

BUILDING THE SCIENTIFIC MIND

FINAL REPORT
OF THE
ADVANCED INTERNATIONAL COLLOQUIUM
HELD IN
THE HAGUE, THE NETHERLANDS
MAY 17-20, 2005



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INTRODUCTION

The Advanced International Colloquium on Building the Scientific Mind - BtSM2005 for short - was held at the [Institute of Social Studies](http://www.iss.nl)¹ (ISS) in The Hague, The Netherlands, from 17 to 20 May 2005. The colloquium was organized by the [Learning Development Institute](http://www.learndev.org)² (LDI) and took place under the patronage of the [United Nations Educational, Scientific and Cultural Organization \(UNESCO\)](http://www.unesco.org)³. It was officially opened, on behalf of UNESCO's Assistant Director-General for Science, Walter Erdelen, by the Chair of the National UNESCO Commission in The Netherlands, Lieteke van Vucht Tijssen.

The colloquium was deliberately organized to fall in the year 2005, the [World Year of Physics](http://www.wypp2005.org)⁴, celebrating the publication of Einstein's seminal 1905 papers in the *Annalen der Physik*. This commemorative context did not fail to draw attention to the work of the colloquium. Thanks to the continual presence at the event of Radio Netherlands and Radio Romania, BtSM2005 received ample attention in the media.

It was also felt to be particularly appropriate that the colloquium took place in a country that would not even have existed had humanity not developed the state of mind that allowed it to change the parameters imposed by nature and create land where there should have been sea.

Moreover, the Institute of Social Studies, in collaboration with which the

colloquium was organized and at whose premises it took place, provided a most adequate setting for the event. ISS is a renowned transdisciplinary research and training institution with a strong focus on international development issues and with students and faculty from around the world. In a context in which science is often exclusively identified with the physical and life sciences, the setting of ISS was an important factor in allowing the BtSM2005 participants to appreciate the integrity of human knowledge, across the boundaries that separate historically created artificial divisions. Such boundaries become more and more a hindrance as the problems the world is facing require increasingly transdisciplinary approaches.

Organizing the colloquium was part of the Learning Development Institute's [TSM \(The Scientific Mind\) focus area](http://www.learndev.org)⁵. The idea to organize such a meeting dated back almost to the inception of the Institute. A [preliminary draft concept paper](http://www.learndev.org)⁶ on the theme, written with a different organizational context in mind, is still available on the www.learndev.org Web site under the focus area "The Scientific Mind (TSM)".

Further detail about the colloquium itself, supplementary to this report, can be found on the [BtSM Web page](http://www.learndev.org)⁷. The same page contains links to the various intellectual contributions made by the participants in the form of papers, PowerPoint slide shows, and sound files.

¹ [http://www.iss.nl/](http://www.iss.nl)

² <http://www.learndev.org>

³ <http://www.unesco.org>

⁴ <http://www.wypp2005.org/>

⁵ <http://www.learndev.org/SciMind.html>

⁶ <http://www.learndev.org/dl/TSM-ConceptPaper.pdf>

⁷ <http://www.learndev.org/ColloquiumBuildingTSM2005.html>

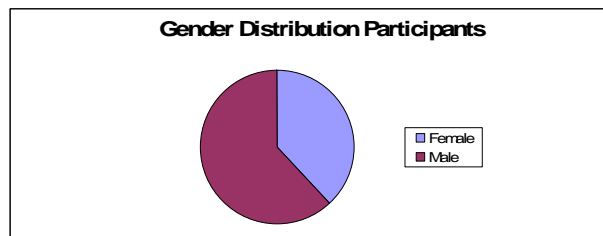
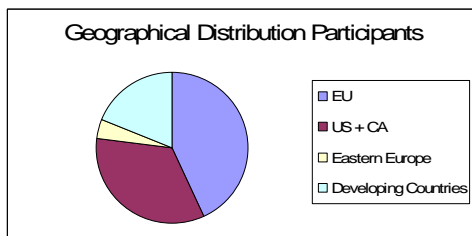
PARTICIPATION

A total of 50 people participated in BtSM2005 and represented a wide variety of disciplines. Their ages ranged from 7 to 82 years old. Of the total of 50 participants, 48 were physically present. Two persons participated via teleconferencing, one of them extensively.

