

Twenty-first Century Educational Skills for Development in the Mediterranean: Quality and Curriculum Relevance

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Relationships between Europe and southern and eastern Mediterranean countries were formalised in 1995 through the Barcelona agreement, even though relations between specific European and Mediterranean countries have been going on for hundreds of years. The fact that the Mediterranean is of economic, cultural, political, and security importance for Europe led to a major initiative, the Euro-Mediterranean Partnership, to encourage cooperation between Europe and a number of southern and eastern Mediterranean countries. The Euro-Mediterranean Conference of Ministers of Foreign Affairs, held in Barcelona on 27-28 November 1995, signified a starting point of the Partnership that represented a framework for political, economic, and social relations between the member states of the European Union and partners of the southern and eastern Mediterranean countries. In 2006, the Partnership comprised thirty-five members, twenty-five European Union member states and ten Mediterranean partners (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestinian Authority, Syria, Tunisia and Turkey) with Libya having an observer status since 1999. The Euromed partners established the following three main objectives of the Partnership in the Barcelona Declaration: 1) the definition of a common area of peace and stability through the reinforcement of political and security dialogue; 2) the construction of a zone of shared prosperity through an economic and financial partnership and the gradual establishment of a free-trade area; and 3)

rapprochement among peoples through a social, cultural and human partnership aimed at encouraging understanding between cultures and exchanges between civil societies.

What is of concern in this paper is the partnership's emphasis on social, cultural, and human affairs and more specifically on developing human resources. Statements in the Partnership declaration accentuate the readiness of European countries to contribute to enhancing education throughout the Mediterranean region, with special attention to Mediterranean partners, by establishing a system for ongoing dialogue on educational policies with a focus on vocational training, technology in education, higher education and research, with particular attention to the role of women in education. Leaders of the Euro-Mediterranean Partnership renewed their commitment to the objectives of the Barcelona Declaration in a meeting held in Barcelona on the 27th and 28th of November 2005. In what concerns education, they pledged to support educational reform, projects to increase gender equity and create a skilled workforce¹.

At the dawn of the twenty-first century, how can the Euro-Mediterranean Partnership contribute to improving access, quality, and relevance of education in the Euromed region? To answer this question, the status of education in the Euromed region will be described in an attempt to identify the current challenges facing education in the region. Following this description, suggestions will be provided to address these challenges in a manner that has the potential to benefit the peoples of the southern and eastern Mediterranean and of Europe by increasing quality and relevance of education.

¹ See http://ue.eu.int/ueDocs/cms_Data/docs/pressdata/en/er/87165.pdf

Status of Education in the Euromed Region

Southern and eastern Mediterranean² countries have seen a notable increase in access to education at the primary level in the past two decades³. The same can be said about access to secondary education, albeit with some caution, because of variability among countries in the region. For example, while the net enrolment rate⁴ at the secondary level in Jordan was 82% in 2004, that of Morocco was 35%, with net enrolment in other countries lying in between these two countries. The most serious problem seems to be at the pre-school level in which the net enrolment rate is relatively low in this region, with the highest net enrolment rate being in Lebanon (72%) and net enrolment rates in other countries ranging from 5% to 46% (Table 18). This situation is coupled with relatively high student/teacher ratios in these countries (except for Lebanon). When compared to a selected number of European countries, specifically those bordering the Mediterranean, the southern and eastern Mediterranean countries seem to lag behind in net enrolment rates at the pre-primary and secondary levels (Table 18) and at all levels in student/teacher ratios.

Quality of education and the gender gap remain problems in the southern and eastern Mediterranean countries⁵ even though there was some improvement in both recently (United Nations Development Programme/Regional Bureau for Arab States (UNDP/RBAS) 2002, 2003, 2005, 2006). Quality of education in a number of southern and eastern Mediterranean countries can be gleaned from the results of the 2003 PISA and TIMSS results. These results indicate that Turkey and Tunisia, two partners in the Euro-Mediterranean Partnership, scored low compared to European countries on the science and math literacy and problem-solving components of the 2003 PISA (Table 19). Moreover students in the Palestinian territories, Egypt, Tunisia, Morocco, Jordan and Lebanon, also partners in the Euro-Mediterranean Partnership, scored low compared to European countries on the eighth grade science and math components of the 2003 TIMSS (Table 20). This is not to say that the news about science and math education in Europe is all positive. Results of PISA and TIMSS show significant variability in student achievement across European countries.

