is based on the assumption that access to technology is a proxy for learning how to use it'* (Brabazon, 2013, p. 71). We will look later at the issue of training and development of the digital literacies required to turn access into learning.

It is certainly a question of equity, of 'digital justice', in Brabazon's phrase: *'By committing to digital justice rather than lamenting the digital divide, citizens of the world can avoid a global monoculture, celebrate, preserve and encourage local languages'* (Brabazon, 2013, p. 85).
An early example of a country aiming to provide this equity is Finland. In 2010, the government of Finland enshrined broadband access into a 'right of citizenship'. This is certainly the preferred direction of travel; Brabazon claims that 'broadband is no longer only an enabler of entertainment and leisure, but the basis of social justice and equality' (Brabazon, 2013, p. 72).

5. ENGLISH OPENS DOORS

A series of reports from Euromonitor, funded by the British Council, built on the work of economist Francois Grin and made clear the advantages of learning English. The economic advantage to the individual is increased earning potential (from 25% up to 40% more income than with no English competence) and the benefit to the state is an increase in foreign direct investment from corporations who know they can find workers with sufficient levels of English. The report found the following:

'An important element of these growth strategies is recognition of the importance of English, in order to communicate in the international business world. A focus on improved language skills has helped to attract more foreign investment, further increasing the need for English speakers in these countries. This underpins the growth of national and individual wealth, and helps drive economic development. Workers with solid English language skills are therefore in the best position to take the fullest advantage of new opportunities in these rapidly developing economies' (Euromonitor, 2010, p. 4).

These reports make clear that the underserved have economic needs that are not being met.

doi: 10.29366/2018tlc.2.4.1
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6. SOLUTIONS

6.1 The potential of alternative technology

We have seen that the underserved lack access to technology, lack equity and digital justice, and need English in order to develop economic opportunities. What are the potential solutions? Apart from unrealistically large financial investments that would be needed to provide first world infrastructure everywhere, the key factor here is the provision of alternative technologies that get around the constraints of power and connectivity.

What attracted me to the world of 'alternative' technology is the energy and innovative spirt of the people who are trying to reverse this marginalisation while keeping a close eye on the cost to users. There is no point in coming up with incredibly innovative new technologies if they are so expensive that no individual, school or village can afford them, and only Western governments can utilise them. Interactive whiteboards come to mind here, as a prime example of the most over-rated and over-priced edtech (though this view may cue howls of outrage from some quarters).

6.2 Power

To solve the issue of access to electricity and reliable power, a number of organisations have been offering solar-powered technology. A good example is *Lifeline Energy*, run by Kristine Pearson in South Africa, which provides solar-powered radios and MP3 players to allow teachers and community leaders to bring audio content into rural areas and isolated villages without reliable power. The MP3 unit can record radio broadcasts for later sharing, and can be updated with new content by adding cheap memory cards in the front panel slot.

While at the British Council, I set up a project with this NGO to buy large quantities of their solar-powered MP3 player, called the *LifePlayer* and to equip them with memory cards containing the British Council's listening material, podcasts, and teacher training material in audio format so that this could be used in low resource contexts for English language learning.

This has been successfully rolled out in Kenya, Mozambique and Ethiopia, allowing around 60,000 students and teachers to gain access to materials that would otherwise be too difficult to deliver via traditional publishing or broadcasting.

All this technology requires for wider rollout is a small investment in devices and access to open-source material (such as that above) that can be duplicated and distributed at low cost.

6.3 Connectivity

To solve the problem of lack of connectivity in remote and rural areas or undeveloped areas, we need to look at the advances in long-distance wireless connectivity.

Intel have developed a new type of wireless Wi-Fi called *WiMax*, which can send Wi-Fi signals up to 5 miles along line of sight from antenna to antenna. This is used in some rural areas in England, where phoneline-based broadband is unavailable or too slow for people who need to work remotely. One cooperative village Internet provider in Norfolk, for example, broadcasts Wi-Fi from a dish on the tower of the village church.

The second connectivity support is to provide prepaid telco programmes. This is relevant if students have an Internet-enabled phone and a strong enough signal to be able to connect to the Internet from their location, but the cost of a monthly data subscription is far too high for them to afford. The solution is to give them cheaper access through a prepaid card, which works like a scratchcard with a code number. For a small fee this gives, for example, one gigabyte of data access but does not commit users to an ongoing monthly subscription, which would be unaffordable.