As the pie chart below illustrates, the large majority of participants (77%) came from the European Union (43%) and the USA and Canada (34%). Almost one fifth of the participants came from developing countries (19%) and 4% came from Eastern Europe. For a colloquium that has the word 'scientific' in its title, it was interesting and

encouraging to find that almost 40 % of the attendees were female (see below).

Annex 1 provides a list of the BtSM2005 participants, including the countries they represented and their affiliations. Profiles of many of the participants can be found in the [BtSM Community section of the BtSM Web page](#). In addition to the 50 persons who actually participated, there are those who had wanted to be there, but who couldn't and who asked to be kept in the loop for further developments. The actual BtSM community is larger than the group who was able to make it to The Hague. The involvement of this larger community will be sought in post-BtSM2005 activities.



RATIONALE

In the lead-up to the colloquium, the following reasons were identified why it should be held.

First, societal efforts focusing on human development, such as through the various school systems, have long been biased towards merely making people more competent, allowing them to acquire all kinds of narrowly defined

skills that can easily be measured on tests and exams. Far less attention has gone to ensuring that competent people develop the disposition to use their competencies in ways that are mindful. There is thus an increased risk that the ever greater ability of humans to intervene in their environment is insufficiently guided by the more comprehensive frames of mind

humanity developed while the species evolved culturally. The referred risk becomes more threatening, the greater the potential impact single individuals or small groups of people are able to have on their environment through their specific action or failure to commit to action. It is therefore important to complement the development of competence with the simultaneous development of mind. It is noted in this connection that learning requires conceptual as well practical experiences. The school environment tends to favor the former to the detriment of the latter, leading to fragmentation rather than integration. For instance, although mathematics and philosophy are intimately related and interdependent, it appears as if they can be studied and learned without reference to each other. This affects teachers and students. The former cannot map out the richness of interrelated intellectual and practical pursuits and learners cannot link their entire experience into something approaching a holistic overview. This has profound implications for models of mind and consciousness, since learning is at the root of the definitions one can make of mind.

Second, for the purpose of the colloquium in question, the mind was defined as the interconnected set of attributes of the whole person that disposition the beholder to approach his or her world in particular ways. In this context, mind is seen as an embodied process that allows humans to use language and speech to engage with the world. Humans normally entertain a variety of mindsets. The scientific mind is part of that variety. Examples of other mindsets are the artistic mind, the entrepreneurial mind, the spiritual mind, the political mind, the moral mind. People typically adopt a particular frame of mind and consider problems they encounter in the light of it. They are also

able to switch between different views of the world and may at one time be inclined to view an issue in, say, a political perspective and subsequently want to address it inspired by a scientific mindset. An assumption behind the Advanced International Colloquium on Building the Scientific Mind was that the scientific mind provides a key perspective that in essential ways complements the various other mindsets. In other words, it is a mindset that everyone should have.

Third, an important respect in which the scientific mind has shown to be of great value can be gleaned from how the community of scientists has frequently succeeded to retain its cohesion in the face of serious divisions between large groups of nations. Developing the mindset that drives scientists to work together despite differences also in people who do not engage in formal scientific activity must be assumed to have a beneficial impact on humanity's ability to live together in harmony. I.e., the scientific mind is one of the ingredients for a more peaceful world. This is not to say that the picture is entirely rosy. Taking the functioning of the scientific community as a starting point, it was felt that discussion should equally focus on aspects such as the involvement of scientists in the building of weapons of mass destruction.

Fourth, economic growth and human development in the Third World are crucially dependent on familiarity of the populace with ways of thinking and interacting with problems that pertain to the scientific mind. Traditional school science education, based on curricula and assessment procedures that emphasize rote learning of compartmentalized knowledge, is frequently an insufficient condition for the proper development of the scientific mind and may at times be at odds with it. Refocusing school-based learning

towards attaining the various attributes of the scientific mind is thus particularly relevant for the developing world.

Fifth, the development of mind, including the scientific mind, is a function of people's participation in a variety of learning contexts. The school is one of those contexts as are the opportunities for human growth offered by, for instance, the family environment, museums, circles of interest, the broadcast media, and virtual exchanges via the Internet. In terms of societal intervention to promote human learning these environments are normally

considered in isolation of each other. Moreover, the school context is often singled out as the almost exclusive area for societal intervention in human learning. However, in the context of mind development, it is important that the bigger picture be seen and thus that coherence and mutual reinforcement be sought between the various learning environments. It is equally important that a better balance be found between attention to learning in formal structured contexts and in non-formal and informal contexts that are often less structured and leave a greater role to the initiative of the learning individual.

