



#0 Policy Paper on Information and Communication Technology in Education (ICTE)

The Palestinian Authority with support from the Belgian Development Cooperation implemented from 2011 till 2015 the project "E-learning Curriculum in Primary and Secondary Education" in several hundred Palestinian schools. The aim of the project was to utilize ICTs in school education in order to enhance student-centred learning and stimulate 21st Century Skills in Palestine.

An Intervention Action Research was conducted in 2014-15 with the main aim to provide upstream policy advice to the Ministry of Education and Higher Education towards improving and advancing E-learning resources and practices for teachers, students and families. The Action Research was assigned to a consortium of the Open University of Cyprus and the Al-Quds Open University which produced the following Policy Papers:

0. Policy Paper on Information and Communication Technology in Education (ICTE)

1. Policy Paper on School-led Initiatives (SLI)
2. Policy Paper on Digital Educational Resources (DER)
3. Policy Paper on mobile Learning (m-L)
4. Policy Paper on Teacher Professional Learning (TPL)
5. Policy Paper on 21st Century Skills (21CS)

The policy papers are based on a "Most Significant Change" study from over a hundred school communities (teachers, students, headmasters, parents, administrators) that participated in the e-Learning project, on two 4-month long Action Research projects in two sets of ten schools, on extensive discussions and feedback from supervisors and MoEHE staff, and detailed review by the staff from the Belgian Development Agency. A two-day seminar was held by MoEHE in April 2015 in Jericho in which initial versions of the papers were presented and reviewed by policy makers and practitioners. Thus, although the authors of the papers have full responsibility, they cannot take full credit. In December 2015 the results were presented and discussed publicly in Ramallah.

Each policy paper includes a subject definition, followed by objectives of the policy under discussion, continuing with policy issues, questions and decisions to be made; related challenges, risks and opportunities are outlined and the relation to the curriculum is highlighted, concluding with Policy Recommendations. The main detailed part is prefaced by a single-page outline.

The purpose of the six policy papers, to be used in combination, is to provide policy advice to the Palestinian Ministry of Education and Higher Education given its strategy, as specifically expressed:

- "the shift from teacher to student-centred learning, considering that frontal teaching, lecturing and rote learning are still the predominant methods of teaching in Palestine" (cf. MoEHE, 2008a, 34; MoEHE, 2008b, 8; PEI, 2009, 14)
- "... that ICT in education plays an important role as an enabler for promoting pedagogical innovation and developing the quality of teaching and learning. ... ICT may be an effective tool for learning or part of a learning environment designed to achieve specific learning objectives, often not related to ICT content" (Strategic framework of the Palestinian Education Initiative)
- "... special focus on quality improvement in learning environments and students acquiring the so called 21th Century skills" (ToR of the Action Research)

This series of Policy Papers was produced in 2015 by a team of educators from the Open University of Cyprus, Al-Quds Open University, the Belgian Development Agency (BTC) and the Ministry of Education and Higher Education of Palestine coordinated by Thanasis Hadzilacos, Professor of Educational Technology at the Open University of Cyprus.

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"Technology can amplify great teaching but cannot replace poor teaching. Not a magic bullet to improve learning, it can play a role if applied better in the classroom; of little help in bridging the skills divide between advantaged and disadvantaged."

(From the OECD study, 2015)

The opinions expressed in this document represent the authors' points of view which are not necessarily shared by the Belgian Development Agency (BTC) or by the authorities of the countries concerned.

They include comments by the Palestinian colleagues from MoEHE and QOU after the Jericho meeting, April 2015. At all our visits we experienced a warm welcome from the people involved in supporting the educational process at primary and secondary schools in Palestine.

Overall Issues: Goals for ICT@E, Innovation, Infrastructure, Digital Educational Resources, Coordination, Teacher Professional Development

This page outlines the main recommendations for ICT in Palestinian school education, including objectives, related policy issues, challenges and opportunities.

If Education was a chemical reaction, ICT@E would be the catalyst.

