

IACME and Mathematics Education International Organizations in Latin America*

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Abstract

The evolution of the Inter-American Committee on Mathematics Education (IACME) as a network of regional and international cooperation will be described, as well as –with less detail– the Latin American Committee on Educational Mathematics (CLAME) and the Ibero-American Federation of Educational Mathematics (FISEM), and the Mathematics Education Network for Central America and Caribbean (RE-DUMATE). Emphasis will be placed on the overall meaning of their academic and organizational evolution. In particular, the relationships of IACME with the International Commission on Mathematical Instruction (ICMI) and the international community of Mathematics Education will be analyzed. Some perspectives will be considered.

1 In the middle of the “New Math” reform

Like elsewhere in Latin America, the *New Math* reform had a significant impact on building communities of Mathematics and Mathematics Education. This reform was propelled through various actions, the most relevant and comprehensive was the creation and activities of the *Inter-American Committee on Mathematics Education* (IACME). This initiative was driven by the American mathematician Marshall Stone (cf. Ruiz and Barrantes, 2011), one of the leaders of this reform who at the moment was president of ICMI (1959–1962). Stone had also been president of the *International Mathematical Union* (IMU) between 1952 and 1954. It is interesting to note that the *first Inter-American Conference on Mathematics Education* was conducted only nine years after the General Assembly of IMU recreated ICMI (an organization established in 1908 by proposal of David Eugene Smith) and eight years before the first *International Congress of Mathematics Education* (ICME) at Lyon, France, in 1969. It should be mentioned that the ideas of the *New Math* reform were not accepted unanimously within IACME (cf. Barrantes & Ruiz, 1998). Stone was president of IACME between 1961 and 1972. The

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important work of Howard Fehr, another influential champion, should also be recognized in organizing the first two conferences and the publication of its *Proceedings*.²

Regardless of the academic ideology and practical purposes of this reform, IACME provided a framework for international collaboration in two dimensions : first, between the Americas and the rest of the world, and, second, among the countries of the region. The collaboration had several results : it introduced ideas and discussions that were taking place within the international community of Mathematics and Mathematics Education, direct contacts were established between European and American professionals for years, many Latin Americans received scholarships to study Mathematics in developed countries, books and pamphlets on Mathematics and its teaching were generated in Latin America, *curricula* were influenced throughout all countries and the reform triggered important teacher development activities. Further, progress in the professionalization of mathematical practices in Latin America was made through this collaboration (cf. Barrantes & Ruiz, 1998).

In most countries of the region the university communities of Mathematics and teaching of Mathematics developed in an integrated manner for several years, with some exceptions. In fact, many times the same persons were both mathematicians and mathematics educators. It is important to note precisely the crucial role of the Spanish-Argentinian mathematician Luis Santaló, who was president of IACME from 1972 to 1979 (see CIAEM 2011a). However, there was another development within the community of teachers, which was more associated with general aims within education.

2 IACME begins a second stage

IACME began a second historical stage in the late 70's under the leadership of Ubiratan D'Ambrosio (IACME president 1979-1987). Two circumstances were important : the celebration of ICME 3 in 1976 and IACME V in 1979. The Karlsruhe ICME had a more open structure than the previous, allowing the incorporation of professionals from the developing world. In particular, the participation by D'Ambrosio himself was relevant in the International Program Committee and his appointment as head of the *Survey Report* "Objectives and Goals of Mathematics Education (Why Teach Mathematics)" (cf. D'Ambrosio, 2008). On the other hand, the IACME of Campinas, organized by D'Ambrosio, also represents a crucial change, a departure from the influence of Stone, both in the structure of the conference and its themes : an inclusion of distinct issues of special interest present in the international community of Mathematics Education. The influence of ICME 3 was evident. With D'Ambrosio, a strengthening of the relationship between ICMI and IACME was developed and a refreshing perspective of this organization that had just turned 18 years old also emerged. D'Ambrosio (2008) notes that, prior to this conference, the influence of the *Commission Internationale pour l'Etude et l'Enseignement de l'Amélioration des Mathématiques* was even greater than ICMI's. However in IACME III, Bahía Blanca, 1972, the main speaker was Hans Freudenthal

2. Years later, for the publication of the IACME *Proceedings* was instrumental Edward Jacobsen (from the USA) from its position at the UNESCO office in Paris.

(ICMI President 1967–1970). This moment was very fruitful. *Ethnomathematics*, one of the contributions associated with D'Ambrosio, began in this period. IACME even had a role in the defense of Latin American mathematicians who were imprisoned for political reasons.

