Dear readers,

The theme of our October edition is “1-to-1 Computing for Education”. With the boom of such initiatives, and the growing interest in implementing these programmes by governments and other stakeholders, it is relevant to understand this trend better for the sake of effectiveness and educational impact. Other approaches, such as “Bring Your Own Device/Tablet” (BYOD/BYOT), as well as “One Mouse Per Child” vs. “One Computer Per Child” have received attention. Additionally, there have been debates on whether the devices should be in the hands of the students or the teachers.

However, it is crucial to keep in mind that whatever the initiative, whether it is 1:1, or 1:4, using whichever device (mobile phone, tablet, computer), it is not the actual technology that makes the difference, but use them effectively to achieve targeted learning outcomes.

In this edition, we will focus on both benefits and challenges of 1-to-1 computing in education. It is, however, important to keep in mind that the research on these initiatives is still limited and polarized due to its relatively nascent nature.

We hope that you enjoy reading this edition!

Please let us know if you have any comments or suggestions.

Highlights:

**1:1 Computing: Reality, Possibilities and Ways Forward** (by UNESCO Bangkok, ICT in Education)
An overview of 1:1 computing, initiatives, pitfalls and opportunities presented by the ICT in Education team, UNESCO Bangkok.

As 1-to-1 (1:1) computing has gained more prominence in the education and ICT arenas, more questions and debates have arisen as to what the definition is, what devices to use, and how much it will actually affect the educational outcomes across the globe. Governments, NGOs, international organizations as well as private companies have initiated many of such programmes, spending massive amounts of money on laptops, iPads and various other devices to bring about literacy, provide greater access to educational opportunities, and enhance quality of learning. However, solid research on the topic has been quite scarce, oftentimes polarized and inconsistent, especially in the Asia-Pacific region. Reasons may be that the beginning stages of implementation and the distribution of technology are usually the main focus (Richardson et al., 2013). Some claim that 1:1 computing has the power to bridge the digital and knowledge gap, others state that it is yet another “hot” initiative that will bring about none or minimal educational results. Initiatives such as “Bring Your Own Technology/Device” have arisen alongside 1:1 computing. Debates of whether the teachers should have the devices or the students have moved the discussion in a different direction. Other programmes, such as “One Mouse Per Child” have expanded the idea of 1:1 computing.
There is no agreement on the definition of what exactly constitutes 1:1 computing. Usually, it focuses on the number of devices per a number of students. The device itself can be a tablet, a phone, or a computer, and the minimum level of access to these also depends on various contexts. The aptitude of the device also varies, spanning from either very powerful and evolved or on the other hand, outdated and slow (Richardson et al., 2013).

According to Bebell & O’Dwyer (2010), frequently, there seems to be little focus on the actual teaching methods, leadership, technical support and training.

Some of the large-scale global 1:1 initiatives span from Argentina to Rwanda, from Israel to Peru, from the US to the Republic of Korea. In the Asia-Pacific region, OLPC programmes were quite prominent in the past years until its recent discontinuation. However, other prominent programmes do exist in countries such as Australia, Bangladesh, Brunei Darussalam, Nepal, and Turkey, to name a few. Many of 1:1 computing initiatives have not brought about significant educational results, and some have shown promise. Some of the main pitfalls include a lack of vision in national policies that are too often focused on the technology instead of pedagogy, being driven by a wish or pressure to gain public attention as well as a crave for something modern and trendy, leading to quick large-scale project implementations with little educational goals or results; lack of teacher and staff training or technical support, accompanied by financial strain on governments or other implementers (UNESCO-UIS, 2014; Weston & Bain, 2010).

Although the full potential of 1:1 computing is yet to be discovered, the question of access privilege has to be seriously considered. Thus, effective and smart partnerships and collaboration are crucial in reaching educational goals and changes in this sphere (UNESCO, n.d.). It is also extremely important to contextualize 1:1 computing goals, introduce such projects in a planned way, conduct evaluation, and consider technology readiness of the students, teachers, and other users to provide appropriate training (HP, Microsoft, & Intel, 2005; Twining et al., 2005). Finally, it is important to integrate devices into the curriculum and inform users of digital safety and maintenance (Weston & Bain, 2010). In today’s digital world, it is crucial to raise responsible consumers, users and creators of content and technologies.

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References:


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1:1 computer initiatives are the latest iteration of the long-held mythical belief that education can be dramatically changed by the introduction of new technologies into the classroom. In 1913, the American inventor, Thomas Edison, was interviewed about the educational potential of the motion picture system that had been developed at his famous Menlo Park lab. Edison enthusiastically declared, “Books will soon be obsolete in the public schools. Scholars will be instructed through the eye. It is possible to teach every branch of human knowledge with the motion picture. Our school system will be completely changed inside of ten years.”

