

Technology-supported Innovation in Education

Technology, particularly mobile, is contributing significantly to high quality teaching and learning across the world. In Ghana however equipment, technical know-how and online connectivity are often unavailable, so that vital teaching and learning materials and tools are inaccessible to many educators. This has a direct impact on teachers' ability to equip Ghana's children with the skills and knowledge needed to succeed in the modern world.

Transforming Teacher Education and Learning (T-TEL), a four year Government of Ghana programme supported by UK Aid, is providing Colleges of Education (CoEs/colleges) with cutting edge mobile technology and expertise from Ghana and beyond. These inputs are designed to enable access to information and materials on effective teaching and learning; enhance the professional development of teachers; and build communities of practice amongst teacher education professionals, at a faster and more cost effective rate.

This policy brief describes how T-TEL is delivering these technological innovations, and the impact they will have on teacher education in Ghana long-term.

Increasing access to teaching and learning for Colleges of Education

Globally, education professionals routinely use the Internet to access useful resources for their professional development, on top of what they learn in the classroom.

In principle, all 38 Colleges of Education should be connected to the Internet, but in practice there are often obstacles.

While T-TEL is supporting colleges to find ways to ensure effective Internet access, for many CoEs – including the most remote or under-resourced - the Internet is likely to remain a constrained resource for some time.

To address this and make the most of limited connectivity, T-TEL is providing colleges with a selection of educational resources using a low-cost computer: **The Raspberry Pi**. Developed at the University of Cambridge, the device is one of the most widely-used low-cost credit-card sized "single-board" computers. To our knowledge, this is the first time a UKAid-supported programme has used technology of this kind.

Building on the work of **Open Learning Exchange Ghana**, a non-governmental organisation ensuring children acquire basic educational skills, the Raspberry Pi connects to

the College WiFi - or creates an independent network. This provides access to educational resources, including materials for tutors and teachers, information from Wikipedia and of course T-TEL materials and publications.

Tutors and students in some colleges can already access the Internet in theory using their phones. However, if they cannot connect through the CoE Wifi network, they often can't afford mobile airtime to connect. The Raspberry Pi provides access to resources whether or not the college has a functioning Internet connection.

Mobile technology to promote learning

T-TEL is also providing a **set of tablets** to each college, which instead of focusing on content, use mobile technology to grant access to engaging learning opportunities and introduce students to innovative teaching methods. T-TEL is using the tablets in accordance with established research and well-tested pedagogies - such as collaborative learning and enquiry-based learning .

Tutors learn how to use tablets as teaching resources during professional development sessions. This might include the use of GeoGebra (an interactive mathematics application). If the tutor needs further resources, they can then access them on the Raspberry Pi. After these sessions, tutors can use the tablets with student teachers in their own maths lessons.

Both Raspberry Pis and tablets are tools to help colleges deliver a better level of teacher education. Though they cannot provide mobile access for all students in one college or enhance learning without other interventions,

these devices demonstrate the value of technological resources and digital learning for teacher education, to help colleges embed these practices into their curriculum.

What's more, the technologies enable a high level of teaching to be available at all 38 colleges, and tutors equipped to use them can lay the groundwork for the expansion of connectivity and technology in colleges for the foreseeable future.

Using social media to build communities of practice

Facebook and other communication platforms such as WhatsApp and Google Hangouts, are helping T-TEL bring its programme participants closer together. Professional development groups on social media platforms are connecting college tutors, Professional Development Coordinators (PDCs) and T-TEL Teaching and Learning Advisers (TLAs), who share information and photos of training sessions, as well as discuss professional development.

Many tutors are already so accustomed to using these social platforms, that a constant flurry of comments, photos, documents and videos has been shared since the start of the professional development programme.

Social media platforms like Facebook are highly effective for education engagement in Ghana and are quickly replacing tools like SMS.

T-TEL will build on this mobilisation through social media for continued learning and shared valuable experience and practice throughout its work.



This policy brief was created from research conducted by Open Educational Resources, the Open University and TESS-India. For more information, visit the links below:

<http://doi.org/10.1111/jcal.12123>

http://oer.educ.cam.ac.uk/wiki/Video/Abel_rectangles

www.oer4schools.org

<http://www.tess-india.edu.in/>

The global education community and Equitable Education for All

One of T-TEL's core programme principles is a commitment to sharing resources with the global education community.

All published T-TEL materials are Open Educational Resources, using a Creative Commons license, which allows anyone to use, adapt, and share them free of charge anywhere in the world.



Significant evidence shows that open publishing models offer better value for money than traditional copyrighted resources.

While T-TEL materials have been tailored specifically to the Ghanaian education context, they can be easily adapted to others. At present, there are very few open tutor/teacher education programmes such as T-TEL in action, despite a pressing need for more professional development opportunities in sub-Saharan Africa.

By offering T-TEL resources as Open Educational Resources, the Government of Ghana and UKAid are ensuring that T-TEL is contributing to education efforts elsewhere, supporting the UN's 4th Sustainable Development Goal: Equitable Education for All. This approach aligns with T-TEL and the Government of Ghana's principles of providing transparency and value-for-money in teacher education - ensuring that as many people as possible benefit from our efforts in a sustainable and scalable way.

ENABLING IMPROVED TEACHER EDUCATION FOR THE FUTURE

Despite the challenges in building the 'know-how' of technology and its opportunities, T-TEL is committed to using devices and materials that enhance and improve the learning experience and teaching strategies for the next cohort of teachers in Ghana.

With the right support, tutors and student teachers in CoEs – as well as the teacher education sector as a whole - can access quality resources and deliver better results in teacher education for the long-term benefit of pupils, schools and their communities.



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