3 The last quarter of the twenty-first century

The evolution of Mathematics Education and international organizations within the region cannot be studied apart from large social vectors that influenced these countries. The decade of the 1970's provoked a significant change in higher education in the Americas. There was a dramatic increase in the number of students. It started in the post-war baby boom and was first expressed in pre-university education (Ruiz, 2001). Between the late 1960s and the 1980s universities graduated many professionals in various fields. New generations of mathematicians and mathematics teachers developed, the numbers of mathematics students from the region formed in countries like USA, France, Great Britain, or Germany were multiplied. Similarly, university departments and research centers were created or strengthened in most countries of the region. The Mathematics and Mathematics-teaching communities were transformed. And something very important : the in-service teacher population in elementary and secondary institutions had widened dramatically. This would impact higher education and specifically the networks of Mathematics and Mathematics Education with additional needs.

In the mid 1980's and early 1990's the community of Mathematics Education in the region demanded :

- More meetings of researchers and also of teachers. There were necessary national or sub-regional meetings when there were no conditions for nationals.
- A higher frequency in the meetings was required due to social needs and professional affirmation.
- Spaces for publication in Spanish and Portuguese were needed to allow many professionals to write in their own language. By the same token, universities pushed for wider academic production.
- Different academic and organizational spaces to express diverse views about Mathematics and its teaching.

IACME did not intend to meet all these demands.

4 CLAME

In 1987, the *Reuniones Centroamericanas y del Caribe sobre Formación de Profesores e Investigación en Matemática Educativa* (Central American and Caribbean Meeting on Teacher Training and Research in Educational Mathematics) began, with a significant influence of Mexican researchers in Mathematics Education. In 1996, these meetings gave rise to the *Comité Latinoamericano de Matemática Educativa* (Latin American Committee of Educational Mathematics, cf. CLAME, 2011) and one year later the annual

conferences became known as *Reuniones Latinoamericanas de Matemática Educativa* – RELME (Latin American Meetings on Educational Mathematics). The adoption of the Spanish terms “matemática educativa – educational Mathematics” and not “Educación Matemática – Mathematics Education” (which was an idea taken from Mexican Eugenio Filloy), was a way of socially and ideologically affirming a new trend and also to distance itself from IACME. A new academic and organizational space for Mathematics Education in Latin America was created : another network.

Among its most important features were a frequency of annual meetings and a focus of interest only to Latin America, and even sometimes adopting a rhetorical “anti-gringo” bias very common in this region. These two characteristics differentiate CLAME from IACME, since the latter has its conferences every four years (as ICMI and other international organizations). Similarly IACME, though essentially acting in Latin America, has always sought to integrate teachers and researchers from the U.S. and Canada, as well as Spanish and Portuguese non-speaking countries of the Southern Americas (although admittedly this latter intention has been less successful). IACME has kept a pluralistic and internationalist attitude.

This new organization developed successfully ; CLAME offered an answer to local needs for social and professional links between teachers and researchers, and for academic spaces in which to present papers, something demanded by the institutions of the region. Its main leader was Ricardo Cantoral (México). In addition to the frequent meetings, it created in 1997 RELIME (*Revista Latinoamericana de Matemática Educativa*), an academic journal in the discipline that has been important as a means of publication for many professionals in the region. Its focus has been on research, but it also publishes accounts of classroom practice. CLAME also propelled the publication of books for projects and works presented at its conferences.

Later on, it was established as a regulated membership society, similar to national academic societies.

5 CIBEM-FISEM

Another meeting space was born inside IACME : the *Ibero-American Congresses of Mathematics Education* (CIBEM). Negotiated at the IACME VI in Guadalajara (1985) and created during IACME VII in the Dominican Republic (1987), the CIBEM were developed with the participation of Spanish, Portuguese and Latin Americans. The congresses should be held in mid-term of the four years between IACME conferences. The initiative responded primarily to the interests of the Spanish community of Mathematics Education, particularly around *the Sociedad THALES de profesores de matemáticas* in Andalusia (Gonzalo Sánchez Vázquez was the main proponent). The Spanish sought support for the realization of an ICME in Seville (which was actually held in 1996). This was facilitated by the direct contact of IACME members with ICMI and by conducting a CIBEM in Seville (1990) to show their capabilities. The new meetings were supposed to be two in Latin America and one in Spain or Portugal, with the aim of targeting many participants from both continents at all times. Meetings have taken place with an

important exchange between members of professional communities of both continents though without a broader international presence or impact.

