

# Is Math in the Classroom Neutral—or Dead?

## A View from Palestine

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I was born in Jerusalem, Palestine, in 1941. Except for a few years when I had to go out and study, I have lived all my life in Palestine. When I was born, the British were occupying Palestine, and thus the British system of education was used. After 1948, the Jordanian educational system was used. After the Israeli occupation in 1967, a strange combination of the Jordanian syllabus with Israeli intervention became the curriculum in schools. Since 1993 a so-called “Palestinian syllabus” is being developed.

What is startling about the math curriculum is—with the exception of some changes at the technical level—how stubborn and unchanging it has remained under the four completely different realities in which I have lived, studied, and taught; how insensitive and unresponsive it has been to the drastic changes that were taking place in the immediate environment! When something like this is noticed, it is only natural to ask whether this is due to the fact that math is neutral or that it is actually dead!

I personally believe that the math we teach or study has lost its life, its soul, and its connectedness to the realities in both the immediate and wider worlds. Changes that have accompanied the various realities in Palestine were so drastic that for math to go on unaffected raises many questions. Aspects which are important in people’s lives, and for which math is relevant, had no echo in any of the curricula used under the different realities. What is even more amazing is that most people, and in particular math teachers, do not see anything strange about that. *To me, this reflects the extent to which we have been conditioned to be passive participants in the teaching process.* The degree to which our minds—and senses—seem to have been dulled is frightening. It is very hard for me to escape concluding that the math we teach and study, at least in the schools and universities in Palestine, is basically like a corpse that doesn’t feel anything of its surroundings. At best, math is presented as a combination of fragmented technical skills and techniques.

I don’t think that the situation in Palestine is unique. In fact, places like Palestine and South Africa—where the situation is not too rigid and a lot of things are not yet settled down—could be very revealing and inspiring in relation to some aspects of life, including math education. They are convenient environments where “experiments” can be conducted “naturally”. In a sense, they are places where issues are more alive and “fresh” and, thus, can provide insights as well as opportunities for innovative ideas and perspectives to flourish. Such insights and perspectives are what people in places like Palestine and South Africa can contribute to the international debate in many fields, including math education. This article is an attempt in this direction, taking the Palestinian case for its context. I will choose the issues of our movement and of our relationship to the place

we inhabit and build in to illustrate the thrust of what I want to say.

### The example of the built environment

Palestinian life has been drastically torn apart twice in terms of our relationship to the place in which we live. The first time was when most Palestinians were driven out of their “natural” environment, were moved from living in homes, towns, and villages to living in refugee camps for almost five decades (so far). Even there, in the camps, their lives have been severely interrupted by the intrusions of tanks and war planes several times since 1948. To give just one example of a refugee camp, almost 100,000 people live in the Rafah refugee camp in the Gaza Strip within an area of less than one square mile, with no resources or access to a means of livelihood! Their drinking water is not safe and, next to the camp, there is a sewage “lake”. This is typical of the refugee camps in the Gaza Strip. There are eight of them and they hold about two-thirds of the population of the Strip. In the midst of these realities, foreign investors and developers are—as a priority—building a Marriot hotel on a relatively large piece of fertile land, which is badly needed to farm and to live on.

The second major disruption of the space in which Palestinians live is taking place now, when we are imprisoned in small closed areas called “self-rule” areas, where we are confined and restricted in terms of building the environment we inhabit. I am talking about a place like Ramallah, the town in which I currently live and work, where what is being built—which is referred to as *development*—is drastically changing the place into a messy expensive disorder. In a very real sense, the construction which is taking place outside us is strongly connected to the destruction which is taking place inside us, at the level of the fragmenting our inner selves, souls, and minds. Whether it is the new layout of the town or the internal design of the buildings, the newly-built environment is creating disruptions in our lives which I believe will affect us in ways more subtle and yet more drastic than the 1948 disruptions. Between 1948 and 1993, for example, Palestinians lived in constant defiance of the imposed environment. In contrast, the new forms of the built environment are welcomed by Palestinians. The real impact will only become clear when it is probably too late. Again, what do the international developers choose to start with? The first project which the World Bank executed in Ramallah was the removal of the old and beautiful and lasting sidewalks made of stone slabs (which were brought from the quarries around Ramallah), replacing them by new ones made of mixed gravel, which is brought from Israeli factories and which does not last as long!

