PDF ISBN 978-92-76-25181-1 ISSN 1977-6411 doi: 10.2841/831992 MN-BB-20-013-EN-N JANUARY 2020

PRACTICAL GUIDANCE NOTE 12

MAINSTREAMING DIGITAL TECHNOLOGY IN EU SUPPORT TO EDUCATION

1. Topic overview

Summary

- With an increasing interest and investment in technology in education, we need to ensure reforms are driven by educational objectives and good practice.
- For technology to enhance teaching and learning, we should focus on teacher capacity and support, as well as high quality materials.
- Technology-based innovations can drive timely and reliable data, focusing on school level.
- Mainstreaming digital technology requires appropriate responses to infrastructure challenges, especially for the most marginalised.
- Context analysis is needed to understand existing or planned policy and interventions, risks and opportunities, and how to respond within EU support programmes.

Digital technology is increasingly playing a role in education and training, whether in the classroom or to enable better management of schools and education systems. In almost every context, we can see examples of small innovations or large-scale programmes using technology in different ways. The real value and impact of this is much debated, and hard evidence remains limited. However, it is generally accepted that technology can present important opportunities, though if not utilised well it can exacerbate inequalities. It is important for us to engage with this, whether in policy dialogue or through interventions, to optimise the educational impact of such reforms.

Under the Sustainable Development Goals (SDGs), there is a broad recognition that technology can potentially play a transformative role in delivering social and economic development and contributing to education quality for all. As part of this, digital skills are seen as vital to operate in the modern world. This is supported by the European Consensus on Development, and the importance placed by the EU on mainstreaming the use of digital technology. A recent Staff Working Document[i] highlights the role of education in developing digital literacy and the need for technology to be an enabler for sustainable development within education.

When considering the role of digital technology to support educational objectives, there are three broad areas for consideration.

- **Technology for teaching and learning:** Where we use technology, it needs to be integrated within a broader process of change in classroom teaching, assessment, or self-directed learning. Otherwise there is a risk that interventions can be technology-driven, focused on provision of devices or connectivity as a solution, without clear educational goals. Interventions or reforms should include three interconnected actions: i) promote the role and improve the capacity of teachers; ii) provide them with necessary teaching and learning materials, and technical support, and iii) ensure and increase their professional development through regular support, peer networks and mentoring. Technology also needs to be aligned to the curriculum, with clarity about how teachers will integrate this into their daily work in class or how students will access appropriate content outside of class (including for personalised learning). Innovative software and digital materials can support what happens in the classroom, not replace it. We are increasingly seeing (mobile) technology enabling new learning opportunities for the most marginalised, including for refugee populations and out-of-school children.
- **Technology for planning and management:** Technology plays a key role in the development of Education Management Information Systems (EMIS), with the aim of providing reliable and timely data for a range of stakeholders, from government to school level. EMIS involves a significant investment in digital technology. However, a well-functioning EMIS should focus primarily on how systems

i European Commission, *Staff Working Document on Digital4Development: mainstreaming digital technologies and services into EU Development Policy*, 2017 https://ec.europa.eu/europeaid/sites/devco/files/swd-digital4development_part1_v3.pdf

and the people within them use data for policy, planning or management decisions. There is an increasing interest in innovative use of mobile technology to enable real time data entry at school or local authority level. This ensures local buy-in and use of data systems and reports, and improved data quality and transfer. Such systems can include basic data on student enrolment, but also on attendance, learning, and school or student funding. Information systems can be built for a broader set of needs, including matching skills training to labour market needs. Mobile and online technology is a powerful tool for assessing citizens' expectations of and satisfaction with public services – including education – providing a vehicle for bottom-up feedback and demand. Technology is also the basis for other innovations in education management, including fund transfer and payment systems, linked to broader developments in mobile banking, which can enable more reliable payment of teacher salaries and student bursaries, and more transparent reporting on school funding.

- **The enabling environment:** The potential to mainstream digital technology is often constrained by electricity supply, connectivity, access to and capacity to use devices. While access has increased globally, this often does not reach the most marginalised communities. This is particularly true in rural or remote areas where there is insufficient economic or political incentive for investment in the required infrastructure. Some initiatives focus on overcoming these constraints, for example through technology with reduced power requirements or that can operate off-grid. The EU plays an important role in National Research and Education Networks (NRENS) which use existing global infrastructure to provide connectivity to universities, research institutions and students. The growing ownership of devices among teachers and students represents an opportunity to mainstream technology, including through the potential role of Bring Your Own Devices policy and practice. Such challenges usually lie outside of the scope of an education ministry, and require partnerships with other ministries and other actors, including the private sector. A key factor is also to understand the total cost of ownership, to ensure investments account for the full range of costs beyond the hardware, including software, training, and maintenance.