TABLE 18 Student/Teacher Ratios and Net Enrolment Rates at the Pre-primary, Primary, and Secondary Levels in Number of Euromed Countries for the Year 2004

Country	Pre-primary Education		Primary Education		Secondary Education	
	Student/Teacher Ratio	Net Enrolment Rate	Student/Teacher Ratio	Net Enrolment Rate	Student/Teacher Ratio	Net Enrolment Rate
Algeria	26	5	27	97	21	66
Cyprus	18	56	19	96	12	93
Egypt	24	13	22	94	17	79
France	18	100	19	99	11	95
Greece	13	67	12	99	9	84
Israel	...	95	15	98	10	89
Italy	12	99	11	99	11	91
Jordan	20	27	20	93	18	82
Lebanon	16	72	14	93	8	...
Libya	10
Malta	...	88	18	94	10	86
Morocco	17	46	28	86	18	35
Palestinian Authority	27	19	27	86	27	89
Spain	14	96	14	99	11	95
Syria	22	10	18	92	...	58
Tunisia	19	22	22	97	20	64

... Data not available

² Israel is included with European countries in the *Global Education Digest 2006* (UNESCO, 2006). Statistics presented in this document show that Israel is similar to European countries on many indicators including net enrolment rates, student/teacher ratios and gender equality.

³ See www.unicef.org/progressforchildren/2005n2/mideastafrica.php.

⁴ Net Enrolment rate is defined as the "Number of students in the theoretical age group for a given level of education enrolled in that level expressed as a percentage of the total population of that age group" (UNESCO, 2006).

⁵ See www.unicef.org/progressforchildren/2005n2/mideastafrica.php

TABLE 19		PISA 2003 Average Science and Math Literacy Scores and Average Scores on the Problem Solving Scale of 15-year-old Students		
	Average Science Literacy Scores for 15-year-old Students	Average Math Literacy Scores for 15-year-old Students	Average Scores of 15-year-old Students on the Problem-Solving Scale	
France	511	511	519	
Greece	481	445	449	
Spain	487	485	482	
Italy	486	466	470	
Turkey	434	423	408	
Tunisia	385	359	345	
Overall Average	500	500	500	

TABLE 20		TIMSS 2003 Science and Math Scores of 8th Grade Students	
	8th Grade Science Scores	8th Grade Math Grades	
Italy	491	484	
Israel	488	496	
Cyprus	441	459	
Palestinian Authority	425	390	
Egypt	421	406	
Tunisia	403	410	
Morocco	396	387	
Lebanon	393	433	
International Average	474	467	

Moreover, results of Project Rose⁶ show that students' attitudes toward and interest in science in many European countries are lower than those in many developing ones. Southern and eastern Mediterranean partners in the Euro-Mediterranean Partnership also lag behind European countries in access to information and communication technologies (ICTs). Table 21 indicates that Algeria, Libya, Egypt, Tunisia, Jordan, Morocco, Turkey and Lebanon have a lower number of Internet users per 1,000 inhabitants and a lower number of fixed line and mobile phone subscribers per 1,000 inhabitants than European countries bordering the Mediterranean. Moreover, many southern and eastern Mediterranean countries in the Partnership still face problems related to gender inequality because of the effect of the complex interaction of cultural, social, economic and political factors. However, despite all hurdles, women of the region have achieved significant, although not sufficient, accomplishments in the past decade (UNDP/RBAS 2006).