Objectives for the policy on ICT utilization for education (ICT@E)

1. For students: to take an active role in their learning and acquire 21st century skills.
2. For teachers: to innovate, to feel comfortable and take an active role in utilizing ICT.
3. For MoEHE: to advance its strategy for 21st century skill student-centred learning.
4. For Palestine: Utilize ICT@E as an opportunity to reform school education including the curriculum in the direction of active student-centred learning and 21CS.

Policy Issues/Questions that must be decided upon

- PR 1. Goals for teaching and learning ICT in schools
- PR 2. New MoEHE structure for dealing with ICT@E
- PR 3. Policy for teacher skills and motivation to produce, design, use, adapt and adopt ICT@E
- PR 4. Policy for infrastructure and technological developments, including budget allocation
- PR 5. Policy for quality, innovation and flexibility for ICT@E in relation to the curriculum
- PR 6. Policy for Internet safety for students and good usage by all

Related Challenges, Risks and Opportunities

- C1. Establish a long-term strategy, corresponding policies and far-reaching actions.
- C2. Coordinate the various MoEHE departments and activities affected by ICT@E through a new structure.
- C3. Coordinate deployment of ICT@E: teacher Education, infrastructure deployment, digital educational resource production and curriculum reform

Policy recommendations (More details in the five specific Policy Papers)

- PR 1. Expectations should be long-term, with a corresponding strategy and policies.
- PR 2. Ensure coordination: with curriculum, by all MoEHE departments, for school ICT deployment.
- PR 3. Establish the Palestinian Institute for ICT in School Education.
- PR 4. Divide long-term budget equally among infrastructure, teacher education (TPL), digital resources (DER) and school initiatives (SLI).
- PR 5. Implement in stages, with school as the unit of transformation.
- PR 6. Utilize ICT for teacher professional learning just as teachers will utilize ICT for their students.
- PR 7. Strategy for DER development by teachers: "Recognize, Reward and Request".
- PR 8. Upgrade, integrate and use the MoEHE portal(s).

Overall Issues: Goals for ICT@E, Innovation, Infrastructure, Digital Educational Resources, Coordination, Teacher Professional Development

This paper presents policy recommendations for ICT in Palestinian school education (ICT@E). It concludes the series of 5 policy papers on SLI, DER, m-L, TPL and 21CS and is best read along with them. It includes objectives, policy issues for MoEHE, challenges and risks present, and opportunities available. Several of the policy recommendations for ICT@E have a more general dimension:

- TPL (Teacher Professional Learning) for ICT@E is closely related to TPL in general; several policy issues for TPL are not exclusive to ICT.
- DER (Digital Educational Resources) policy is related to general educational resources policy, including textbooks.
- SLI (School-led Initiatives) is related also to non-ICT related school initiatives.
- m-learning is related (a) to the overall ICT infrastructure policy and (b) to informal and out-of-school learning including the use of students' own devices.
- 21CS (21st Century Skills) can and should be cultivated independent of ICT, as well as with ICT.
- Policy on ICT infrastructure is related to policy on all technological and other school infrastructures.

If Education was a chemical reaction, ICT@E would be the catalyst.

O - Objectives for the policy on ICT utilization for education (ICT@E)

1. For students: to take an active role in their learning and acquire 21st century skills (21CS), including but not restricted to information literacy and digital skills. In other words, the main reason why we use computers at school, is not to learn about computers.
2. For teachers: (a) to innovate, and (b) to feel comfortable with ICT and (c) to take an active role in utilizing ICT in schools. ICT offers many opportunities to teachers for innovation (which is a goal in itself independent of ICT), whereas just using of ICT should not be a policy goal. MoEHE policies should make teachers feel comfortable in utilizing ICT by providing support, encouragement and space in the curriculum. Finally policies should make teachers take an active role in ICT utilization towards 21st Century Skill (21CS) development, mainly by applying the "recognise, reward and request" strategy.
3. For MoEHE: to advance its strategy for 21st century skill student-centred learning. This includes educating not only teachers but also school principals, supervisors and MoEHE personnel.
4. For Palestine: Utilize ICT@E as an opportunity to reform Education including the school curriculum. Although ICT will not by itself solve the problems Palestinian education is facing, and although ICT is pedagogically neutral since it can be used to serve any pedagogical model, it does constitute an opportunity for reform in the direction of active student-centred learning and 21CS.

