

# Can Mathematics Educate for Peace?

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## Abstract

This paper deals basically with what are our collective priorities for peace in society? How deeply related are mathematics and peace? War does not just kill people. It destroys roads, bridges, farming equipment, telecoms, water and sanitation systems. Survival of mankind, with dignity for all, is a most urgent and universal problem in this situation. The Program Ethnomathematics is a response to this crime, terrorism, and wars, and maintenance of world peace on a permanent basis. Savannah Yates rightly remarked that “Mathematics may not teach us how to end world hunger, create world peace or fix a broken heart. But it does teach us that every problem has a solution.”

**Keywords:** Priorities, equipment, survival, mathematics

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## Introduction

**Savannah Yates quotes**, “Mathematics may not teach us how to end world hunger, create world peace or fix a broken heart. But it does teach us that every problem has a solution.”

We are witnessing an environmental crisis, disruption of the economic system, institutional erosion, mounting social crises in just about every country and, above all, the recurring threat of war. And now, after the terrorist attack, near the marathon’s finish line in Boston Marathon 2013 on April 15, 2013, the attack on Taj Hotel in Mumbai on November 26, 2008, the attacks on the World Trade Centre twin towers in New York and Pentagon in Washington on September 11, 2001 and many other attacks, the uncertainties are a real threat to our mental and emotional equilibrium. We are anxious about the next minute and we look with fear and suspicion at our neighbor. A scenario similar to the disruption of the Roman Empire is before

us, with the aggravation that the means of disruption are, nowadays, practically impossible to control. Survival of mankind, with dignity for all, is a most urgent and universal problem.

Everybody desires peace - harmony and balance forming comfortable life for themselves, family, communities and ultimately society. Yet every person’s individual ideal of peace varies. Often it is dependent on their environmental conditions. For example a person growing or surviving in a conflict zone may desire shelter and protection from violence; an Indigenous tribe forced to flee their homes due to commercial logging may desire preservation of their natural habitat. A person in an abusive, violent relationship may desire a refuge and means to relocate.

We have a contemporary, expanded definition of ‘peace’ that encompasses and extends beyond human security. We understand poverty alleviation helps societies minimize crime, sickness and violence. We value the benefits of peace

prevention diplomacy and mediation as we do the peace building strategies of disaster aftermath - new ways forward.

Yet what are our collective priorities for peace in society? Is it individual tranquil, prayer and meditation? Good neighbor relations? Giving our children a pristine clean environment to grow in with minimal threat?

But if there is no development without peace, there is also no peace without development. War does not just kill people. It destroys roads, bridges, farming equipment, telecoms, water and sanitation systems. It burns hospitals and schools. It retards trade and economic life, or completely halts it. War tears asunder the fabric of society and creates havens for international terrorists. So the first prerequisite of sound development is preventing war in the first place.

Peace must be understood in its multiple dimensions:

- Inner peace
- Social peace
- Environmental peace
- Military peace.

Excerpts from an announcement in the world press, 23 September 2001: Maharishi's Proposal for Permanent World Peace: A respectful open letter to President Bush, the leaders of Congress, and the philanthropic, wealthy, peace-loving citizens of the USA and the world.

According to MaharishiMahesh Yogi- Today we must wake up in our wisdom and take recourse to a more effective approach, which will be better than the two approaches that have failed to achieve peace:

1. Negotiations, and
2. Use of destructive weaponry

It is clear that political negotiations, treaties, and the use of arms have never succeeded in creating a lasting state of world peace.

### **What is the way out of this predicament?**

**Maharishi** says: 'Only a new seed will yield a new crop. Only a new philosophy and new efforts based on new knowledge will fulfill the age-old dream of the wise for prevention of crime, terrorism, and wars, and maintenance of world peace on a permanent basis.'

It is obvious that world peace will be fragile if the element

of relationship between nations is based on the man-made concepts of peace and harmony—negotiations to change the moods and whims of nations—as has been the case with the concept of the United Nations and all other so-called well-meaning organizations. The knowledge and experience of total Natural Law, which invincibly governs the infinite diversity of the ever-expanding universe, provides the answer.