As evidenced in the above description of the status

of education in southern and eastern Mediterranean countries and in Europe, there are significant differences between these two regions in access to and quality of education. Consequently, collaboration in these two areas can be developed to benefit both. This collaboration can help achieve the goals of the *Dakar Framework for Action, Education for All: Meeting our Collective Commitments* (UNESCO, 2000) which affirmed the universal right of access to high quality education and strongly recommended that all countries move toward achieving the goals of Education for All. Participants in the Dakar conference pledged to meet, among other things, the learning needs of all young people and adults, eliminate gender inequality in primary and secondary education, and create healthy and safe environments conducive to high quality learning. Moreover, they committed to developing responsive, participatory and accountable systems of education, enhance the status, morale and professionalism of teachers, and employ new ICTs to achieve the goals of Education for All (Billeh,

⁶ See www.ils.uio.no/forskning/rose/

TABLE 21 Internet Users and Fixed and Mobile Line Subscribers for 2004

Countries	Internet Users per 1,000 Inhabitants	Fixed Line and Mobile Phone Subscribers per 1,000 Inhabitants
Algeria	26	215
Libya	36	...
Egypt	54	235
Tunisia	84	480
Jordan	114	419
Morocco	117	357
Turkey	142	751
Lebanon	169	429
Greece	177	1,465
Spain	336	1,321
Cyprus	361	1,282
France	414	1,299
Israel	471	1,499
Italy	501	1,541

Source: <http://devdata.worldbank.org/data-query>

BouJaoude and Sulieman, 2002). In addition, UNESCO (2001, 2002) encouraged countries to give high priority to secondary education, specifically, by reforming curriculum content, teaching, and examinations, linking secondary education with the world of work to increase its relevance and rethinking the roles of teachers, school leaders and other education personnel.

How can the Euro-Mediterranean Partnership contribute to increasing access to and quality of education in the region? In the remaining part of this paper, approaches that can be used in this collaboration will be discussed.

Access to Education

There are two access-related problems that require attention in most Euromed partner states: increasing access to secondary and pre-primary education for all students and attending to gender-related access issues. Southern and eastern Mediterranean countries such as Morocco, Syria, Algeria and Tunisia have net enrolment rates of 35, 58, 66 and 64 respectively as compared to an enrolment rate of 84 in Greece, which has the lowest rate among the European countries in Table 18. This relatively low access to secondary education is problematic at a time when an educated citizenry is necessary for social and economic development. Moreover, enrolment rates in pre-primary education are very low

in partner countries compared to European ones; a situation that disadvantages students and decreases their chances of success at the primary level. To remedy this problem, a variety of approaches can be used such as: 1) providing funds for countries to build schools in areas of most need in different partner countries. These funds have to be linked to national strategies and plans and ought to encourage the widest possible collaboration and contributions of the community, including the business community. Building more schools, however, might not by itself solve access problems if they are not associated with campaigns to persuade parents of the value of education for improving their and their children's, especially girls, social and economic welfare; 2) special programs might have to be developed for special groups of young people whose ages do not allow them to join regular schools. For example, programs could be designed for young children who need accelerated programs to prepare them to join mainstream classes because they did not join the formal education system at the appropriate age. Other programs might be needed for young adults who might be working and thus cannot join regular classes; and 3) access of girls to education should be a priority in programs to increase access. Funds provided to partner countries might have to be conditional to reaching specific targets for access of girls to education and making education more girl-friendly⁷. All the above interventions have to be done in a culturally friendly approach to reduce the

⁷ See EUROMED Partnership: Acting for Gender Equality (2006) for a number of activities funded by the European Commission to reduce gender inequality in the EUROMED partner states.

possibility of negative reactions that could be detrimental to well-intentioned but misunderstood programs and initiatives.

Quality of Education and Curriculum Relevance

Increasing access to education might solve the problem of the *degree* to which education is available to students in most Euromed partner states. While this increased access is necessary, it is not sufficient to help students move safely into the twenty-first century. What is in fact needed is a change in the *kind*⁸ of education that is made available to students in Euromed partner states. All these students should have access to high quality education that responds and is relevant to their needs and the needs of society, provides them with skills appropriate for the twenty-first century and helps them develop lifelong learning skills. The recommendations provided below might benefit students in European as well as in Euromed partner states.