PI - Policy Issues/Questions that must be decided upon

- PR 1. Goals for teaching and learning ICT in schools. The main policy issue regarding teaching and learning ICT in education is its goals and scope. ICT in education is certainly not confined to learning about and using ICT. There are several options, some aspects of which can be combined:

- Teaching computer science (informatics) as a subject; it can be separately taught or combined with mathematics or technology.
- ICT as a tool for assisting learning goals of all subjects ("ICT across the curriculum")
- Information (media) literacy¹, one of the 21CS, as a transversal learning goal in all subjects.
- ICT as a tool for developing 21CS (including Information Literacy)

The easy answer "all of the above" is not a policy, it is a wish list. A policy must have a focus, set priorities and make difficult choices. For example, using school labs for teaching informatics as a subject, severely limits the possibility for non-technology teachers to use ICT if these labs are the only school resource.

- PR 2. New MoEHE structure for dealing with ICT@E. MoEHE policy for ICT@E is reflected in the structures established for its promotion and support: ICT@E and 21CS are both horizontal; they transverse classic educational and administrative divisions. ICT@E is not the exclusive province of technology or computer science teachers. 21CS cannot be assigned to a single MoEHE department. This is not an easy managerial challenge to resolve and has been dealt with in different ways in different countries and different times, not always satisfactorily.
- PR 3. Policy is needed for developing skills and motivation of teachers to adopt, utilize, adapt, design, and produce ICT@E. Specific recommendations are included in the 4th Policy Paper on Teacher Professional Learning (TPL).
- PR 4. Policy for ICT infrastructure and new technological developments, including m-learning. Questions of budget allocation, infrastructure renewal, distribution must be answered.
- PR 5. Policy for quality, innovation and flexibility in school education is a more general issue, which is particularly relevant to ICT. Since ICT will be used for innovation and quality, more flexibility must be given to teachers utilizing ICT than is usually prescribed by the curriculum.
- PR 6. Policy for Internet safety for students and good usage by all is an issue related to ethical ways of living, itself a 21st Century Skill.

C - Related Challenges, Risks and Opportunities

- C1. Long term strategy
Simply 'introducing' ICT in schools is relatively easy; utilizing ICT for 21CS and student-centred learning is very difficult and very long term. Unless expectations are set accordingly, disappointment will follow very soon after the initial enthusiasm. There is a need for a long-term strategy, corresponding policies and far-reaching actions.
- C2. MoEHE Department Coordination
Coordinate the various MoEHE activities related to and departments affected by ICT@E through a new structure. A fundamental challenge for all ministries of education is that tasks of various departments (Planning, Supervision, Curriculum, NITT, etc.) are strongly and complexly interrelated; this is even more acute for ICT utilization. Both ICT@E and 21CS affect curriculum, planning, supervisors, training, assessment, budget, even physical classroom and school design
- C3. ICT Deployment coordination
Coordinate deployment of ICT@E: teacher Education, infrastructure deployment, digital educational resource production and curriculum reform. There is a cyclical relationship: infrastructure will remain unused and soon useless without educated teachers, DER available and reformed curriculum. But also educated teachers who return to schools without infrastructure will soon forget and become disheartened; DER cannot be developed by inexperienced teachers, but experience comes from utilization. To break the circle we need a spiral, staged approach (see below). This must be the task of a new administrative structure ("Palestinian Institute for Educational Technology", see below.)

¹ Information literacy is not the same as digital literacy. Information literacy is a skill existing before and without ICT. ICT adds new dimensions to and poses new requirements from this skill.

PR - Policy recommendations

The first two recommendations are general policy directives. The other six are specific policies. More detailed policy recommendations are given in the five specific Policy Papers.