Unlike IACME, these CIBEM events originally did not intend to become a permanent organization. However, in recent years the *Ibero-American Federation of Societies of Mathematics Education* (FISEM) (<http://www.fisem.org>) was created which has become an important organizational reference for mathematics education in the region. In 2013, it had 17 affiliated societies. There are large differences between countries : as an example, in Costa Rica the local mathematics education society affiliates no more than 30 persons and could not hold congresses, meanwhile in Brazil with thousands of members they conduct their *Encontro Nacional de Educação Matemática* that gathers almost 4000 participants.

This organization created in 2005 *Union (Revista Iberoamericana de Educación Matemática)*, an academic journal aimed primarily to serve as a tool for action in the classroom. This federation has sponsored the CIBEM in recent times. In the creation of this federation and in the development of these congresses there has been again a major influence of the Spanish societies of Mathematics teachers. Among its key leaders have been Luis Valbuena and more recently Agustín Carrillo.

6 A new scenario

In the past 20 years there has been another development in Mathematics Education influenced by global conditions.

- Demand for more higher education institutions, which has promoted the creation of many private institutions.
- Changes in the ideologies that dominated in Latin America during the Cold War.
- Intensification of internationalization and globalization of economic, social and cultural development.
- Extraordinary impact of digital technologies, Internet and social networking communication and a new consciousness of reality.
- New opportunities for academic development due to the improvement of the socio-economic and political situation of Latin America.

This has influenced at least two dimensions : the ideals of young professionals have changed, and the demands on the quality of academic output have increased. It has strengthened a transformation of perspectives and possibilities for international organizations in the region in terms of :

- Academic events (frequency, regularity, type of participants, quality of events, mechanisms of organization)
- Publications (composition of their editorial boards, aspirations and quality, distribution)
- Organization (membership, regional links)
- Relationship with the international community.

It is complicated to organize international conferences in the region with annual regularity, since it often generates a sacrifice on the academic quality of these events and at the same time it means a great effort due to the large investment of resources needed to hold the events. On the other hand, the national academic societies require annual meetings, something that increases these complications.

On the other hand, globalization increasingly requires more quality of international publications and strengthening virtual systems for the distribution of publications.

The model of national academic societies with individual memberships is very difficult to achieve for a multi-national organization. It may also be seen as unnecessary in a world that has made social virtual and flexible networking a key form of communication and organization.

And finally, increasing the collaboration with the international community of Mathematics Education is a central demand.

7 IACME and the Mathematics Education international community

For IACME, building ties with the worldwide community of Mathematics Education is one of its main perspectives and activities. It has maintained an Inter-American perspective. For example, it has a close relationship with the National Council of Teachers of Mathematics (NCTM)³ and the group TODOS of the United States. This has been a constant since its inception, and one of its main strongholds.

The relationship of IACME with ICMI has been permanent, with ups and downs that have resulted from the composition of IACME and ICMI governing bodies and to the presence or absence of opportunities to deepen this relationship. Beginning with Marshall Stone as ICMI president, IACME participated in the executive committees of ICMI after 1979, as vice presidents D'Ambrosio (Brazil, 1979-1982) and Emilio Lluís (Mexico, 1987-1990), and as members-at-large Eduardo Luna (Dominican Republic, 1991-1994) and Carlos Vasco (Colombia, 1995-1998). Between 1998 and 2008 there was not an IACME representative in the executive ICMI, although there were members from Latin America : Néstor Aguilera (Argentina, 1999-2002) and María Falk de Losada (Colombia, 2003-2006).

A new relationship between IACME and ICMI began in the IACME XII of Querétaro in 2007. ICMI played an important role, the president of ICMI at the time (Michèle Artigue), gave a main plenary address and was on the dais of dignitaries at the opening ceremony. This event served to support ICME 11 in Monterrey.

One factor that deepened this relationship was the incorporation of Angel Ruiz (president of IACME 2007-2015) within the International Program Committee of ICME 11, which allowed IACME members to set different actions in the Congress. A report on the activities of IACME activities was presented in the first independent General Assembly

3. Howard Fehr was a past president of NCTM when he assisted in the formation of IACME.

of ICMI.⁴ In ICME 11, the IACME president was elected one of the vice presidents of ICMI (for 2010–2012), strengthening further the relationship with ICMI.

