

EDITORIAL

This issue of IJSME has six articles. In the national references for the authors we have: Australia, Germany, Jamaica, Korea, Taiwan and USA. The editors continue their effort to make IJSME a truly international journal, and continue to succeed.

The more countries we have represented in IJSME, the more we will need to pay attention to national and regional differences. In my view, this involves a raised awareness, by readers, authors and reviewers, of the fact that a truly inter-national journal is, inevitably, also a truly inter-cultural journal.

Those differences are not always easy to be perceived or understood, especially in these days, when the ideology of globalisation, strongly supported by all sorts of technologies, works towards making us believe that we are very much alike around the planet – or bound to become that similar quite soon. Biologically we may be that similar, but human thinking and action certainly goes well beyond the biological features of our beings.

In different parts of the planet there are, for instance, differences – often quite marked ones – in the areas of moral, religion, views of education – formal and informal – and the structure of institutions and society in general, just to indicate a few. How do those differences influence our work as mathematics and science educators, teachers and researchers? And also, how is someone from one part of the planet to make sense of what was produced in another part, seriously taking into consideration those differences?

My colleague Rosamund Sutherland has many times suggested that different mathematical traditions (applied, applicable, pure, theory-driven, problem-driven, and so on) are bound to be associated to different national or regional traditions in mathematics education, and it is not difficult to offer some explanation for that. But *how* does this work when we consider ethical, moral or religious values?

The reason I have for taking those considerations seriously, can be explained with one example. In any course I teach, regardless of the subject – Linear Algebra or Philosophy of Mathematics Education, just to exemplify –, I try as hard as I can to raise my students awareness of *difference*, and I do so because I believe that unless they understand that the thinking that produces the mathematics of the mathematician is *different* from the thinking we practice in everyday life – and so are the *values* associated with it –, they are bound to struggle and eventually fail. For instance, in

everyday life we do not talk about the properties of things that we don't know what they *are*. To engage in conversation like “it is sweet and it is fatty, so probably it is sticky” only makes *some* sense in charade games.

It has been a while since colleagues like Ubiratan D' Ambrosio and Alan Bishop first called our attention to the need to consider both culture and the processes of en/inculturation in relation to mathematics and science education, but although much has been done, for instance, the study of various ethnomatematics, I still feel that those considerations are usually only taken in specialised contexts (e.g., papers and articles specifically dealing with ethnomatematics or highly visible cultural differences), and in presenting this IJSME issue, I would like to offer a personal view on how ‘culture,’ ‘cultural’ and ‘difference’ are present in all our work in mathematics and science education, and I will do so with the help of the six quite interesting articles published here.

As I read the six articles, those words got associated to various ‘actors’: article authors, research subjects and institutions. Just to offer some preview of what I will say, I consider, for instance, that the theoretical assumptions of authors should be taken as a cultural value – although many times that culture is not strictly associated to national demarcations, of course. And also to consider that the structure of the school system and the school ‘imaginary’ of the place where a piece of research is conducted is a necessary component for readers to make sense of what a research report says. And in saying so, I wish to position myself as a Brazilian person, from the southeastern state of São Paulo, the most affluent in the country, and lived most of my life in the capital of the state (also named São Paulo), a place with a high index of connection with the rest of the world.

As some kind of disclaimer, I would like to make clear, at this point, that nothing I am about to say is directed towards any specific judgement of the papers I read – I immensely enjoyed reading all of them; my comments are particularly directed towards my own understanding of research in our fields, but in the hope they can be useful to others.

I begin with Yuh-Chyn Leu's article, *The Enactment and Perception of Mathematical Pedagogical Values in an Elementary Classroom: Buddhism Confucianism and Curriculum Reform*. It is possible that such a study has been published, but I have never seen a paper on how Catholic values influence the enactment and perception of mathematics pedagogical values in an elementary classroom, borrowing from the title of Yuh-Chyn Leu's beautiful article, and leading me to reflect about this was the first contribution the article offered to me, personally. Catholic values in my country are not usually seen as driving teacher actions, unless, perhaps, you look inside catholic schools. Why is it so? This article gives me an

opportunity to begin to learn more about this, so maybe in the future my research will be better informed.