PR 1. **Expectations should be long-term, with corresponding strategy and policies.**

This very long-term issue requires a long-term approach, which means, among others:

- There will be differences among schools at any point in time; it is particularly difficult to keep the schools in Gaza with the same infrastructure.
- The educational benefits from ICT utilisation are not immediately visible; teachers should be prepared for that and all expectations should be set accordingly.
- People in positions of authority will change and with them views, priorities, policies and implementation decisions will change.
- Funding will not remain constant and it will never be enough.
- Enthusiasm will evaporate.
- Technology will keep evolving and schools will never have the 'latest' and will always need/want more.
- Although the long-term goal (i.e. 21st century skills) will remain for a long time, the practical means for achieving it will keep changing.
- Internet in all schools can be unreliable; in an occupied country it is even more so.
- A 'permanent' structure is needed in MoEHE, centrally and regionally.

PR 2. **Ensure coordination: with curriculum, from all departments, for school deployment.**

Because ICT@E is transversal, its utilization must be coordinated from several points of view. Because ICT@E utilisation will be gradual, the need for coordination will be permanent. Very important is the Relation and Coordination with the Curriculum.

ICT@E:

- Should serve the curriculum -not the other way around. However if ICT@E just serves the existing curriculum, the goals of active learning and 21st Century Skills will not be achieved.
- Must be integrated in the curriculum -not just constitute extra-curricular activities.
- Is an opportunity to reform the curriculum and the whole educational system: not in order to follow the technology, but because technology allows us to do what we already wanted, and could not do in the large scale with the means we had available.

Therefore:

- Design learning activities to serve the curriculum but not to mimic its implementation. (see DER paper)
- Take advantage of ICT to reform the curriculum in the direction of 21st C skills (not in the direction of ICT)
- Justify ICT@E investments (money-effort) educationally, not technologically.

PR 3. **Establish the Palestinian Institute for ICT in School Education.**

New administrative and scientific structure

ICT@E requires an administrative, educational and scientific structure by the Ministry. Several solutions exist; none has only advantages; they can be categorized in the following types:

- Type 1: Assign the task to one of the existing departments (with the assistance of others).
- Type 2: Assign the task to a "task force" from various departments.
- Type 3: Create a new unit (department, institute or office).

Type	Advantages	Problems
1 Existing	An experienced, functioning unit undertakes the task.	Imbalance is created among departments as the one selected acquires more power; other departments are not willing to assist; they assign junior personnel and do not give priority to the task <ul style="list-style-type: none"> The department selected does not really have the know-how; they submit the new to the old; their priorities remain where they used to be; internally the department has the same problem, namely that they must select one of the three solution types for their sub-units.
2 Task Force	Know-how of all types comes into the issue, as needed. The managerial structure corresponds to the horizontal (transversal) nature of the task.	<ul style="list-style-type: none"> It is nobody's priority or responsibility; when things get tough or failures occur the "collective responsibility" translates into no action No department assigns their best people; not executive team is formed, only a counselling one
3 New	<p>New Institute (semi-independent): Good for the scientific part; weaker for the managerial/ administrative part.</p> <p>New Office (small, very strong, with budget and political power)</p>	<p>New Department: weak</p> <p>Additional cost for the new structure</p>

Conclusion: No solution is clearly the best. No solution is guaranteed to work. A lot depends on persons and personalities. We suggest the following combination:

- A new Institute for Educational Technology (ICT@E) with liaison with the various departments and Palestinian Universities.
- An office for the 21st CS with budget, strong director, directly reporting to the minister or deputy minister, and minimal but select personnel.
- An advisory committee with people from all involved departments but acting in their personal capacity (not representatives), who cannot be replaced in meetings, must attend all meetings.

The Palestinian Institute for ICT in Education must develop and maintain a detailed policy for ICT infrastructure. The policy will of course need updating as time goes by and persons change, but it should not be reversed. This policy should deal with the following:

General questions

- What administrative, monitoring, decision-making structure is needed in MoEHE, Directorates, and Schools in order to serve the objectives.
- Decentralization level: Central (MoEHE), Middle (Directorate) or Distributed (School) decision making?
- How to connect with the curriculum and how to reform the curriculum?
- How to distribute resources among schools (Equally? Per school? Per student? Per teacher? Only if it can reach all schools? Gradually? Let schools decide?)
- How to cope with new technological developments?