Intel have developed several programmes like this, including with the Vietnamese Ministry of Education, in order to help people access the Internet via PC or phone at an acceptable cost.

6.4 Portable servers

Another kind of connectivity solution is to move the content that students need to access closer to the students themselves – away from the open Internet that they cannot access. Instead of giving students open access to the Internet, it can be educationally appropriate to provide students localised Wi-Fi access to selected and curated educational and open knowledge content, which they can access through a portable local server.

Of course, many schools in remote areas do not have traditional servers or the IT staff to maintain them, so a solution is to use portable offline servers. A portable offline server combines in one box the teacher's need for connectivity, Wi-Fi, storage of material and electrical power. It is essentially a modified router, Wi-Fi access point and storage server squeezed into one small box, about the size of a A5 notebook.

In addition to the router (the device used in any home or office to connect to the Internet and provide Wi-Fi access), the unit has a hard drive to hold content selected by the teacher or school, and a rechargeable battery.

When it is set up in a school or learning centre with a live Internet connection, material can be downloaded from the web on to the server. Teachers can also download on to it any type of content stored locally in their school, or created locally, and organise it for access by the whole class (such as audio or video files or PDF documents). This content is all accessible via the Wi-Fi hotspot to anyone with a browser and a Wi-

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Fi device, even when the server is disconnected from the Internet – it is self-sufficient. It runs off its battery power, long enough for a school day, and it creates its own Wi-Fi hotspot to 'feed' devices near to it. Students use phones or tablets to get wireless access to the curated content on the server's hard drive, which is accessed via a standard browser.

As the server is portable and self-contained, it can be moved from room to room in a school, or used outdoors in a more remote and rural location where there is no electricity and no external connectivity. The unit can be recharged in a location with electricity, and then used in any location where there is no electricity and no external connectivity. The advantage of this solution is that teachers or schools or educational aid groups can preselect and load content onto these portable servers, via network or USB or memory card, charge them up in a central location and send them out with a group of phones or tablets or laptops to be used anywhere in the field.

6.5 Server devices

The Intel version of this concept is called an 'education content access point' and costs around $250-$300 (Intel, 2016). There are other versions of the same licensed design available, such as *MyMaga* from Portugal and other similar devices with different designs, some based on cheap Raspberry Pi computers, available from projects such as *Internet in a Box* and *MundoPosible*.

A current example of this implementation is the *RACHEL Project*. RACHEL stands for *Remote Area Community Hotspot for Education and Learning*. The charity that runs the RACHEL Project, WorldPossible, is determined to bring connectivity to the 60% of the world's population that remains offline. This population is predominantly rural, low income, elderly, illiterate, or female (WorldPossible, 2018).

'A common refrain we hear is that children are in school, the teacher is there, but no-one is learning. Offline content serves as a resource for students and teachers to not just educate themselves, but also develop vital 21st century skills in digital literacy, research and critical thinking' (Jeremy Schwarz as cited in Carrier, 2017).

The RACHEL server runs on open-source software (Ubuntu) and drives tablets and notebooks in a small offline learning lab, hosts off-line copies of websites, audio files, PDF reading texts, lesson plans, video clips and anything else that a standard browser can access.

'Today the students felt empowered. No longer were they dependent on what the teacher could teach them at the blackboard. No longer did those who got it need to wait on the others who need more time' (Jeremy Schwarz as cited in Carrier, 2017).

6.6 Offline content

A portable server, however accessible, is not much use without good learning content. Local teachers cannot be expected to always create their own material, so they need to be directed to external sources that are free.

Sources of offline content are rich and varied, as open educational resources (OER) are being built up and extended in a number of different repositories, British Council being a prime example.

The RACHEL Project offers offline versions of Wikipedia, TED talks, 400 books from the Gutenberg Project, the African story book project, and radio lab. Other similar sources include organisations such as *eGranary, Loan Equality* and *Kiwix*.

Schools and teachers can provide their own offline content simply by making any kind of locally available or downloadable English language teaching material available in browser-readable format. This means that material such as PDF documents, listening files in MP3 format and videos in MP4 format can be shared and downloaded into the server device without conversion and used in class.