But it also showed me some of the author's views about life, as it informs us that the teacher only agreed to take part in the study because she learned that the researcher was also a Buddhist. I think this makes a difference, as now I know this researcher was not doing a personally removed sociological study, and that adds weight to his insights and comments without – in my view – creating the risk of a biased analysis. Quite on the contrary, explicit assumptions are always better than hidden ones unless, as Slavoj Žižek points out, you want to enact ideologies efficiently.

As a westerner living in a predominantly Catholic country, maybe I could feel a little inclined to think that this article has little to tell me, apart from somehow incrementing my 'general culture.' The theoretical background and the data collection and analysis procedures are quite standard, and there are so few Buddhist teachers in Brazil that the actual situation examined has little applicability in my country. Why, then, has it impressed me?

I think the main reason is that the article made me feel 'there,' with Ms. Chen, the students and the researcher, and that gave me the chance to learn a little about life in Taiwan – school life *too*. This article gave me the feeling of watching a documentary film, rather than reading a research report, and I say this in a commending manner. Much too often we present research results in a way to make them look more 'universal' or 'scientific,' and that is usually done by removing from the text the story telling component – and in doing so, removing the cultural component, the *culturality* of the study. Yuh-Chyn Leu manages to keep the story telling in the text, at the same time clarity is preserved in the research reporting, and this combination gives us a quite rich view of how the work of the researcher was done *inside* that culture, rather than being *about* that culture, and I believe this only enhances the quality of the concern with cultural values.

Another key aspect of this article is that it is an article on mathematics education that has very little Mathematics in it; in fact, whichever is present appears only as the author wants to indicate percentages, indicate time or occurrences of a certain type of intervention. The Mathematics – as it would be in the subject matter a teacher might want his/her students to learn – is simply *there*, in a sense, as if it were 'in the air,' deserving no specification, and it is present precisely through its *values*, rather than through its *content*. This gives the article great coherence, pointing out that education is, to a great extent, a matter of attitude towards education, and this is, in my view, an important *cultural* component.

Now I move to *Correlations Among Six Learner Variables and the Performance of a Sample of Jamaican Eleventh-Graders on Respiration*, by Kola Soyibo and Jacqueline Pinnock, and from reading the very names of the authors, my Brazilianness handicaps me: is Kola Soyibo a male or female colleague? And I ask this question without making any further considerations about whether this matters or not; it came to my mind together with the understanding that maybe I wish, from research reports, more than research question, methodology, analysis and conclusions. Not that I do not want that, but I guess we readers could get more, and that would be helpful. Going back to the name/gender issue, we could use the 'surname strategy,' so I would have written 'by Soyibo and Pinnock,' but that would not quite solve *my* problem, because *I* know there are languages in which surnames are declined by gender, so the wife of the deceased Soviet Union leader was named Raisa *Gorbacheva*, and not *Gorbachev*, as her husband.

But then, I have to consider that authors have their own views about this, and perhaps some authors assume that such issues, and the story telling, do not serve the purpose of academic investigations, particularly in the sharing/reporting stage. This is the kind of consideration I classify as being about the authors' cultures (values imbedded in their choices), and perhaps it would be useful to have a forum to discuss such issues as *values*, rather than only as competing theoretical, scientific, assumptions, as it usually happens.