General objectives

- Building a positive and well-aimed culture in schools
- Extending the reach of the school to the whole community
- Connecting the schools with community, university, industry, international

In drafting the detailed policy it is important to understand what is special about Palestinian education and how does it affect ICT@E utilization? This includes the following:

- Geography and climate
- Occupation
- Level of economic development
- Religion (e.g. Separate Boys-Girls schools)
- Young population (including young teachers)
- Other?

PR 4. Divide long-term budget equally among infrastructure, teacher education (TPL), digital resources (DER) and school initiatives (SLI).

A Long-term Budget policy must answer the question “How much to spend on each aspect?” A typical balanced ICT@E budget would spend 10-20% on SLI, about 25% on DER, 20-30% on TPL, 20-30% on infrastructure including m-learning and networks, and 10-20% on others.

The international community will always be very glad to finance good plans for ICT@E for 21CS. Technology in schools is an opportunity to get new donors involved.

PR 5. Implement in stages, with school as the unit of transformation.

International experience including the specific Palestinian experience shows that integrating ICT in mainstream school education is difficult, expensive, takes a very long time, and is laden with mistakes and dead ends. These difficulties increase when ICT@E has 21st CS as the goal. We need to take up the objectives in stages and treat the whole project as a long-term goal in the order of a generation (20-25 years).

Innovations in societies are adopted in phases; a well-known model for innovation adoption is the Roger’s curve². We can expect a similar curve in the adoption of ICT@E in Palestinian education. The Palestinian educational system is centralized; it can “decide and command” the acceptance of the innovation.

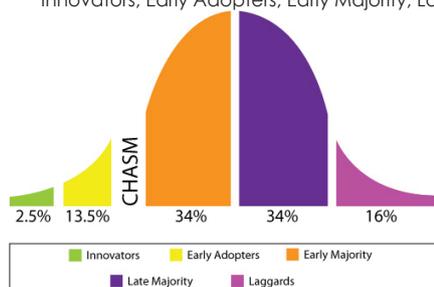
In this case resistance to change does not disappear: it will often take the form of incorrect use and not direct refusal to use; but incorrect use is more difficult to spot and correct.

Important objectives of the suggested policies are to minimize:

- The time of the chasm between early adopters of educational technology and early majority.
- The duration (horizontal axis) of each phase and especially the duration of the two ‘majorities’, the early and the late.

Adoption of ICT@E in a school can be seen as 4 innovative stages, in which each school moves from the Initial stage to the e-Enabled, then to e-Confident and finally to e-Mature stage³.

2 This is shown in the curve below which depicts 5 groups of people: Innovators, Early Adopters, Early Majority, Late Majority and Laggards.



3 The e-Learning Roadmap from the Irish National Center for Technology in Education provides a number of statements under the headings: Leadership & Planning, ICT & the Curriculum, Professional Development, e-Learning Culture and ICT Infrastructure, categorised as: Initial; e-Enabled; e-Confident & e-Mature. <http://www.pdsttechnologyineducation.ie/en/Planning/e-Learning-Roadmap#sthash.YUJ1wJGM.dpuf>

We would like to see all Palestinian schools to be e-mature. We shall not live to see this –it has not happened in any country yet⁴. What are the intermediate stages? Taking into account the four stages and the innovation adoption model and assuming 5 years as the duration for each group to adopt the innovation we can look at the map of innovation adoption by schools, for the 4 stages every five years⁵:

	Initial	Enabled	Confident	Mature
2010	2%			
2015	14%	2%		
2020	34%	14%	2%	
2025	34%	34%	14%	2%
2030	16%	34%	34%	14%
2035		16%	34%	34%
2040			16%	34%
2045				16%

Use the school as the unit of transformation

- not the individual teacher: she will be the “lonely rider”, she will get tired; she will be ridiculed; she will not be effective in transforming student learning;
- not the whole school system at once; it is too big, it has too much inertia and will not happen.
- A school has the most effect in society: People will say “this is a good school to send our children to”.
- A school is a most visible unit.
- Schools as units of transformation can be the object of a MoEHE policy (a policy to decide which schools) whereas individual teachers cannot be the object of a MoEHE policy.