One set of considerations for improving education was presented by Resnick⁹ (2001). Resnick proposed nine principles of education that have the potential to define the nature of education in the twenty-first century derived from a synthesis of research in psychology and education. These are 1) organising for effort, 2) clear expectations, 3) fair and credible evaluations, 4) recognition of accomplishment, 5) academic rigor in a thinking curriculum, 6) accountable talk, 7) socialising intelligence, 8) self-management of learning and 9) learning as apprenticeship. These principles can be used to design programs that aim to prepare thoughtful, reflective and competent individuals capable of living and working in the scientifically and technologically changing world of the twenty-first century. These principles are elaborated below.

Schools in the twenty-first century should convey the message that *effort*, not merely aptitude, produces high achievement in *all* students. Accordingly, these schools support all students to develop skills, knowledge and attitudes necessary to succeed and excel in all subject areas and in life. Furthermore, effort-based schools have clear and *high expectations* that stakeholders including students, school administrators, teachers,

parents and the community share. These expectations require students to achieve minimum, although high, standards in all curricular areas, particularly in math, science and technology because these provide them with the tools to succeed in a scientifically and technologically rich world. Finally, effort-based schools do not tolerate mediocrity because it has the potential to widen the gap between those who have access to appropriate and useful knowledge and those who do not.

However, a context in which all students are expected to invest the effort to achieve high and challenging standards demands *fair and credible evaluation* that is recognised as such by all stakeholders. In the competitive environment of the new global community, society in general, and businesses more specifically, cannot afford to re-teach students who have just graduated from high school. They expect high school graduates to have mastered knowledge and skills and developed positive attitudes on which they can build and that they can transfer across domains and to novel situations. Teaching the “what” of knowledge is no longer sufficient; what is needed is underscoring the “how” in order to prepare students to be active producers rather than passive consumers of knowledge. When students exert the effort to achieve high and demanding standards and when evaluations are fair and credible, *authentic achievement should be recognised and rewarded*. Providing students with meaningful formative feedback and recognising and rewarding their achievements are necessary processes that guide them to produce high quality independent work.

Curricula in twenty-first century effort-based schools cannot continue to focus on old basics. *Critical thinking and problem-solving should be the new basics in the new millennium*. Learning and teaching content that is irrelevant to students’ lives and society is unacceptable. Also unacceptable is teaching thinking and problem solving isolated from subject matter. Thinking and a solid foundation of knowledge are inseparable: it is impossible to teach content without teaching thinking skills and thinking skills without content. Being “*intelligent*” is a social activity that requires problem-solving and reasoning abilities along with the preparedness to use these abilities to solve academic and everyday problems such as

⁸ See Jurdak, M. (1994). Selected lectures from the 7th International Congress on Mathematics Education, Quebec, Canada, August 1992, for a discussion of the differences between degree and kind of education.

⁹ See also www.instituteforlearning.org and Billeh, V., BouJaoude, S., & Sulieman, S. (2002).

problems associated with the environment. These abilities develop when teachers expect students to use them and provide opportunities for students to practice them. Finally, teaching thinking integrated with content should not be restricted to programs for the gifted and talented, as is currently the case in many schools. It should be an integral component of the curricula of all schools. To say it succinctly, *all* students in the twenty-first century need to develop critical thinking skills and a strong foundation of content that will make them productive and successful citizens.

Twenty-first century curricula at all education levels and in all subject areas should be *rigorous and organised around major concepts* that allow students to think and solve authentic and meaningful problems. If a rigorous thinking curriculum is advisable in all subject areas, it is essential in science and technology. The rate at which scientific knowledge is produced and technological advances are developed necessitates the emphasis on mastery of core concepts, thinking and problem-solving skills, and skills for lifelong learning. It also requires that students learn and apply science inquiry and investigative skills and understand the relationships between science, technology and society.