As in almost all other cases, the way Palestinians tradi-

tionally built their homes reflected and embodied many positive aspects: a maximum efficiency in terms of heat-saving (thickness of the walls, for example), good ventilation (the way openings were placed), an aesthetic and a utility in harmony with the natural surroundings (It is interesting to mention here that Israelis who live in old Arab homes boast about the fact!) Also, as has happened in many other regions around the world with so-called development projects, this beautiful habitat is being increasingly destroyed and replaced by alienating and box-like buildings. Palestinians are contributing their share to this proneness to destruction and replacement. Somehow Palestinians seem to have been unaware of the effects of the way Israeli settlements are built around them and in their midst. The new way in which Palestinians build may very well unconsciously reflect an attempt to imitate the way the dominant society builds (a phenomenon which Paulo Freire talks about in some detail in his book, *Pedagogy of the oppressed*). The high visibility which the new buildings possess could be another reason why Palestinians are building in such an alienating way: visibility rather than harmony is becoming a governing value. Compared to traditional Palestinian towns that grew naturally over a long period of time and, thus, were in harmony with nature, Israeli settlements are built in a hurry, mostly for political and ideological reasons; they are in a sense “dropped” on the ground from above. (This is often the way they are in fact constructed: ready-made walls and roofs are brought by huge trucks and dropped from above by cranes!) Similarly, it seems, in their hurry to make a counter-argument and create an impression, Palestinians have been abusing the place through the built environment during the past three years. The new way of building—in human terms—is cold and alienating, to say the least. When I stand on a hill where I can see an Israeli settlement and a Palestinian village at the same time, I cannot but record the settlement as a wound in the landscape and the village as a decoration that fits well within it.

A home, whatever shape it takes, is primary and fundamental in bringing order and harmony to one’s life. A lack of harmony and beauty affects people’s thinking, perceiving, and relating to one another, as well as increasing the alienation many feel towards their surroundings.

What I am trying to say here is that the built environment is having a drastic impact on us and thus should not be ignored or marginalized in our curriculum. Aspects of our life such as the impact of the built environment are more subtle and less visible than other dangers we face and, thus, may be the more dangerous. They are rarely, if ever, talked about. They need to be brought to the surface through becoming part of the Palestinian curriculum as well as the focus of public discussions. The teaching of math is well suited for this purpose.

An increasing number of books and writers point to the profound importance which dwelling has for us. Norman Crowe, for example, quotes Martin Heidegger: “To build [is] to nurture ... It is the act of dwelling that makes us what we see ourselves to be: human.” He continues quoting him: “Since the fundamental character of dwelling is one of nurturing, the concept of the duality of man and

nature as separately distinguishable entities is resolved through this fundamental and continuous act—the act of dwelling—which is building and nurturing”. [1] Among Palestinians, Najwa Makhoul is probably the only one who has written and contributed profoundly in other ways to discussions at an international level concerning the impact of the built environment on human beings. I owe much of my awareness in this regard to her.

Dwelling is what connects us as human beings to nature. To build and nurture is one way to enter into a “dialogue” with nature, it is this that creates peace within us, which is obviously not an insignificant factor in bringing about peace around us.

The point I want to make here is the following: in spite of the tremendous impact which the built environment has had on us during the past 50 years, the issue has never been a concern to Palestinian mathematicians or to math teachers and educators! What medium would be more suitable than math for helping us understand our relationship with the space we inhabit and so help bring sense, harmony, and sanity into the lives of the people who live in it? How can math go on claiming it is knowledge when it refuses to consider the issue of the use—or rather the abuse—of the place in which we live as a primary concern; when the issue of how we order the built environment is not a central theme in the curriculum?! No doubt math teachers and educators—like many others—are victims of an educational system which has assigned to them the task of implementing a ready-made curriculum and of testing students mainly on technical skills.

We cannot take this lightly. The lack of harmony in the built environment has a tremendous impact on our thinking, on our relationships with one another and with our surroundings, and even on the literary and artistic expressions we use to reflect our lives. The issue at least deserves to be a central one in our discussions and our educational institutions in particular. How can we as math teachers continue to claim that what we work with is knowledge when we don’t consider helping to make the creation of order in the mind and in the built environment a basic concern in our teaching?! What is the purpose of teaching geometry, in particular, if ordering the place in which people live is not one of our primary concerns?! There is so much arbitrariness in people’s lives due to imposed and oppressive restrictions on our movement and our use of space. The teaching of math could be doing some good, at least in this regard. After all, it is the subject that deals with systems, patterns, structures, and relationships; it is the subject we claim brings beauty, harmony, and order into our lives. It would make sense for a good portion of the Palestinian curriculum to revolve around this theme, at all levels. This is a part of what we could contribute to international debate in an increasingly interrelated world.