AIMS

The overall goal of the Advanced International Colloquium on Building the Scientific Mind was to impact profoundly existing policy, practice and research in areas pertaining to building the scientific mind. It aimed therefore specifically at:

1. identifying important dimensions and attributes of the scientific mind, from the holistic perspective expounded above;
2. determining the conditions that foster development of the scientific mind in multiple, both formal and informal settings;
3. establishing practical ways to improve and complement existing implicit and explicit efforts to develop the scientific mind;
4. seeking to approach the development of the scientific mind in a coherent manner, exploring the potentialities of multiple learning settings and moving beyond mere disciplinary approaches; and
5. paving the way to innovative interdisciplinary and transdisciplinary research in hitherto uncharted terrain regarding the above issues.

PROCESS AND PROGRAM

The advanced Colloquium on Building the Scientific Mind was organized around significant themes determined by the International Program Committee, which contemplated

prospective participants' declared interests and paper proposals that progressively came in as the dates of the event approached. Following is a list of areas drawn up at an early stage to

serve as attractors around which program activity could be grouped. The list turned out to serve exceedingly well as a basis for the conception of the final program.

- Building the scientific mind for a developing world. A group had already been formed prior to BtSM2005 that wanted to work on this theme during the colloquium.
- Establishing the conditions for a more peaceful and harmonious world by spreading the spirit of science.
- Biography of the scientific mind (focusing on documenting the scientific mind in action so as to reveal its multiple dimensions and attributes). The activity was already underway before BtSM2005. Work during the colloquium intended to build on the results of the pre-conference efforts.
- The brain and the scientific mind. This theme intended to explore the challenge of building the scientific mind from the perspective of our increasing knowledge about neurophysiology and how the brain develops.
- Early child development from a neurophysiological perspective is a specific focus within the above area.
- The scientific mind in the context of alternative mindsets with specific attention to how the scientific mind interacts with other mindsets that people entertain and how they deal with apparent contradictions and ambiguities.
- The media and the scientific mind.
- The crucial interaction between creativity, artistic spirit and scientific investigation in the formation of the scientific mind.
- The role and importance of science writing and science journalism for the development of the scientific mind.

- Learning from the best experiences so far. This could include, for instance, a thorough and critical look at work undertaken by Harvard's Project Zero, the Illinois Math and Science Academy, Museums such as the Exploratorium or the Cité des Sciences et de l' Industrie in Paris, TV shows such as Nova, radio shows such as Science Friday, and Internet sites such as www.kennislink.nl.
- Health related behavior (particularly as regards HIV/AIDS) and the scientific mind was added to the above list at an advanced stage of organizing the colloquium. Of all the special interest groups that were formed, it attracted the largest number of participants. A separate report is forthcoming on the work performed by this group.

The program conceived on the basis of the above concerns is presented in Annex 2 to this report. It consists of six different strands of activities that run throughout the four-day program.

The way the program was set up and executes, allowed all participants to be exposed to everything their colleagues of other disciplines were exploring. This led to a rich exchange between the disciplines as well as to debate on issues – such as values and ethics – that transcended the notion of discipline.

Throughout the four days of the colloquium, there was a constant mixing of opportunities to be informed through plenary presentations and debate and to discuss what one had been exposed to in the more focused context of small thematic groups or special interest groups. In turn, the results of such group work were fed back on several occasions into the process of plenary sessions. The sound files of the colloquium, available on the [BtSM Web](#)

[page](#), provide testimony of the richness of debate to which this process was able to lead. It also was a very effective mechanism for the emergence of new networks and friendships.

Spontaneous comments (received via email after the conclusion of the colloquium) speak for themselves. Following is a small bouquet of what was said:

- *A very good experience.*
- *A stimulating conference [that] got my scientific mind thinking. (Actually, I think it has got the bits of my mind that I didn't think were scientific thinking more.)*
- *What a great workshop it was! I am delighted that I was able to attend this meeting. I learned a great deal, more than I had expected and also made new friends in the process.*
- *It was such a privilege to have the space and freedom to interact with such a diverse and interesting group of people.... I found it very creative and have already started to pass on links and information to other colleagues. [I] returned...with many new ideas and projects to pursue.*
- *I came home full of the excitement of having made connections with like-minded people working toward the betterment of the world through all kinds of venues. I can see myself*

potentially participating in several of the initiatives presented....