Research has revealed the existence of relationships between engagement in classroom discourse and achievement. This research has demonstrated that encouraging students to talk in the classroom is not sufficient; what truly matters is that this talk be *accountable* to the learning community, to accurate and appropriate knowledge and to rigorous thinking. Accountable talk takes place within a community of learners, draws on evidence appropriate to the discipline and follows appropriate logical standards. When used appropriately, accountable talk develops student thinking and allows them to construct personal and meaningful knowledge. Accountable talk models the process of scientific and technological inquiry in that its arguments take into consideration experiences of others along with new evidence to produce new claims. Helping students to use accountable talk at all educational levels and in all school subjects is instrumental in preparing them to be responsible citizens and life long inquirers and learners.

The principles of education discussed above do not yield positive results if the educational process is controlled by others, especially the teacher. Thinking rigorously and using accountable talk call for helping

students to develop a set of *self-monitoring strategies* that will help them manage their learning personally. The self-monitoring and self-correcting skills -metacognitive skills—characterise successful and efficient individuals who are persistent in their attempts to decide what new knowledge and skills they need to stay up-to-date in an ever-changing world. Developing self-monitoring skills is especially important in the scientifically and technologically changing world in which students live; a world that requires them to keep up with the new knowledge and skills needed in the world of work.

Finally, schools of the twenty-first century have to benefit from what is known about apprenticeship learning because of its possible implications for education. Apprenticeships help students to gain complex interdisciplinary knowledge, learn the norms of professional communities, develop practical abilities and skills in a natural setting and, more importantly, to create authentic products under the supervision of experts. Schools benefit from creating school environments that approximate the natural setting of knowledge production and work in order to maximise students' learning and make school learning more relevant to students' lives and the world of work.

Recommendations regarding the need for educational reforms advanced in the Partnership for 21st Century Skills¹⁰ and reform in science and technology education advocated by Bybee and Fuchs (2006) echo those presented by Resnick (2001). Bybee and Fuchs' recommendations identify the need for high quality teachers, rigorous content and coherent curricula, suitable classroom tests and assessments aligned with twenty-first century goals. Moreover, they identify the need to prepare citizens who have critical thinking skills, are able to use complex communications skills and have the ability to solve semi-structured and everyday problems. According to Bybee and Fuchs "These sound much like the abilities that students could acquire after instructional activities designed to give them practice in the processes of scientific inquiry and technological design" (p. 350). In its turn, the Partnership for 21st Century Skills recommends putting emphasis on understanding core academic content at high levels, learning information and communication skills, thinking and problem-solving skills, and interpersonal and self-directional skills. Moreover, it stresses the need to develop ICT literacy defined as "the interest, attitude

¹⁰ See www.21stcenturyskills.org/

MEDINNOV: THE EURO-MEDITERRANEAN INNOVATION NETWORK

Medinnov, the Euro-Mediterranean Network for Innovation, was created in 2005 by Marseille Innovation, a member of the ANIMA network. The founding charter was signed by representatives from 8 different Mediterranean countries. In recognition of the crucial role that innovation plays in corporate competitiveness and the importance of improving access to information and funding, Medinnov was designed to draw together key actors involved in the innovation process: practitioners (research laboratories and companies from different technological fields), decision-makers (political authorities, ministries, R&D agencies), and facilitators (investment promotion agencies, financial institutions).

The mission of this new Euro-Mediterranean network is to merge different initiatives by the above-mentioned actors in order to facilitate, promote, and accelerate innovation in the Mediterranean region and create synergies between public and private innovation actors and national networks that already exist in this field. Innovation in the Mediterranean could be boosted by improving reciprocal knowledge of research work, stimulating development, fostering the links between

research, innovation and industry, promoting joint research and innovation projects among teams in the Euro-Mediterranean region, and encouraging Mediterranean scientists to return to their home countries with their accumulated skills and knowledge (international experience, networking ability, innovation and management skills).

In conjunction with the Elgazala Centre of Communication Technologies of Tunisia, Marseille Innovation organised the 4th Mediterranean Meeting of ICT and Multimedia in Tunisia on 16th/17th May 2006. Such events are a common gathering point for small and medium-sized enterprises, institutions and universities that are interested in extending their activities through the Mediterranean.