Stages depend on

- Leadership and Planning
- ICT in the curriculum: utilisation (of infrastructure, DER, ...) in and beyond school measured by
 - What % of students does what
 - What % of teachers does what
- Professional development
- DER availability and e-Learning culture
- Infrastructure availability

PR 6. Utilize ICT for teacher Education just as teachers will utilize ICT for their students.

Utilize ICT for all teacher professional development just as teachers will utilize ICT for their students. If successful (it is not easy) this will cultivate active learning and 21st Century Skills for teachers themselves, who will then be in a better position to apply those to their students. (More details in the TPL paper.)

PR 7. Strategy for Teacher DER development: “Recognize, Reward and Request”

Motivate, encourage, and give incentives to teachers for their Professional Learning in ICT@E and its utilization in school through a strategy “Recognize, Reward and Request” that will coordinate MoEHE departments and cover from teacher needs to professional learning to application in school:

- Recognize, support, and acknowledge the work needed and often done in ICT@E by innovative teachers and schools.
- Reward through distinctions, promotions, scholarships, educational leaves, priority in school choice and other means.
- Request and Demand through a plan that will require each teacher to take up a certain amount of ‘learning units’ from among those offered by universities and other centres and accredited by the Ministry according to an approved personal plan for each teacher.

4 See “Students, Computers and Learning: making the Connection” (OECD, 2015)

5 It does not really matter if we accept this or another model, so long as a specific one is adopted.

PR 8. Upgrade, integrate and use the MoEHE portal(s).

Web 2.0 with its online learning communities and user content is an excellent opportunity for teachers to become involved in the MoEHE strategy for ICT in Education. If the digital services provided (portal) by MoEHE are good, they will be used by the educational community; if not, teachers will use other social media. Trying to control Cyberspace does not work, as governments from China to US and from Russia to Turkey have learnt; the Ministry cannot force the use of MoEHE portals.

The International Experience

The International experience clearly shows how difficult and long-term the correct utilization of ICT@E is. Here follow three short excerpts from the EU, OECD and Harvard University:

Teachers still believe that insufficient ICT equipment is the biggest obstacle to ICT use in many countries. Whilst teachers are using ICT for preparing classes, ICT use in the classroom for learning is infrequent. Teacher training in ICT is rarely compulsory and most teachers devote spare time to private study. Students and teachers have the highest use of ICT and ICT learning-based activities when schools combine policies on ICT integration in teaching and learning. However, most schools don't have such an overarching policy. Therefore it is not surprising that teachers generally believe that there is a need for radical change to take place for ICT to be fully exploited in teaching and learning.⁶

Investing heavily in school computers and classroom technology does not improve pupils' performance. ... frequent use of computers in schools is more likely to be associated with lower results. ... School technology had raised "too many false hopes" ... teachers had been "dazzled" by school computers. The report from OECD examines the impact of school technology on international test results: ... education systems which have invested heavily in ICT have seen "no noticeable improvement" in Pisa test results for reading, mathematics or science.⁷

Even our "best" schools are failing to prepare students for 21st-century careers and citizenship. ... Across the United States, I see schools that are succeeding at making adequate yearly progress but failing our students. Increasingly, there is only one curriculum: test prep. Of the hundreds of classes that I've observed in recent years, fewer than 1 in 20 were engaged in instruction designed to teach students to think instead of merely drilling for the test.⁸

6 Conclusions from <https://ec.europa.eu/digital-agenda/en/survey-schools-ict-education> (This study collected and benchmarked information from 31 European countries (EU27, HR, ICE, NO and TR) on the access, use, competence and attitudes of students and teachers regarding ICT in schools.)

7 <http://www.bbc.co.uk/news/business-34174796> (OECD, 2015)

8 <http://www.tonywagner.com/244> Tony Wagner is Co-director of the Change Leadership Group at the Harvard Graduate School of Education.