6.7 Student access technology

Of course, none of this is of much use unless students have devices which can access the Internet directly or via the offline server. Students need a device with a browser to 'read' this content.

The penetration of mobile phones even in emerging economies is extremely high and by 2022 it is estimated that there will be 8.9 billion mobile subscriptions and 6.1 billion unique mobile subscribers, which is almost one for every person alive on the planet.

It is therefore likely that in most locations a sufficient number of students in the class will have access to a phone that can be used to access learning content with a browser application on the phone. Even older non-Internet phones (feature phones) are often supplied with a simple browser application and local Wi-Fi capability. If not, schools and aid projects need to develop loan systems so that the teacher can bring one device per group of students into a class along with the offline server.

Where this is not possible, then the students can

doi: 10.29366/2018tlc.2.4.1
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also access learning content as a group rather than individually.

Teachers can provide the class access to the learning material from the teacher's phone or tablet, by connecting it to a portable projector (for example a *Pico* or handheld projector) and displaying this on a white wall, or a wall covered with a white sheet of paper. Pico projectors are not particularly cheap (about £200-250), but cheaper than a set of 50 tablets.

6.8 PC replacement technology

Some aid projects have invested in setting up computer labs in schools in emerging economies in order to help students get access to connectivity. This is excellent but expensive, not only in terms of procurement but in terms of the need for specialised setup and maintenance skills. It is likely that standalone PCs will cease to be necessary for this kind of implementation, because of the ubiquity of smartphones which are increasingly available for as little as $25-$50.

For ease of use by groups of learners, these smartphones can now be connected to screens and keyboards to create a PC-equivalent experience for learners. New adapters such as Microsoft's *Continuum adapter* and the Samsung *DEX adapter* make it possible for any phone to act as a personal computer and be connected to a full-sized monitor and keyboard.

7. CASE STUDIES

There are many past and current projects which use clever technology solutions to improve the equity of access to learning materials and global knowledge for students in low resource contexts.

For example, the *English in Action* project in Bangladesh, managed by the Open University, BBC and Cambridge Education has brought audio and video learning materials and teacher training materials to classes by using memory cards inserted into Nokia phones, which are then connected to speakers or television (English in Action, 2017).

In Rwanda, there has been an extensive *One Laptop Per Child* project bringing device access to students using the low-cost OLPC laptops, with customised English language learning software, some utilising the open educational resources from the British Council (OLPC, 2017).

A different approach was used in Uruguay, where remote schools did not have access to English language teachers. In an ambitious programme called *Plan Ceibal*, the country connected all the remote schools by fibre optic cable to the capital city, so the live video conference teaching could be broadcast to each school individually. Each class got one or two lessons per week of the specialised English teacher from a remote site, teaching via live videoconference link, while the

local teacher in the classroom assisted with activity implementation (Plan Ceibal, 2017).

In Guatemala, schools were challenged by a lack of connectivity in rural areas so a project called *MundoPosible Guatemala* installed RACHEL-Plus off-line servers in 44 schools, trained 743 teachers, and provided offline content to more than 14,000 learners (WorldPossible, 2017).

The RACHEL project has been expanded to partnerships in 47 countries including Namibia, Sierra Leone, Kenya, Ghana, Tanzania. The servers are used by over 500,000 learners around the world, providing free open educational resources that support teachers as well as learners.

8. OPEN SOURCE ELT

These kinds of solutions make clear that the technology can be made available to solve these challenges, but appropriate teaching and learning depends on the availability of inexpensive or free open source teaching resources. These are not just lesson plans and lesson activities, but assessment tests, curriculum designs, textbooks, and readers.

Of course, there are some OER resources already, such as the British Council *LearnEnglish* and *TeachEnglish* websites which provide large amounts of free material of high quality. Most of it is for self-access rather than classroom use in structured course delivery.

The team behind the RACHEL project has led the way by creating a new online repository of OER materials, called *OER2Go*. The project team takes content from OER sources and customises it (with permission) so it can be used with offline servers like RACHEL, with no connection to the external Internet.

