

## EDITORIAL

# THE ROLE OF SCIENCE EDUCATION IN THE MEDITERRANEAN REGION

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**S**ocial structures in the Mediterranean basin have never aspired to either simplicity or homogeneity. That is not to say that one cannot find unifying attributes: a genuinely warm hospitality is immediately recognized by even the casual traveller to any part of the Mediterranean shores.

When in September 2002, we gathered for four days in Droushia, Cyprus, to reflect on science education around the Mediterranean, initially very little joined us. It is not just the strong influence on science education that has long been exerted by local historical and cultural traditions. The northern Mediterranean countries now have access to local and European research funding and are genuinely committed to an emerging science education research paradigm that aspires to offer a rigorous evidence – based platform from which to design and support the implementation of new science teaching and learning practices. The southern Mediterranean countries still grapple with the need for economic development and have to rely on the guidance of institutions such as UNESCO to lay the necessary foundation for achieving improved literacy rates in language, mathematics and science. On the eastern and north-eastern shores, conflict continues to evolve and, in that context, efforts to achieve security and to construct new national identities are bound to exert an influence on educational policy and practice. At the very centre of the Mediterranean, small island states strive with issues of governance and resource management in a world that is increasingly competitive on various scales.

### **Globalization, postcolonialism and multiculturalism**

Mediterranean societies are not new to all this; they have long been characterized by constant economic, political and cultural transformations, which create several tensions and complex dynamics across the region. Cultural, commercial, environmental, geopolitical, security, and military tensions have often been at the forefront of the relations between Mediterranean cultures. The region has for centuries been marked by conflicting differences and a number of unresolved crises. Several countries have been British or French colonies (e.g., Cyprus, Algeria, Malta,

Palestine) struggling to construct a postcolonial identity while still reflecting the cultural and knowledge traditions of their colonial forebears. Although Mediterranean societies are becoming more and more multicultural, partly due to globalization, some of them tend to avoid any reference to multiculturalism and prefer to identify themselves as strictly unicultural. Disrespect for minority cultures and cultural differences, as well as cultural intolerance, are also often reflected in various developments. Further, the antagonism between the 'north' and the 'south' regions of the Mediterranean is increasing: a 'north' that is more economically developed and is steeped in Catholicism and a 'south' that is underdeveloped and a home of Islam (Sultana, 1998). However, as Sultana (1998) warns us, Mediterranean unity and collaboration is a matter of survival, if we want to promote a culture of peace, justice and cultural tolerance.

Despite the fact that economic, cultural and educational trends in the different countries and societies occupy varying agendas and priorities, it is nevertheless possible to perceive a number of common characteristics among Mediterranean countries, which are worth noting. Among these, one can refer to a similar environment that has created virtually identical ecological problems to Mediterranean peoples such as waste disposal, the impact of tourism on coastal ecology and limited water resources (Gilmore, in Sultana, 1998). Especially, the limitation of water resources in the face of increasing demand causes increasing problems and has often generated conflict. Using resources sustainably, especially freshwater, preserving critical ecological functions and reducing pollution are issues that have long dominated the political priorities for both national and cross-national policy making. Further, according to Gilmore, a uniform Mediterranean ecology led to a number of common sociocultural traits such as 'atomistic' community life, strong religious orientation, an emphasis on shifting, noncorporate coalitions and intense parochialism. Finally, another common characteristic is the struggle of Mediterranean countries to avoid marginalization by the economic and political core that often comes from former colonial powers. Such common characteristics provide an important context and channel for the elaboration of the relationship between education and culture, and of an account of the possibilities for change through collaboration.