Of course, Mr. Edison’s predictions did not come true, but hyperbolic forecasts of this kind have been made by the developers and financial interests behind every new technology introduced into education ever since, with similar dismal results. As documented by the Stanford University Professor Larry Cuban in books such as Teachers and Machines: The Classroom Use of Technology Since 1920 and Oversold and Underused: Computers in the Classroom, when technology is introduced into classrooms without also fundamentally changing the nature of the teaching practices and the learning environment, there are no significant differences in outcomes. This “no significant differences” problem for educational technology is also clearly illustrated by the decades of research synthesized by University of Melbourne Professor John Hattie’s book Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement.

What does improve educational outcomes? According to Hattie’s research as well as other studies, the fundamental variables of educational change include:

- Formative evaluation of teaching performance
- Teacher clarity in presentations and demonstrations
- Feedback to learners on their learning progress
- Self-verbalization and self-questioning
- Mastery learning (holding students to high standards)
- Spaced opportunities to practice
- Time-on-task
Educational technologies can serve as vehicles for the implementation of these and related variables in classroom instruction. But technologies do not impact learning directly any more than the various “media” that deliver a pain reliever such as aspirin affects pain. The acid compound in aspirin (including a carboxylic acid functional group and an ester functional group) decreases pain, but it can be delivered in many different formats such as tablets, capsules, and even chewing gum. Some formats may be less expensive, some may be easier to swallow, etc., but it is getting the acid compound in the bloodstream that really counts.

Similarly, in the classroom, unless we enhance foundational teaching and learning variables such as the ones listed above, we cannot expect educational outcomes to improve. 1:1 computing initiatives or the widespread adoption of tablet computers in schools are presently largely solutions in search of problems. There are more than enough problems in education in every region of the world and at every level such as:

- Ineffective teaching
- Inadequate higher order learning
- Poor learner motivation
- Failure to engage
- Little preparation for real world
- Lack of intellectual curiosity
- Undeveloped creativity
- Weak communication skills
- Insufficient time-on-task

Individual schools or school systems should first decide which mix of these problems or other specific challenges they want to target for improvement. Then they should identify the foundational educational variables that need to be introduced or boosted to solve these problems. Consider formative evaluation of teaching performance so that teachers can have a much sounder basis for planning the lessons and strategies they will employ to help their students learn. It may well be that some sort of technological innovation may have a role in an effort to enhance formative evaluation of teaching, but that won’t be clear onto the nature of the problem and the range of possible solutions are carefully studied.

This process should be driven not by the sales pitches of technology company representatives, but through a rigorous process of “educational design research” (also known as “design-based research”). Educational researchers from universities and NGOs should collaborate with teachers and other practitioners in these design research efforts. The largely fruitless results of previous educational technology research studies have been focused far too much on things (e.g., tablet computers) rather than problems (e.g., the lack of readiness for higher education endemic among high school graduates in most countries). Educational design research fundamentally shift the focus of educational technology research from “what works?” questions to “what is the problem and how can we solve it?” intentions. This is the only socially responsible way forward.

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Programmes and Projects:

- **OLE Nepal**
The Open Learning Exchange organization provides free educational content as well as teacher training, local capacity development, and technology in rural areas of Nepal.

- **E-Paath**
provides digital learning materials that are aligned with the national curriculum in Nepal, designed by education experts. English, Mathematics, Science and Nepali language courses are provided.

- **E-Pustakalaya**
is the digital library with books, video and audio files and other educational materials with various themes attainable through Intranet or the Internet.

- **Facing the challenges of the One-Tablet-Per-Child policy in Thai primary school education**
This article provides an analysis of the unsuccessful OTPC initiative in the Thai context and identifies the pitfalls. Some of them included lack of a contextualized approach, device effectiveness, teacher guidance, and assessment.

- **Turkey's FATIH Project: A Plan to Conquer the Digital Divide or a Technological Leap of Faith?**
This study provides an analysis of FATIH, one of the largest educational technology projects in the world implemented by the Ministry of National Education of the Republic of Turkey, giving recommendations for the next steps. It also hopes that FATIH can learn from hard lessons of similar international projects that can help this initiative transform the education field and make an actual educational impact.

- **The Aakash, India's $35 (?) Tablet for Education**
3 years ago, the launch of “Aakash” was announced by the Indian Ministry of Human Resource Development., the cheapest tablet on the market. This article by Michael Trucano provides some comments on this project.