A new world order is urgently needed. Our hopes for the future depend on learning—critically—the lessons of the past. We have to look into history and epistemology with a broader view. Matheracy is the capability of inferring, proposing hypotheses, and drawing conclusions from data. The program Ethnomathematics contributes to restoring cultural dignity and offers the intellectual tools for the exercise of citizenship. It enhances creativity, reinforces cultural self-respect, and offers a broad view of mankind. In everyday life, it is a system of knowledge that offers the possibility of a more favorable and harmonious relation between humans and between humans and nature (D'Ambrosio 1999a).

The Program Ethnomathematics is a response to this crime, terrorism, and wars, and maintenance of world peace on a permanent basis.

### **The Program Ethnomathematics**

A realization of this new concept of curriculum is the Program Ethnomathematics.

To build a civilization that rejects inequity, arrogance, and bigotry, education must give special attention to the redemption of peoples that have been for a long time subordinated and must give priority to the empowerment of the excluded sectors of societies.

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The Program Ethnomathematics offers the possibility of harmonious relations in human behavior and between humans and nature. it has; intrinsic to it; the ethics of diversity:

- Respect for the other (the different);
- Solidarity with the other;
- Cooperation with the other.

Of course, the Program Ethnomathematics was initially inspired by recognizing ideas and ways of doing that reminds us of Western mathematics. What we call mathematics in the academia is a Western construct. Although dealing with space, time, classifying, comparing, which are proper to the human species, the codes and techniques to express and communicate the reflections on these behaviors is undeniably contextual.

It is important to insist that the Program Ethnomathematics is not ethnic mathematics, as some commentators interpret it. Of course, one has to work with different cultural environments and, as ethnographers, ethnomathematicians try to describe mathematical ideas and practices of other cultures. This is a style of doing ethnomathematics, which is absolutely necessary. These cultural environments include not only indigenous populations, but labour and artisan groups, communities in urban environment and in the periphery, farms, and professional groups. These groups develop their own practices, have specific jargons and theorize on their ideas. This is an important element for the development of the Program Ethnomathematics, as important as the cycle of knowledge and the recognition of the cultural encounters.

Basically, investigations in Ethnomathematics start focus three basic questions:

1. How are ad hoc practices and solution of problems developed into methods?
2. How are methods developed into theories?
3. How are theories developed into scientific invention?

The Program Ethnomathematics is a proposal to demystify mathematics, by showing that the human mind acts mathematically when facing new situations and problems posed by the real world. This program tries to explain mathematics, as it tries to explain science, religion, culinary, dressing, football and several other practical and abstract manifestations of the human species.

### **The Use of Mathematics in Order to Contribute to Peace**

The following possibilities to use mathematics in order to contribute to peace can be identified in the contributions:

1. Mathematical topics can be taught in such a way that they contribute to values education (for example Boyles' law and tolerance, Rottoli)
2. Mathematical modeling or analyses of peace or conflict situations can
  - lead to a better understanding of situations and their dynamics – and thus to insight into chances or the impossibility to avoid escalation
  - demonstrate that, in some cases, a mathematical model can lead to wrong or morally unacceptable conclusions making students aware that there are situations where decisions must not be based on mathematical considerations alone (Emmer, Scarafiotti/Giannetti)
3. Mathematics can be used to expose dangerous trends thus leading to the insight that counter-measures are badly needed (Fasheh)
4. Mathematics itself can be part of the basis on which to build a “better” world (Fasheh).

**Michele Emmer** in *The mathematics of war starts from the* – rather negative – image of mathematics drawn in newspaper reports on war as well as in a novel also dealing with war and contrasts this with a teacher manual where mathematics is seen as one means to offer several paths to peace education. Anna Rosa Scarafiotti and Annarosa Giannetti – identifying “positive” peace with the mathematical concept of balance – suggest the study of dynamical systems and of fractals. Students thus may recognize the need for punctilious attention to maintain a balance situation and for careful analysis and continuous check of those parameters which control the system and keep it in a state of “peace”.

It is clear that mathematics is well integrated into the technological, industrial, military, economic, and political systems and that mathematics has been relying on these systems for the material bases of its continuing progress. It is important to look into the role of mathematicians and mathematics educators in the evolution of mankind, especially because mathematics is recognized as the most universal mode of thought.

Thus it is appropriate to ask what the most universal mode of thought-mathematics-has to do with the most universal problem-survival with dignity (D'Ambrosio 2001). Today

there is a need to find the relation between these two universals is an inescapable result of the claim of the universality of mathematics. Consequently, mathematicians and mathematics educators should have to reflect their personal role in reversing the current world situation.

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