Similarly, a US non-profit, the *Widernet Project*, which is dedicated to improving digital education, has developed an OER solution that is very easy to use, as the OER resources are not online but housed in an 'appliance', the eGranary Digital Library. This is essentially an offline server, an 'Internet-in-a-box' solution that stores thousands of pages of learning materials, including offline websites, for students to use in an institutional setting. The eGranary project 'provides millions of digital educational resources to institutions lacking adequate Internet access. The eGranary is much more than just static information: the digital library contains built-in tools for subscribers to upload and edit local materials as well as create and edit their own websites, which are stored locally' (eGranary, 2017).

It is hoped that there will be more developments in creating and sharing for free open source (OER) English language teaching materials either created by teachers, or released into the public domain by publishers once a textbook or reader is no longer appropriate for global sales. Publishers of English

doi: 10.29366/2018tlc.2.4.1
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language classroom textbooks and materials issue new textbooks every year, and often remove older versions from sale. It would be possible for them to donate the content of these out-of-print materials for use in open-source environments as described above. Many textbooks from 10 years ago are no longer on sale, but could still represent a great learning support for students in emerging economies if they could have free access to the content.

Ideally, an English Language Teaching OER repository would contain more than lesson activities, and its core would include:

- core curriculum;
- core training course design;
- core placement test;
- core achievement tests;
- core textbook;
- core skills development;
- core readers.

Most of these core ELT resources are only available as commercial purchases, and it is necessary that an OER project be initiated to collect non-copyright and non-commercial versions of these resources, to be shared with the underserved.

9. TRAINING AND SUPPORT

9.1 A range of actions to be taken

When considering the so-called 'digital divide' and how to fix it, it is important to understand what range of actions need to be taken.

'The digital divide is essentially based on the assumption that access to technology is a proxy for learning how to use it' (Brabazon, 2013, p. 71). Obviously, access alone is not enough. As Brabazon points out, *'access is the preliminary stage in the project of learning'* (Brabazon, 2013, p. 72).

Brabazon cites the OLPC project as a negative example, explaining, *'we do not focus on computer literacy, as that is a by-product of the fluency children will gain through use of the laptop for learning'* (Brabazon, 2013, p. 71). This is also the view taken by Sugata Mitra whose famous *Computer in a Hole in the Wall* project in India raised manifestly unrealistic expectations that learners did not need teacher support any more (Mitra, 2012).

It is clear that both teachers and learners need support and development to help them make use of these new technologies. Projects designed to bring alternative technologies to underserved areas need to ensure that a significant part of the budget and time allocation is devoted to this training and support. Therefore, any project focused on bringing new technology to local learners must also focus on how to implement training for both teachers and learners. It is important to ensure they both develop digital literacy competences so that they

can make best use of the technology to achieve learning outcomes. This includes supplying professional development for teachers, modifying and updating the curriculum, supplying learning materials and resources (online and offline), and helping learners develop lifelong learning strategies. In most cases, learners need to be guided to use new technology, and a structured learning experience based on a structured curriculum and carefully prepared learning resources is more likely to be of lasting value.

9.2 Digital literacy

Both teachers and learners need to develop digital literacy skills and competences. Digital literacy has been defined by Paul Gilster as 'the ability to both understand and use digitised information' (Gilster, 1997, p. 2).

Digital literacy is important for all teachers and learners in developing economies, whether they are 'digital natives' or 'digital immigrants'. It is important for language teachers as more and more language teaching resources are available in digital formats, and more and more schools use digital devices to teach, and more and more students have access to digital world outside their classroom.

Hockly et al. (2014) define digital literacies as 'the individual and social skills needed to effectively interpret, manage, share and create meaning in the growing range of digital communication channels' (Hockley et al., 2014, p. 2). They set out a digital literacy framework that covers the following areas.

1. A focus on language: print and texting literacies, mobile, gaming, hypertext, code. This includes reading online, understanding texts and texting, understanding hypertext links, how to navigate on the web, and how to work with games and game-like learning.

2. A focus on connections: personal, participatory, network and intercultural literacies. These literacies include operating in social networking spaces, which includes blogs, wikis, and social media like Facebook.

3. A focus on information: search, information and tagging literacies. This means knowing how to search online and find (and evaluate) useful and reliable information.