## **The contribution of learning in science**

One of the issues that came up in Droushia is the common need, throughout the Mediterranean countries, to connect science learning to citizenship, critical discourse and decision making. Transformative action that enters into any attempt at communication is clearly illustrated by one of the papers in this special issue

in the context of teacher transformation of innovative curricula in Spain and Italy. How do we safeguard science learning for all was also a joint concern, in a region which to a large extent relies on imported expertise that often ignores the local constraints and anticipations. The influence of UNESCO, in its perpetual effort to facilitate modernization by transferring recently evolved practices in the west to markedly different contexts, is evident in the paper from Palestine, where on the one hand the conflict with Israel is exerting an enormous toll on education and, on the other hand, the effort to build a system has to be applauded and admired. The struggle of many Mediterranean countries to develop ideas but also to take ideas, to adapt, to transform, to reflect and to write back is evident in many of the papers. The strain between local and global and the varied contexts of countries which traditionally are producers as compared to receivers of science knowledge, paint a mosaic of educational systems striving to claim a generative role in global science education.

A number of important drivers sustaining change in science education are identified. Firstly, on the global level, the knowledge society scenario promoted by the European Union implies, for instance, increased emphasis on lifelong learning skills and greater importance for the development of flexible thinking skills and capabilities such as meaningful navigation through knowledge. What cognitive resources are required for this and how do they relate to science education is one of the issues that remains open. The other important driver is the emerging science education research tradition, which in itself is also undergoing transformation from a process of generating new ideas about science teaching and learning to designing successful practice as a means of further elaborating theory in unison with an explicit view to improving the quality of learning.

Religion is the third of the driving forces that exert a strong influence in Mediterranean educational systems. In Arab countries, the tendency to begin each topic in the textbooks with a verse from the Koran is both perplexing and interesting, at the same time. In Palestine, one of the declared objectives of the science curriculum is to 'reinforce faith in God'. Apart from overt constraints, we also discovered some hidden resources: Fischbein in Israel and Baltas in Greece, whose writing may not be widely available in English, provide valuable epistemological support in their respective countries, thereby providing thoughtful local resources to any effort to attain reform.

The science for all trend that could be recognized in all countries is strongly reflected in the papers from Greece. The combination of formal and informal aspects of science learning into a non-formal paradigm presents an avenue for extending meaningful education outside school walls and into society, addressing differentiated learning styles and attracting younger people into scientific inquiry.

A number of the papers address ecological topics and the ways they could fruitfully be advanced through the educational system. The earth systems education approach takes a holistic perspective from the point of view of dynamic systems. In this context, and in the paper on water education from Israel, the issue of linking science learning to decision making capabilities reemerges alongside the need for situating science education in contexts that are relevant to the local society. For small and large countries alike, water is an issue of grave concern. It is also explored as a topic that can be addressed from multiple perspectives and an issue that could benefit from systematic analysis and thoughtful, caring approaches. In the paper from Israel, water management is used as a medium for peace education.

In this and other contexts, the importance of synergies re-emerges. For instance, it turns out that the design and development of effective curriculum, which engages many of the papers, requires collaboration between science education researchers, classroom teachers and other agents in the educational system.

Education, as well as collaboration in education among Mediterranean countries, is of central importance in trying to understand the tensions and face the challenges in this region. Science education, in particular, can contribute to the tensions and challenges faced by Mediterranean societies by promoting peace and prosperity. These are high priority areas of strategic importance for this region, as well as for the European Community and the Middle East. To focus on these goals, education in general and science education in particular should promote regional reforms that would lead to sustainable growth and improved living standards of the people of the Mediterranean.

The Droushia Seminar ended on a positive note. Our beliefs, interests, goals and value systems resonated in the end. We recognized value in the Mediterranean identity and cherish this with our other identities. Following the Droushia Seminar, authors made changes to their original manuscripts responding to mutual review efforts. The revised manuscripts were then reviewed by two anonymous referees each; all seven reviewers involved agreed to retain their anonymity. We would like to thank all reviewers and all colleagues who submitted papers for this special issue. Those whose work is published in this volume demonstrated remarkable patience and perseverance. Those who did not make it are sincerely thanked for their efforts, their valuable ideas and the contribution to the Droushia Seminar. We feel proud of the hard work during and after the seminar and as science educators, we submit the group's work and ideas as a small contribution to the formation of a critical discourse on learning in science in the Mediterranean in the interests of promoting peace, justice, tolerance, and environmental insight.

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## References

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