The way we build reflects the values which govern our thinking, our behaviour, and our expressions. A beautiful and powerful example of a way of looking at ourselves as creators—which I hold to be one of the core values in the teaching of math—is manifested by the built world, by how we use the elements in nature in order to build homes, neighborhoods, villages, and towns. It reflects the sense

and extent of the responsibility we feel towards ourselves, towards others (including future generations), and towards nature—another core value that should go into the teaching of math. The built environment also reflects a third core value: the connectedness among the various elements and aspects in life (connecting dwelling with nature, nurturing, family relations, politics, the processes of construction, and human perception). These three values—striving to see connectedness and wholeness; feeling responsible; and sharing in the continuous making of the world—are what I believe go into the making of human beings, of becoming better human beings, of exercising our humanity to the fullest. These are the values which I submit for consideration as the “guiding stars” of our teaching and learning of math (as well as of other subjects).

### **The movement of people**

As with the place we inhabit, the movement of Palestinians has been drastically affected. At the beginning of this century, for example, people were able to move without hindrance over the whole region referred to today as the Middle East. With the British and French occupation of the region, movement started to be restricted. When I was born, my father was still able, for example, to go from Jerusalem to Beirut or Damascus any time he wanted (he was a taxi driver). Today I can't go to Jerusalem although I live less than a 15-minute drive away, and although I was born there and love to go to it! Worse still: to travel between the northern and southern parts of the West Bank, Palestinians living in the West Bank have to go around Jerusalem. To go, for example, from Ramallah (where I live in the West Bank) to Bethlehem (also in the West Bank) I must follow a completely different path from the one taken by people (including Jesus) for 4000 years up until 1993—ironically, when “peace” was officially declared on TV, the peace we don't see on the ground! The new path—appropriately called the “valley of fire”—counters all the invariances we study and teach in math: it is almost three times the distance, takes three times the time, and costs more than three times the amount we used to spend before the “peace process”! The space in which we are allowed to move has been shrinking throughout the century, from the whole of the Middle East at its beginning to a confinement to the centers of our towns, and sometimes even to our homes, by its end!

Through the Tamer Institute I have distributed a number of math questions, one of which invited students to figure out part of the price of “peace” which we have been paying since 1993 (as a result of being forced to go around Jerusalem), and to compare that with, say, the “assistance” of the World Bank, which goes mostly to non-essential projects and is putting us in debt, probably forever. (Two officials from the World Bank asked me in April 1996 how they could help Palestinians. I said, “Use your influence to let us go through Jerusalem; then we won't need your help and we will thank you for ever.” I never heard from them again.) I asked students to work as teams in order to calculate how much it costs Palestinian people to go around Jerusalem. Isn't this type of question legitimate in the Palestinian curriculum? Like the built environment, the

movement of people raises questions that require the combination of various elements: estimating, taking action, reading maps, working with several interdependent variables at the same time, developing a sense of responsibility, seeing connectedness among various phenomena, seeing and suggesting options and alternatives, and working within teams. Isn't a theme this rich, which touches our daily lives and has an impact on our survival as a people—today and in the future—an appropriate theme?! Why should a topic like solving quadratic equations be part of the curriculum while the movement of people is not?! Why should triangles be a legitimate topic while the built environment is not?! Moreover, if we included these topics in the Palestinian curriculum, wouldn't math then become more interesting and meaningful? And under such conditions perhaps a concept like intelligence would become obsolete and distorting, and students' interests and involvement would become the factors determining their ability to understand!

### **More examples**

Another topic which I see as timely and relevant and, thus, should be included in the Palestinian curriculum is consumption, which characterises the new phase probably more than anything else. Unlike the previous themes (movement and the built environment), the theme of consumption is more within the power of Palestinians to deal directly with. For example, a group of young people in a Palestinian refugee camp with a population of 35,000 estimated in 1995 how much people in the camp spent per day/month/year on cigarettes. What they found out angered and frightened them, but at the same time created new options in their minds. They started a campaign among the inhabitants of the camp with the aim of channeling part of the cigarette money towards meeting some community needs. The addition of such a theme, an “internal” aspect, complements the external aspects of life in refugee camps, such as the ones I have mentioned above, and thus helps us see the bigger picture.

My basic argument here is that every curriculum should have — as part of its design — enough room to include the realities and personal experiences and expressions of the people following the curriculum as part of the on-going discussions in math classes. I have chosen examples and values that spring from the Palestinian context. Every situation and location has its own abundance of examples. All we need is a shift of mind and to activate our senses again in order to cut through the thick ideological layers which have accumulated over the years in our minds, hearts, and souls. By way of illustration, I will mention very briefly some examples.