2. Key Issues

In most contexts where the EU is supporting education reforms, this growing interest and expansion in the use of technology in education is happening, with or without our engagement. We should aim to ensure this is integrated within education systems in ways that address the specific challenges being faced, while not exacerbating inequalities, and drawing on what we know about good practice. In terms of EU support, this means analysis of the context, finding appropriate ways to respond through policy dialogue or programme support, and ensuring we learn from this to contribute to the evidence base.

Understanding the context

Governments in partner countries have adopted a variety of policies, strategies and programmes that aim to enhance the use of technology in education. These may be driven by the Ministry of Education, or may be led by other authorities, including a Ministry of Information and Communication Technology (ICT). There may be some provision within a sector plan, or a specific ICT in education strategy, and this may link to a broader strategy for the roll out of digitalisation across government. Knowing the content, who is in charge, and assessing the viability of such plans are important a first step.

Contextual question	Issues to consider
What is government policy on digitalisation and where can you find it?	Including e-government or use of ICT in different sectors. Is ICT included in the education sector plan or a specific ICT in education strategy? Are funds allocated?
Who is responsible?	A specific unit or committee may be established within the sector Ministry to promote technology in education, or a separate agency.
What is the reality at school and community level?	Plans are often not matched by reality on the ground (e.g. due to lack of electricity). Data, technical reports, and school visits can help build our understanding of these realities. A review of past ICT projects may help identify potential bottlenecks.
Who is driving technological change in the country?	The roll out of digital technology and connectivity will involve the private sector. Broader national connectivity investments will also matter.

Developing a response strategy

There are various frameworks available to analyse policies in more depth, some of which are included in Section 4 of this note. The following framework provides some questions to guide your thinking about policy and the development of responses in this area.

Dimension	Issues to consider
Teaching & learning	Is there a relevant and clear theory of change for digital technology to promote improved learning? How will technology support pedagogical practice, assessment and on-going teacher professional development? What training and support will ensure teachers can use ICT effectively in class? Which skills and learning outcomes are being targeted? Should technology focus on student self-directed or personalised learning? Is there a focus on curriculum appropriate materials? How will materials be used by teachers in class and/or accessed by students out of class?
Planning & management	What are the needs for sector planning, monitoring and management for which technology can provide solutions? Is technology being used to meet the data needs of users at different levels? Does technology provide schools with tools and data for management that can be used for day to day operations? Is web-based / mobile technology enabling more efficient and transparent payment and financial reporting?
Enabling technology	Will mainstreaming digital technology be facilitated or constrained by enabling factors, and can these factors be addressed or mitigated for? How widespread is digital infrastructure in schools, and how will the needs of the most marginalised be met? Has the proposed intervention been through a rigorous 'total cost of ownership' analysis and is it still good value for money? Is there clarity in roles for government ministries and agencies? Does this include digital safety, child protection and ethics? Is there capacity to maintain ICT after the initial investment? Is there capacity among a range of private sector and other partners to support the financing, innovation, technical implementation and support?

There is a high risk that an investment in digital technology in schools will not be equitable, unless specifically designed to be so. Therefore, in policy dialogue, programme design or in partnership building more generally, this should be at the forefront of discussions. In fact, digitilisation can be an opportunity to address inequality by improving access to electricity especially in remote off-grid areas (e.g. through renewable sources such as solar panels). This could improve learning conditions, beyond the use of digital technology. It is also important to be realistic about the time it will take to achieve change, as well as the scale and longer-term sustainability objectives.

Monitoring and evaluation

When designing a monitoring framework for digital technology reforms, it is important to look beyond the delivery of technology in schools, and to capture some of the outcomes in terms of how this technology is used by teachers within class and the result of this on learning. Technology itself is changing the way monitoring and evaluation takes place, by collecting real time data on learning and attendance, or through the use of technology to conduct assessments and surveys.

3. Case study

Source	Chindavanh Vongsaly, Programme Manager, Education, EU Delegation Lao PDR.
Programme	• The Basic Education quality and access programme (BEQUAL), implemented through a multi-donor trust fund (EU and Australia), under the leadership of the Ministry of Education and Sports (MoES), involving implementing partners (e.g. CSOs). • EU Technical Assistance (TA) support in priority areas of reform and change management such as quality assurance, EMIS and in strengthening capacities in planning and financing of the sector at national and subnational levels.
Context and challenges	The poor quality of teaching is a key priority, among other challenges, being addressed by the Government / MoES through the Laos ESP. Teachers lack the pedagogical skills and content knowledge, and rote learning is commonplace. The MoES aims to develop more student-centred teaching practice. Laos faces a particular challenge in attracting and retaining qualified teachers in remote / ethnic minority areas. The provision of in-service training is extremely limited.
Action taken	Among other priority areas, EU budget support and complementary measures aim to strengthen district level resources and capacity to support teachers, including through the work of district Pedagogical Advisors alongside in-service training for primary teachers. As part of providing in-service training (to primary teachers), the project has developed a two-step cascade approach with Master Trainers and Provincial Trainers, drawn from across the MoES system, at national, sub-national level (provinces, districts, teacher training colleges, primary schools). The most qualified and committed trainers were selected as master trainers and provincial trainers from around 2500 applications.