Since 2008 the intensity of this relationship rose from several actions. First : it came from the realization of IACME XIII, held in Recife, Brazil. This conference was the largest and most important in the recent path of IACME. Several reasons converged to it :

- The 50th anniversary of the founding of IACME, which provided an environment of extraordinary historical significance.
- The participation of nearly 2000 people from 34 different countries, the main international event held in the discipline in the region.
- The high academic quality of this conference obtained through a careful evaluation system of the papers presented and the selection of guest speakers, about 50 renowned experts in the Latin American and world Mathematics Education community.
- The heavy use of technologies of communication and interaction for the organization of the conference, thus adding another dimension to the community of teachers and researchers within the region.

In this IACME XIII, ICMI presence was extraordinary. Artigue was again on the dais with dignitaries and was a keynote speaker, and among other keynote speakers were the Secretary General of ICMI at that time (Jaime Carvalho e Silva) and two former General-Secretaries of the same (Mogens Niss and Bernard Hodgson). The scientific program provided important spaces for the dissemination and reflection on the *ICMI project Klein* and the *ICMI Study* on the teaching of Statistics (with Carmen Batanero).

Second : in August 2012, in Costa Rica, a *Capacity and networking building in Mathematics and Mathematics Education* workshop (CANP 2012) was held. CANP is the most important initiative of ICMI to promote Mathematics Education in developing regions, and includes the sponsorship from the International Council of Science (ICSU) and IMU. (Cf. CANP, 2012). The funding and support for this event by ICMI had never before been given to a Latin American region.

Third : the new relationship between IACME and ICMI was formalized in late 2009 with the addition of IACME as the first *multinational organization affiliated* to ICMI (cf. ICMI, 2012).

However, it is necessary to make some historical precisions about this. First, since its creation, IACME was seen as an ICMI formal organization : IACME I was convened and organized directly by ICMI. The executive committee that was born there was associated freely and autonomously to ICMI. In the *Proceedings* of the II IACME (Lima 1966) Stones words were : “IACME is now a regional autonomous member of ICMI, according to the latest rules and terms of reference” (CIAEM, 1966 pp. 13–14). In fact, the statutes of IACME emanating from the second conference stated : “A. The Inter-American Committee on Mathematics Education (IACME), emerged from the Inter-American Conference for the Teaching of Mathematics, Bogotá 4–9 December 1961, is a nongovernmental entity, affiliated to the International Mathematical Union, through

4. See current ICMI's “Terms of Reference” in ICMI (2012).

the International Commission on Mathematical Instruction.” (Barrantes & Ruiz, 1998, p. 41). Years later, in 1974, the Executive Committee of ICMI in Vancouver, Canada, returned to endorse IACME as a regional group (cf. Furinghetti & Giacardi, 2012, cf. D’Ambrosio, 2008). In 2009, ICMI approved new terms of reference containing the figure of “affiliated organizations”, thus giving the possibility of incorporating various entities in the world ... including IACME. Until 2013, apart from IACME three more such multinational entities had acquired this status : the *International Commission for the Study and Improvement of Mathematics Teaching*, the *European Society for Research in Mathematics Education*, and the *Mathematics Education Research Group of Australasia* (cf. ICMI, 2012).

Fourth : Angel Ruiz was reelected as president of IACME for 2011–2015 and at the same time reelected as one of the vice-presidents of ICMI for 2013–2016⁵, reinforcing even more the relationship between IACME and ICMI.

8 Another international network in the region was born

In CANP 2012, the *Red de Educación Matemática de América Central y El Caribe* (*Mathematics Education Network for Central America and the Caribbean*, REDUMATE, <http://www.redumate.org>) was founded with a regional perspective towards Central America and the Caribbean, but with a broad international perspective. This network includes professionals from Panamá, Costa Rica, Dominican Republic, Colombia, Cuba, Puerto Rico and Venezuela, Spain, Colombia, México.

By November 2013, REDUMATE had organized the *First Congress on Mathematics Education for Central America and the Caribbean* (<http://i.cemacyc.org>) in the Dominican Republic, which was very successful (over 600 participants, 150 speakers from 19 countries).

IACME offered from the start its prestigious international organization to support both CANP and the first CEMACYC.

REDUMATE aims to fill a regional academic and professional space that was weakened when CLAME decided to extend its activities to all Latin America.