In a country like the U.S., the issue of how many thousands of trees are used to produce the Sunday edition of a major newspaper could form an appropriate theme in the math curriculum; in El Salvador, questions arising from the shrimp industry; in Columbia, from the planting and exporting carnations; in the Dominican Republic, from the production of sugar cane; and so on. [2] All these examples have a tremendous impact on human beings and on ecology, in terms of depleting resources, habits of consumption,

the displacement of people, and on future generations in the respective countries. If such topics are not part or concern of the teaching of math, then I would like to raise the question again: is math in the classroom neutral, or is it dead?

## Conclusion

Some may look at the above discussion as far-fetched and outside the domain of teaching math. But in a world where trends take the form of monopolies on a world scale, and where globalization, polarization, and marginalization (of more than three-quarters of the world's population) are becoming increasingly embedded in the dominant structures, we cannot afford — not in our teaching of math nor in any other activity — to be blind or remain content with small and narrow dreams.

More than in any other age in history, humanity today is in real danger. The onslaught of TV on children's lives at a very early age is a relatively new phenomenon in human history and it embodies an extremely dangerous trend which we don't seem to be equipped to deal with. Knowledge today is so fragmented that wholeness is almost always lost; people don't even bother to look for it. We are increasingly losing a sense of responsibility, not only towards others and towards nature but also towards our own children and even to ourselves — just look at what we eat, what we care for, and what we watch! Diversity is a major victim of current trends; out of about 5,000 languages that were used at the beginning of this century, for example, only about 100 are still in practical use today. Cultures are melting into one tasteless universal consumption culture. Technology and modern science have accumulated enough nuclear bombs to destroy the world ten times over but hasn't the power to recreate it once! Someone once said, "We are much too clever to survive without wisdom." We need to have big dreams again and to have room for wisdom again; we need to see wholeness and connectedness in life, to feel responsible, and to share in the continuous making of the world. Nothing short of humanity's future is at stake!

We cannot afford to go on teaching math (or any subject for that matter) in a neutral and aloof way, insensitive to the realities in which people live. And we cannot achieve relevancy through examples that are superficial and uninspiring, usually referred to in math textbooks as "applications". Change, as usual, will probably not come from the top, where people usually feel comfortable, but from people in the midst of life, such as teachers and students.

We seek knowledge in order to see wholeness, to make sure that our sense of responsibility is not misguided, distorted, or misinformed, and in order to be significant contributors to the making of the world. We seek knowledge to exercise the human and the divine in each one of us: we become creators in a way which is responsible to the whole, including the rest of nature and other human

beings. Everyone has a worldview, whether s/he is conscious of it or not. The role of knowledge is not to replace such worldviews in people's minds by ready-made ones but to contribute to them in a way which enriches them and makes them more satisfying to the person and more harmonious with nature. In this sense, limiting math to learning technical skills or tricks is totally unjustified, and has to end. In some situations, like the Palestinian one, this shift in perceiving and teaching math is crucial to survival. Obviously in order to see the whole we need sometimes to step back and look at the situation from various perspectives and viewpoints in order to challenge our perceptions, including the dominant one, and to create alternatives in our imaginations.

The neglect of nature, experience, and reality has been a major underlying reason for many of the problems we encounter in the teaching and learning of math. Packaging this neglect in a language which is full of high-sounding descriptors such as neutral, universal, abstract, and requiring high intelligence, will continue to make things worse — even harmful. How many people do we know, for example, whose self-esteem was destroyed because of such claims concerning math?!

When we talk about developing a Palestinian curriculum in math, we should not mean duplicating what others have (with merely a change of the cover page) or adding some artificial or superficial "local" examples to our textbooks. The Palestinian curriculum — if this terminology is to be meaningful — should be built on aspects and issues of the Palestinian reality that may appear in other places but are striking in the Palestinian context. The topics in textbooks should reflect the realities in the country rather than only technical matters. This is the meaning to having a curriculum which is authentic and universal at the same time — in every country and every location! Then we would contribute to pedagogical discussion around the world instead of remaining imitators only. If we, as Palestinians, don't contribute to the teaching of math, worldwide, in aspects such as the purpose of teaching it, the values associated with it, in areas such as movement and our relation to the places we inhabit, we will have lost a golden opportunity to be good teachers and good learners.

## Acknowledgement

I would like to thank Fadia Harik for reading a first draft of this article and making very valuable suggestions.

## Notes

- [1] Norman Crowe, *Nature and the Idea of a Man-Made World*. Cambridge, Mass.: MIT Press, 1995.
- [2] I thought of these examples as a result of listening to a very moving series called "Vanishing Homelands," produced by Homelands Productions of Tuscon, Arizona.