Action taken *continued*	BEQUAL, including EU complementary support, works with trainers and district Pedagogical Advisors to deliver large scale in-service teacher training with follow up support. During 2019, more than 16,000 primary teachers have been trained on new the new curriculum. The project has used digital technology to support the work, with 4 WhatsApp groups set up to provide feedback and support to the trainers. Provincial trainers are encouraged to post their questions on the WhatsApp group, and get support and answers from the Master trainers, teacher specialists and also from their peers/provincial trainers. Anecdotally, it is understood that teachers also set up WhatsApp groups locally to share experience and materials with each other. Trainers use their own phones and most of the districts/villages in which they live and work have good, affordable connections via the national 3G network. The groups have received support from TA funded under EU BEQUAL. Two national teacher education experts are in the groups to provide some advice in response to questions. However, the focus of the forum is to encourage peer support and exchanges. All training materials, teaching and learning aids (e.g. on PowerPoint, videos, posters, story books) can be downloaded through scanning a QR code. A communications expert has helped to upload materials for sharing.
Impact	It is too early to report impact, though an evaluation of this support is planned in November/December 2019
Lessons learned	This represents a use of appropriate and readily available digital technology within a teacher training programme, in this case as part of training of trainers. This did not need any significant investment, and participants were already familiar with the technology. The use of WhatsApp in this way (and potentially other social media) enables communication between trainers and trainees, supervisors / Pedagogical Advisers, and between peers. It allows trainees to post their questions and receive answers and practical, task focused support and advice in real time, even where they are distant and working in remote areas.

4. References and Further Reading

While there is limited evidence about the impact of technology on learning, and the specific ways this can be done at scale within an education system, there is a growing body of useful resources that can inform our work. These include:

British Educational Communications and Technology Agency (BECTA), *Managing ICT costs in schools.* Coventry: Becta, 2016. A research study from BECTA that provides an approach to engaging with 'total cost of ownership' of technology in education. https://core.ac.uk/download/pdf/4151914.pdf

Comprehensive Initiative on Technology Evaluation (CITE), *A framework for evaluating appropriateness of educational technology use in global development programs, 2018.* A practical framework developed by MIT for assessing education technology interventions. http://ceisip.mit.edu/system/files/reports/Summary%20Report_A%20Framework%20for%20Evaluating%20Appropriateness%20of%20Educational%20Technology%20Use%20in%20Global%20Development%20Programs.pdf

Education Technology (EdTech) Hub. A research hub launched in June 2019. It aims to create the largest global body of research that looks at how education technology is being used and how this can be improved. Currently the resources available are limited but the Hub will be a resource to watch as evidence is produced https://www.edtechhub.org/

European Framework for Digitally Competent Educational Organisations (DigCompOrg). A tool/framework developed by EU Joint Research Centre (JRC) for education institutions and policy makers to reflect on integration of digital learning technologies. https://ec.europa.eu/jrc/en/digcomporg/framework

European Training Foundation, **Digital skills and competence, and digital and online learning,** 2018. A paper providing an overview of EU relevant policies and tools, and ETF approach in partner countries https://www.etf.europa.eu/en/publications-and-resources/publications/digital-skills-and-competence-and-digital-and-online

Inter-agency Network for Education in Emergencies (INEE)'s ICT Inventory for Education in Emergencies. An onlineinventory of how technology is being used for education in emergencies. http://ict.ineesite.org

Trucano, M. *SABER-ICT Framework Paper for Policy Analysis: Documenting national educational technology policies around the world and their evolution over time.* World Bank Education,Technology & Innovation: SABER-ICT Technical Paper Series No: 1, Washington, DC: The World Bank, 2016 http://wbgfiles.worldbank.org/documents/hdn/ed/saber/supporting_doc/Background/ICT/112899-WP-SABER-ICTframework-SABER-ICTno01.pdf

World Bank EduTech Blog. A useful resource with up to date ideas, field experience and research on the topic. https://blogs.worldbank.org/edutech.

DEVCO has developed a Discussion Paper on *Digital4Development: mainstreaming digital technologies into EU support to quality education,* in which the issues and framework presented in this guidance note are elaborated in more depth.