4. A focus on (re)design: remix literacy. This more advanced competence includes modifying media, remixing and creating 'mashups' by combining text and images from different media. This is largely beyond the context of the underserved, except that the competence to record voice, take photos and marry them together to tell stories is well within the confines of the low technology resource provided.

doi: 10.29366/2018tlc.2.4.1
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9.3 Digital natives and immigrants

A central part of the development and support teachers need is help in understanding their learners and their needs. Some concepts can be misleading, however. Marc Prensky introduced, or at least popularised, the concepts of 'digital native' and 'digital immigrant' (Prensky, 2001). He intended to highlight the new skills that younger learners, born into a digital and Internet age, would have from their early life experience, whereas older learners would need to have learned these skills. This distinction has now been largely discredited as inaccurate and somewhat ageist, but the terminology is still in use. It is inaccurate because not all young people know how to use technology well, and not all over-30-year-olds are incapable of learning digital skills.

What many of these experts like Prensky (2001) and Phillipson (1992) have in common is the view that only they can advise on the 'right' way for learners to succeed.

In looking to support the underserved learners, we need to be more open to new varied and even contradictory ways to support learning through technology, including through alternative technology that is matched to the local resources.

9.4 The digital teacher

One useful tool or resource for developing teacher training programmes in digital skills is the digital competence framework developed by ELTjam and Cambridge Assessment English (ELTJam, 2017). This framework consists of a bank of can-do statements outlining digital teaching competences, at different levels of teacher experience and qualification. It is based on the research-led Cambridge CPD Framework which I initiated while consulting for Cambridge English, which builds on the EAQUALS and British Council frameworks and combines the CEFR approach to can-do statements with teacher competences required at each stage of a career.

This resource provides also hints and tips for how to use certain hardware and software in class, and how to further develop one's skills. The range of competences outlined is more complex than those required in a more restricted learning context such as described in this paper, but the core principle of analysing and training teacher digital competences still stands. The core framework defines competences under these headings which are just as applicable to low-resource contexts:

- *The Digital World:* how teachers can be digital citizens, utilise the opportunities and keep students safe in an online environment;
- *The Digital Classroom:* how teachers can develop their awareness of what is available in digital learning, what theories and methodologies are appropriate and

what tools and resources are relevant to their context;

- *The Digital Teacher:* how teachers can improve their own professional development and work with peers to build broader competences;

- *Designing Learning:* how to select, evaluate and use digital resources in lesson planning, linking digital content to the curriculum;

- *Delivering Learning:* how to communicate effectively with students and develop their skills in utilising digital tools;

- *Evaluating Learning:* how to assess student progress using digital tools and assess the effectiveness of the digital implementation.

Ideally, to better serve the underserved teachers, a simpler and more concise Digital Skills Framework needs to be designed that is more closely mapped to the sort of digital devices and resources that would be available in low resource contexts. This work has yet to be done but might include a simple definition of competences – and training activities – for each of these areas:

Teachers:

- how to use (i.e. 'operate') the technology supplied;
- how to design curriculum content;
- how to use in class;
- how to support learners using tech outside class.

Learners:

- how to use the technology supplied;
- how to learn interactively in pairs and groups with technology;
- how to practise outside class;
- how to build a lifelong learning strategy and habit.

10. CONCLUSION

What is it that the underserved communities really need, and how can we help them to access this? It is clear that underserved communities of students need equitable access to education and therefore higher levels of English that will enable them to further their education and get broader opportunities in life. It is clear that these underserved communities therefore need new radical innovation in digital infrastructure and connectivity in order to get access to global knowledge and English language teaching materials that will help.

It seems only fair that we should look for ways to share the benefits that we in richer countries have experienced, and some of these 'alternative' technologies may help to bridge that digital divide.

doi: 10.29366/2018tlc.2.4.1
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We will need more investment help, perhaps via edtech NGOs that gain funding for such work, and we will need much wider access to open-source language learning materials to use as content for the alternative technologies. But it can be done.

Given their lack of economic resources, it is also clear that they need access to good, free, Open Source ELT content as they cannot be expected to pay western publishers' commercial prices. Similarly, the teachers of the 'Next Billion' learners of English need access to good, free, Open Source training and CPD opportunities as well as Open Source curricula and assessment content.

What can we do? We can donate materials to projects like WorldPossible in Guatemala. We can volunteer to write learning materials that can be used in open source contexts. We can influence our professional networks to get involved – lobby, act, train, donate or write material, or fundraise for technology purchase. Above all, we can spread the word that providing access to English language learning for the underserved communities can be greatly helped by taking a radical view of technology solutions and open source content.

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