# ANALYTICAL TOOL: ICTs in education

## 1. Introduction

Information and communication technologies (ICTs) have opened up endless possibilities of access to information and knowledge, and have become a powerful tool in the hands of learners and educators around the world.

Appropriate and effective application of state-of-the-art ICTs can bring a lot of benefits to education related practically to all fields of learning and teaching **activities** including efficient social interaction between teachers, students and parents, as well as to the administration and management procedures having a positive impact on the quality of education on the whole.

Both learning and teaching are qualitatively different with regard to the use of advanced ICTs. The education process becomes significantly richer when students have access to new types of information and knowledge, and when they can complete experiments and manipulate virtual labs in ways never before possible, as well as share their learning experience, results and conclusions through social media with their classmates, their teachers, and other students practically around the world.

This Analytical Tool has been developed to support the analysis and determine the potential of ICTs in general education for raising the quality and equity of general education and for promoting access to education for all.

**The paramount question which this Analytical Tool aims to address is: Does the country have relevant vision and adequate implementation mechanisms to raise the quality, equity and accessibility of general education by means of ICTs?**

## 2. Diagnosis and analysis

# Understanding ICTs from education perspective

1. What is our vision of ICTs in education? How is this vision articulated and shared? How does this vision correlate to the national development plan? Does our national educational strategy reflect ICTs in education vision?
2. In what ways do ICTs impact the development and quality improvement of general education? How does the vision of ICTs in education consider socio-economic and geo-political factors of access to education by means of ICTs?
3. How does the vision take into account the level of the ICT infrastructure development in the country, the availability of unified ICT-based information-educational environment, the approaches to curriculum development and the diversity of educational settings, and the ICT competencies of teachers and learners, and educational staff?

# Policy development and implementation strategies on ICTs in education

1. What are the existing policies, strategies and programmes of ICTs in general education? [**Technical note 1**] What is the scope of that impact – purchasing of equipment, ICT integration into curriculum, ICT teacher training, Open Educational Resources (OER) and/or Open Courseware (OCW) development, etc.? [**Technical note 2**].
2. Are there any kinds of national standards of teacher ICT competencies and/or competency-based national system of teacher professional development in the country? (If any, please provide appropriated examples.)
3. Are there any standards of learner ICTs competencies and/or competency-based national systems of ICT skills/competencies assessment for learners at different levels of general education? (If any, please, provide appropriated examples.) What is the evidence that they are effective? How do we sustainably monitor the results?
4. Has the country got guidelines/recommendations on the application of any kind of standard learning environment, Learning Management System (LMS), Learning Content Management System (LCMS) and Content creation tools in general education?
5. What are the barriers for ICT incorporation into education policies and strategies? What challenges can prevent effective execution of such initiatives (absence of clarity, lack of implementation strategy and/or monitoring procedures, etc.)?

**Access and utilization of ICTs in education**

1. What is the extent of access to national and global information-educational resources including OER and OCW, virtual laboratories and/or digitized collections of content units in the country? (If any, please, provide appropriated examples.)Are teachers and/or school administrators connected to communities of practice (if the latter exist)? Are social media used in teaching/learning processes in general education? Is there any kind of ICT-based learning performance assessment/evaluation tools and techniques to be used in general education in the framework of the national System Assessment and Benchmarking for Education Results (if appropriate)? Does the country have education and ICT statistics including indicators and data on computer equipment and communications in rural and urban educational institutions? What is the Internet access coverage in the educational institutions across the country? Is the national statistics based on the internationally agreed benchmarks and indicators of ICTs application developed by UN agencies?

3. Is ICT and/or information literacy training integrated into the general education curriculum? What are the challenges of ICT incorporation into the existing curriculum? What modifications in the curriculum design should be applied for more effective ICT application?

4. What data is available about the level of ICT literacy and/or ICT competency among the teachers in our country? How do the teachers (and learners) use ICTs for: (a) supporting the learning process for pupils; (b) preparing lessons; (c) developing self-competencies, etc.? How were their ICT competencies built? Do the pedagogical institutions have educational programmes aimed at raising teachers’ ICT competencies? Are there any regular workshops and trainings in our country to raise awareness and skills for teachers (and for learners) in using ICTs in education? Do the web-based professional networks of general education teachers as well as specialized social networks for learners exist in the country?

5. What current interventions on ICTs in education have the most obvious impact on general education system? What is the nature of that impact and where is the evidence of the impact? Is there any kind of common approach to individualization/personalization of learning process based on ICTs in the country? What mechanisms do we have for analyzing the effectiveness of ICT application in general education? Who evaluates the effectiveness of ICT integration in education? Who are the involved stakeholders? How are internationally agreed indicators and benchmarks utilized in our evaluation of ICT application in education? Once identified, what remedial actions do we employ? Where is the evidence of the impact?

6. Based on your analysis of all of the above questions, what are the major challenges and obstacles which prevent effective integration of ICTs in education? Is there evidence that we regularly monitor and assess the effectiveness of the state programmes on ICT-mediated teaching and learning? Whether the results of monitoring and assessment improve our financial planning?

7. What mechanism was set to define the financial needs to gain the national educational strategy in terms of ICT-mediated teaching and learning? What are the effectiveness criteria of the budget implementation? Which areas of education are covered in the financial planning documents and approved budgets?

8. Does my country funds development of its own or localization of existing international ICT-based educational programs and resources for teachers and/or learners on your regional (national) languages?

**3. Priorities for action**

1. What particular strengths do we have to achieve our goals on ICT integration in general education? What are the problem areas hindering effective integration?

2. What are the changes we need to consider to further improve the implications of ICT integration in education?

3. What are the gaps needed to be bridged for an evidence-based policy and strategy to improve ICT application in our schools to achieve the goal of quality and accessible education for all?

4. What, in your opinion, should be the priority steps for our country to overcome the existing challenges and implement the potential of ICTs in general education for raising the quality and equity of general education for all?

**Technical note 1.**

ICT policy in education refers to the collection of laws and rules that govern the process of ICT application in the education. As usual the policy covers 3 major areas – IT infrastructure in education (hard- and software, global communications and the Internet); ICT integration into curriculum (methodologies, learning design, e-resources); ICT competencies of teaching staff and education administrators. Policy and planning issues are available at the at UNESCO Sector of Education <http://www.unesco.org/new/en/education/themes/planning-and-managing-education/policy-and-planning/>

**Technical note 2.**

Open Educational Resources - ‘*materials offered freely and openly to use and adapt for teaching, learning, development and research’*. While OER are mainly shareable in digital formats (both online and via offline formats such as DVD or CD-ROM), OER not just synonymous with online resources, online learning or e-learning, and within the development context, OER can also be in printable formats. The term Open Courseware is used for *publicly available materials that are either a part of, or a complete course from an educational institution such as a university or college* [http://www.col.org/resources/crsMaterials/Pages/OCW-OER.aspx].Two other most widely accepted definitions of OER that encompass adaptation and re-purposing are the following: *“Open Educational Resources are teaching, learning or research materials that are in the public domain or released with an intellectual property license that allows for free use, adaptation, and distribution.”* [<http://www.sourceoecd.org/education/9789264031746> ] and “*OER are teaching, learning and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials or techniques used to support access to knowledge*.” [<http://www.oerderves.org/wp-content/uploads/2007/03/a-review-of-the-open-educational-resources-oer-movement_final.pdf>]