The article by Soyibo and Pinnock has a clear concern with socio-cultural issues, as two-thirds of the variables they chose to study show – gender, school location, socioeconomic background and school type (co-ed or not) –, and the results do point to some questions to be further probed – for instance, do girls need more incentive from teachers to be more competitive in school? I think this question would gain in interest, to a broader audience, if it came with the addition of 'in Jamaica,' and that led me to four simple questions I now seriously consider trying to answer: (1) *how* is it to be a boy or to be a girl *in Jamaica?*; (2) *how* is it to study in an urban or in a rural area school *in Jamaica?*; (3) *how* is it to have a high or a low socioeconomic background *in Jamaica?*; and (4) *how* is it to study in all-girls, all-boys or mixed gender schools *in Jamaica?*

These are questions I ask *as a Brazilian*, and my intention in sketching them was to provide *myself* with an awareness-raising tool. What I gained from reflecting on those issues – and this is related to what I gained in reading Yuh-Chyn Leu's article – was a raised awareness of how dangerously I may be taking for granted the culture and cultural aspects of the situations I study myself in Brazil, perhaps to the point of universalising them.

The next article I will invite to help me, is Phil Seok Oh and Myeong-Kyeong Shin's *Students' Reflections on Implementation of Group Investigation in Korean Secondary Science Classrooms*. As a reviewer to IJSME, I get submissions without authors' names and national references. My first reaction after reading this article (which I did not review, incidentally) was to ask myself 'could it have been written by Romulo Lins and Marcos Teixeira, from Brazil?', and the answer was 'yes.' I guess I have already made clear my taste for story-telling and local flavour, but *as a reviewer* I do not think I should ask for this from the authors. Instead, I tried my best to make sense of the article *in its own terms*: what kind of assumptions – theoretical or otherwise – make it plausible to present the research report in a way in which it is difficult to decide whether the research was made in Korea or in Brazil? Even more so, because I had recently read a full-blown article in a Brazilian magazine, in which the reasons for the Korean success story, based on education, are examined. I asked myself, in earnest, whether I was supposed to suspend all my exposition to that article, and somehow neutralise the research being reported. And I decided that, yes, to honour the authors, I should do that.

I scanned the article, back and forth, until I found an element that made things make sense. The authors state that they spouse constructivism, and even without further specification, provisionally opting for a Piagetian constructivism allowed me to understand that *maybe* what I see as 'culture' was there seen as 'environment' and, with that respect, it is *plausible* that Korean 'culture and traditions,' in that case, were understood as rather close to Brazilian urban São Paulo 'culture'/environment.

However, I brought to this article's reading, the interests I had developed in relation to the article by Soyibo and Pinnock. For instance, in Brazil there is a general view that people from the far (to Brazilians) east are quite reserved and appreciate individual competitive work. 'What would be the reasons for introducing, in Korean schools, cooperative, inquiry-based, approaches?', I asked myself. In Brazil, people are, generally, quite 'social' and like talking with each other (especially story-telling. . .). Would the GI work offer a motivational advantage *to Brazilian students*? Offer a cognitive development advantage *to Brazilian students*?

The next article (in my own ordering) is *Evaluation of an Innovative Mathematics Program in Terms of Classroom Environment Student Attitudes, and Conceptual Development*, by Howard Spinner and Barry J. Fraser.

Similarly to the previous article, my 'reviewer feeling' was that, apart from a few clues, this study could have been conducted in Brazil or Korea, so many of the considerations above apply here. I was amazed to notice

that a study coming from Australia called *less* for my ‘cultural attention’ than the one reported in Phil Seok Oh and Myeong-Kyeong Shin’s, and this has strengthened the need to examine more closely *how* difference and sameness have developed in my mind, quite as much as in relation to the name/gender issue.

The title of the article also made me think. ‘Innovative.’ I have myself produced research reports in which title I used this word, but in the context of producing this editorial, I realised that I had used it with a technical meaning – close to that attached to it in ‘technological innovation’ –, without asking myself ‘why innovation?’ and in the hope of finding a satisfactory answer. I find it intriguing that the more our field grows, the more it seems we should be producing more new approaches in mathematics and science education and, again, I find the parallel with technology useful but in a twisted way. While in technology new creations allow more control over technology, perhaps in our fields our research has mostly shown to us that the problems and difficulties are bigger than we imagined before. That could lead us, of course, to the paradoxical idea that we should stop doing research before the problem becomes too ugly, but my professional sanity is preserved by remembering Korea’s success story based on education, although that also forces me to ask myself, again, ‘why, then, Brazil does not achieve the same success?’ a somewhat saddening question for a Brazilian to ask.