9 A third stage in the history of IACME

It can be said that in the middle of the first decade of the twenty-first century IACME started a third historical stage, characterized by :

- improving the academic standards at the conferences,
- strengthening of publications associated with its events,
- developing mechanisms for recognition of the support given by individuals to IACME and Mathematics Education in the region,

5. This was the only time a Latin American has been elected ICMI’s vice-president for two terms.

- using communication technologies more effectively both to organize events and in dissemination and development,
- revitalizing its structure and establishing explicit rules of organization,
- solidifying a closer relationship with the international community on Mathematics Education (through ICMI) and
- giving special attention to Central America and the Caribbean.

IACME XIII, in Recife, not only invited 50 prestigious guest speakers but included only half of 1800 received proposals after a rigorous scientific reviewing process. This scientific demand is part of IACME's aim to increase across the region the quality of the productions in this discipline and to adopt the best international standards.

Although several members of IACME have continuously participated on editorials boards of journals in and outside the region, it has never created its own journal. However, it preserved for many years a close association with the journal *Educación Matemática* edited in Mexico (<http://www.revista-educacion-matematica.com>). In this new stage it has established a close association with the journal *Cuadernos de Investigación y Formación en Educación Matemática*, edited in Costa Rica by Angel Ruiz (<http://revistas.ucr.ac.cr/index.php/cifem>); selected papers from IACME's conferences are published in this journal.

In 2011, the *Luis Santaló Medal* was created, which is awarded to a person who has been characterized to support for many years the development of IACME and Mathematics Education in the Americas. In that year the medal was awarded to Edward Jacobsen of the United States who had provided key support to IACME while at UNESCO from the 1970s to the 1990s.

Both IACME XIII and XIV have been organized using the *Open Conference Systems* platform promoting within the region a change in the way to organize academic events with heavy use of a technological platform in all its dimensions (several other events have already joined this perspective, but the IACME initiated in the region). By the same token, IACME's website it is not only an information tool but a relevant means of organization. This changes the way that the relationship between mathematics educators interested in IACME is developed.

In 2011, the new IACME approved its *Terms of Reference* and for the first time set explicitly the rights and tasks of their national representatives, created an executive committee including 6 members-at-large (defined by region), and established precise mechanisms for the election of all officers. IACME includes officers and national representatives, and their members and friends are part of a comprehensive, flexible and dynamic international network; its organization is not similar to the professional societies which exist within a country. During 2014–2015, IACME will build a virtual community as an outstanding leverage to develop communication between its partners and friends.

In this new stage, the link with the international mathematics education community has been strengthened through the relationship that has been generated with ICMI.

Finally, in this new stage a strategic alliance has been generated between IACME and REDUMATE that will be crucial for IACME and the whole community of the Mathematics Education in the Americas.

An interesting detail in this new stage was the participation of officers and former presidents and members of the IACMEs international network to support a deep curriculum reform of mathematics in all pre-university education in Costa Rica (see <http://www.reformamatematica.net>), conducted between 2010 and 2014 under the leadership of Angel Ruiz (Ruiz, 2013). It was an involvement of IACME in curriculum changes that have had a strong impact there. Several actions by REDUMATE and CIAEM have allowed to disseminate lessons of this important reform within the entire region.

10 Perspectives of Mathematics Education international organizations in the region

The role of international professional organizations in the region was and it will continue to be important in building communities in Mathematics teaching and research.

There has been disagreement and sometimes tension between members of these organizations (D'Ambrosio, 2008), especially between CLAME and IACME. The reasons have often been highly personal, but also ideological and organizational. And that has weakened collaborative actions in the region. However, in the new scenario several factors will lead to a reconsideration of such disagreements. First, because educators and researchers from the region in a significant percentage get involved in the activities of all organizations, there is not a sense of sectarian militancy with these networks as has been with political groups in Latin America. Second, because there are many horizontal contacts between the organizations' leaders and members, there has been a flow of key teachers and researchers from one organization to another. With or without explicit agreements or coordinating joint work between them, these factors push toward collaboration (at the CIBEM held in Uruguay in 2013, some agreements between CLAME and FISEM were reached).

With the strengthening of national societies in the region two things arise : the meaning of an international association gets strengthened and at the same time all multinational groups get pushed to redefine their objectives and structure. They all have strengths and weaknesses, but they are not identical. We will see changes in the characteristics and dynamics of these organizations.

Regardless of individuals who have been at the forefront of these organizations or their history or collections of ideas, much of the future of these organizations depends on how they will respond now to the challenges of diverse and increasingly large national communities, the greater demands for academic excellence and a closer relationship with the international community, and –this is key– on how they will promote the building of academic leadership in Mathematics Education. All of these challenges are within a region with urgent tasks to improve conditions and increase access to quality Mathematics Education.

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