- **One Mouse Per Child**
One Mouse Per Child takes the approach of using multiple mice by students in the same classroom or learning environment to participate in a single display simultaneously on the same machine. This page provides a brief overview of this approach, research initiatives, and ways forward.

- **Analysis of recent 1:1 learning initiatives in primary and secondary schools in Europe**
This article provides a description of 1:1 initiatives in Europe and feedback on better approaches toward long-term goals, reiterating the fact that teachers are key in any technological initiative.

News and Events:

- **Asia-Pacific Programme of Educational Innovation Development: 17th UNESCO-APEID Conference**
(29-31 October, 2014. Bangkok, Thailand)
The conference’s theme this year is “The Powerhouses of Education: Teachers for the Future We Want.” Some of the major goals for the conference include trying to answer some of the big questions on teacher performance, how teachers can be better assisted, what policies should be developed for teachers to be able to do their job better, and much more.
This event is hosted by the Korean Ministry of Education and the World Bank and organized by the Korea Education and Research Information Service (KERIS) in partnerships with UNESCO Asia Pacific Regional Bureau for Education and Intel Asia Pacific. This symposium aims to gather leading researchers, practitioners and other officials to share their experiences, knowledge and lessons learned in the area of 1:1 computing, focusing on a range of themes and contexts.

This event hopes to provide a platform for an exchange of ideas, experiences, opinions and strategies in the area of reflective teaching, a crucial step in becoming better educators and sustaining continuing growth.

BETT Asia Leadership Summit (2-4 December, 2014. Marina Bay Sands, Singapore)
For education and technology experts, BETT provides events to promote further investigation and research of technology in order to improve its potential in learning and classrooms. This summit hopes to encourage debate and collaboration as well as sharing of ideas on how to improve education through the use of technology, with a focus on Asia.

Resources:

Big educational laptop and tablet projects - Ten countries to learn from
This World Bank Blog on ICT use in Education, *EduTech*, written by Michael Trucano, Senior ICT and Education Policy Specialist, provides interesting updates on the strides and debates within the ICT in Education field. In this specific blog post, Trucano addresses the sudden boom of 1:1 initiatives across the world. Some of the examples include the US, Uruguay, Thailand, Peru, Kenya and Rwanda, Turkey, India, Argentina, and Portugal. This list is not exhaustive, but provides an idea of what has been happening in the field of 1:1 computing. Trucano also briefly addresses some of the factors to consider when implementing such projects.

Discovery Education
This site is a useful resource for K-12 teachers to find inspiration and actual activities to incorporate in their classrooms, but also tools and support for students and parents.

The Power of Cloud Computing?
This article discusses an alternative way of saving on costs through cloud computing on which the user can store data. Examples of cloud computing already exist, such as Gmail, Google Docs, Dropbox, and others. But it could also be useful for educational purposes.

The Anytime Anywhere Learning Foundation
This website provides research and resources for 1:1 initiatives, and many more useful tools and tips.

European Schoolnet resources:
• **Future Classroom Lab**
  An interesting teaching and learning space, or “Living Lab”, is meant to provide a new way to interact with ICTs. iTEC, CPDLab, Living Schools Lab and Creative Classrooms Lab are all part of the Future Classroom Lab project.

• **iTEC**
  A new initiative aimed at changing the way technology is perceived and utilized in classrooms that includes educational tools and other useful resources.

• **CPDLab**
  This project focuses on professional development within the scope of ICT for school staff, teachers and teacher educators.

• **Living Schools Lab**
  This project is a form of a platform for schools to share their innovative experiences and approaches to learn from each other. It is also a way to further study and explore ways to enhance these practices as well as provide professional development.

• **Creative Classrooms Lab**
  This project aims at collecting data and research in order to assess the impact of 1:1 computing on learning outcomes.

• **1:1 pedagogy for schools**
  This platform provides information and tools for 1:1 lessons and a way to exchange experiences and ideas with other teachers.

**New Publications:**

- **Infinite Connections: Education and new technologies. Trends Shaping Education 2014 Spotlight 5**
  This OECD publication focuses the rapid growth of Internet users, the second digital divide, cyber safety and bullying, reasonable expectations for technology and ways forward.

- **The Little Data Book on Information and Communication Technology 2014**
  This recent World Bank publication provides data on technologies and telecommunication sectors in more than 200 countries, focusing on a variety of indicators, including access, quality, affordability, capacity and much more. The sub-region and income-based sections make it easy to navigate and visualize the data.

**Next Issue:** The November issue will focus on “Assistive Technology”, with South Asia featured in the Sub-Regional Corner. If our readers are interested in contributing to this edition, please do not hesitate to contact us.

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