For more information:

Medinnov www.medinnov.com

Medinnov Charter

www.medinnov.com/doc/medinnov05/charte_medinnov.pdf

Medinnov Meeting 2005

www.medinnov.com/cmedinnov05.html

and ability of individuals to appropriately use digital technology and communication tools to access, manage, integrate and evaluate information, construct new knowledge and communicate with others in order to participate effectively in society" (Van Joolingen, 2004). Finally, the Partnership for 21st Century Skills proposes that teaching and learning be implemented in a twenty-first century context, which necessitates learning academic content through real-world examples, applications and experiences and using appropriate tools and approaches to measure students' performance on twenty-first century content and skills. These approaches help to bridge the gap between the knowledge and skills most students acquire in school and those needed in typical 21st century communities and workplaces; between how students live and how they learn. The world in which students will live in the very near future, and in which many of them are presently living, will require all of them to have access to technology and to function in a technology-driven world that will call for multitasking and continuous adaptation and change. The appropriate use of ICT in schools is a recurrent recommendation in the reports about education in the twenty-first century summarised above. However, how can this be accomplished in a manner that benefits European and Euromed partners alike? The first step is to guarantee access to ICTs to as many students as possible, irrespective of their economic background, a step that will require cooperation and financial and technical assistance by European countries. The second, and more essential step, is

the meaningful integrating of electronic and information technologies into teacher preparation and consequently into classroom instruction. This integration should enable teachers to master the necessary skills to prepare students who think critically, solve problems and are able to adapt, adopt, invent and evaluate technology for independent lifelong learning and informed decision-making.

Meaningful integration of electronic and information technologies should enable students to know how and why they use technology, appreciate the role of technology in modern society, understand the perils and benefits of using technology, and be conscious of the ethical dilemmas associated with the development and use of technological innovations in all realms of life. Furthermore, education should not simply teach students the technical skills needed to use technology, but ensure that technology is used as a vehicle for thinking and learning. What is needed is to integrate technology in teaching and learning subject matter through the use of a variety of available tools. For example, rather than merely providing students with access to the Internet and letting them use it unsystematically, they can be encouraged to conduct targeted explorations to access information sources, evaluate information from these sources, find answers to authentic problems and solve problems by using inquiry processes explicitly in all subject areas. The focus ought to be on helping students use the Internet and the available inquiry-enabling technologies (Hofstein

& Lunetta, 2004), such as calculator or computer-based laboratories, (CBL and MBL) in science to develop students' mathematical and scientific skills and abilities and make science learning as similar as possible to what goes on when scientific knowledge is constructed in laboratories and other research settings.

In summary, enhancing curriculum quality and relevance requires similar initiatives in all the Mediterranean states without neglecting the local culture of each of these states. It is evident that increasing quality requires learners to develop in-depth understanding of content, acquire and use thinking and problem solving skills, and apply the necessary effort to learn. It also requires educators to insure the alignment between curriculum content, teaching practices and assessment, and making education accessible to all. More importantly, it requires a redefinition of what constitutes "basics" in education. The basics of the new millennium include meaningful use of technology, rigorous content, and thinking, problem-solving, and lifelong learning skills, in addition to the traditional basics. This is because students in the twenty-first century will live in a "multitasking, multifaceted, technology-driven, diverse, vibrant world"¹¹ that requires them to take ownership of their learning.

In its turn, teaching should adapt to the requirements of life in the 21st century. Teaching decontextualised subject matter will result in inert knowledge that is neither useful nor enduring. What is needed is using teaching to bridge the gap between school and life by bringing life into the classroom and taking the classroom to everyday life. This bridging increases the relevance of the curriculum; a curriculum that should be designed to take account of the twenty-first century basics and help students learn with others cooperatively and solve academic and authentic everyday problems, for example environmental problems. Approaches that might be effective in achieving the goals of a twenty-first century curriculum might require valuing and assessing academic as well as instrumental knowledge by treating teaching and learning as apprenticeship, emphasising and evaluating students' ability to solve authentic problems, and emulating the modern world by making technology part and parcel of the teaching/learning process rather than an add-on to this process. Finally, even though educators might agree that the changes described above are necessary, none of these changes

will happen in the absence of the political will to change.

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¹¹ See www.21stcenturyskills.org/