The last two papers are *Village Elders’ and Secondary School Students’ Explanations of Natural Phenomena in Papua New Guinea* – by Soikava Puka, David F. Treagust and Bruce Waldrip –, and *Models of ‘the Heavens and Earth’: an Investigation of German and Taiwanese Students’ Alternative Conceptions of the Universe* – by Shu-Chiu Liu. I think it is useful to contrast the two in relation to the idea of ‘harmonising.’

In Puka, Treagust and Waldrip’s article, that idea is discussed in the context of confronting a ‘street’ sense of the world with a ‘school’ sense of the world. I see this as a *horizontal* confrontation, as the elders interviewed are mature adults, and the school science is the domain of mature adult teachers. The strategy of exposing the confrontation through the students’ ‘double-life’ (in the villages and in the school) is quite efficient, as we readers are led to face a conflict that is not abstract, but rather concrete, in the life of those students. Here we find ‘culture’ at its best, in its concrete immateriality, as the two kinds of knowledge legitimacy – the elders’ and the school’s legitimacies – can co-live ‘inside’ those students.

The strong degree of *difference* between school scientific concepts and the traditional village knowledge, suggested to me that I needed to develop a sharper eye for not so strong differences, and in trying to see how much

difference I could see, I realised that in Brazil it is quite common – in fact, amazingly common – that people treat objects as if they were alive: people kick cars that will not start, punch TV sets that are not displaying properly and curse the rain that ‘decided’ to fall down *just as I got ready to leave to a party* – and we talking here about adult people. It is even *legitimate* to talk to plants – given they do not reply. I *could* say that those people are not *seriously* thinking that the car is going to change because of the punishment, but Puka, Treagust and Waldrip’s article led me to consider that in saying so, maybe what I am actually doing is not taking *seriously* the way those people think. And if adults do that, it is reasonable to suspect that children are also learning to do so. And *teachers* do so, so maybe in schools a lot of the discourse is unintentionally filled with animist suggestions.

Shu-Chiu Liu’s article, on the other hand, deals with a *vertical* confrontation – between naïve, spontaneous conceptions, and school science concepts, so the main interest is in children development, more precisely, what can prevent or hinder development. Comparing this with the previous article, I understood that an interest in development may naturally lead to less interest in the children’s cultures, as the focus of attention is on cognitive development, instead of being on cultural differences, and here we get to the issue of ‘harmonising.’

In Puka, Treagust and Waldrip’s article, the *horizontal* confrontation produces a concern with ‘harmonising cultures,’ and in favour of *cultures* (the village’s and the school’s), while in Shu-Chiu Liu’s article the *vertical* confrontation produces a concern with ‘harmonising conceptions with concepts,’ and in favour of one particular culture, that of Science.

It is not for me or anyone else to produce a judgement in abstract, on whether one of the two concerns is ‘better’ than the other. This is something that can only be done against the political project that a given educational system is part of and, again, we are deeply immersed into *culture*. As I have learned from people like Paulo Gerdes and Gelsa Knijnik, what in some situations should be seen as plain cultural imperialism, in others is to be seen as a resistance or survival strategy.

As a reader who does not think 'progress' is a simple idea, I will always be interested in as much information as I can have about the authors' cultures and the research subjects' cultures, but also about the cultures of the institutions in and around the researched environments.

With this I finish telling this story, that of how I learned a great deal from reading the excellent articles in this issue of IJSME.

ROMULO CAMPOS LINS
*Department of Mathematics and
Postgraduate Program in Mathematics Education,
UNESP-Rio Claro, Brazil
E-mail: romlins@rc.unesp.br*