- *We enjoyed the ideas, stimulation and people immensely.*
- *It was a smart gathering.*
- *The SMS (Sci. Mind Set) has already proved a useful component for teaching complex material to medical students who I mentor and who had to develop a multi-year study plan. The visualization of scientific material as a more appropriate means of teaching scientific material to girls presented at the conference was indeed seen as useful by the female students. "Visualizing scientific information" should be a key ingredient of the concept in order to get both sexes up to speed with the SMS since it cuts across gender differences in learning style.*
- *Many many thanks for the fantastic meeting! It was really a great experience.... Among the valuable outcomes for me are the prospects of two translations - an Arabic translation of my anti-war book and a Spanish translation of "Science and Society."*
- *Indeed, it was a learning experience for me to meet all these experienced people, and interact with them in BtSM. I shall try and join in the e-sharing activities of BtSM as soon as I am back from my field trip in December '05.*

COMMITMENTS TO CONTINUING THE INITIATIVE

In this final section of the report we summarize participants' ideas on how to move this initiative forward. Below is a summary of the commitments and suggestions that were made. A strong call was made for ensuring that these

commitments are not only based on individual interest but also become part of the institutional frameworks of which BtSM community members are part.

Continuing the dialogue among the BtSM community

The overall feeling of the meeting was that the Colloquium had provided a unique opportunity to engage in a critical discussion across disciplines and boundaries. Participants stressed the important role that the BtSM meeting had played in fostering partnerships among individuals and institutions and expressed a strong desire to ensure that this kind of dialogue and collaboration will continue and become part not only of an individual commitment but also of an institutional interest and engagement.

It was agreed that the blog⁸ that was set up by Ron Burnett during the BtSM Colloquium and the wiki⁹ created by the Networking Group will be key forums for furthering such discussion. Both will be linked to the LDI website. In addition, there are strong indications (see also below) that various partnerships and initiatives have formed during the meeting which will continue. Those that are engaged in these initiatives are invited to share their experience with LDI, the BtSM community at large, and to make them available for posting on the LDI website.

Extending the dialogue to other levels

Participants from four countries – India, Mexico, Mozambique and Russia – expressed their intention to extend the dialogue around the importance of the scientific mind to their countries and regions. The focus will not necessarily be

on a replication of what took place in The Hague but rather on generating locally relevant and specific dialogue around this issue.

Evgeny Patarakin will be keeping in touch with LDI in the coming months on how to move this process forward for Russia. Gilles Lavigne of the Universidad Autónoma de Baja California in Mexico intends to organize a series of workshops and discussions with students. In the case of Mozambique, Paula Monjane of the Fundação para o Desenvolvimento da Comunidade will initiate the dialogue with the Ministry of Science and Technology to organize debate around this topic. Finally, Mohsen Tawfik will be moving the initiative forward through a meeting in India in August 2005. BtSM community members who are interested in participating in this meeting in India are more than welcome to attend.

It was agreed that the BtSM community would be kept informed of progress in extending the dialogue to these countries. LDI committed itself to supporting that process and to making the processes and products of BtSM 2005 available as an input to start country level reflection and discussion.

Disseminating the process and results of the BtSM meeting

There was a strong call for disseminating to a wider public not only the outcomes of this meeting but also a critical assessment of the processes that participants engaged in. The following concrete suggestions were made:

- Producing and circulating among the BtSM community and others a short and attractive summary document of the meeting. Katherine Nielsen agreed to collaborate to doing this by producing a short piece based on her synthesis intervention on the last day. The main purpose of this document will be to create awareness of what has been

⁸ Definition according to the wikipedia: "A weblog, web log or simply a blog, is a web application which contains periodic posts on a common webpage. These posts are often but not necessarily in reverse chronological order. Such a website would typically be accessible to any Internet user. The term 'blog' came into common use as a way of avoiding confusion with the term server log." (<http://en.wikipedia.org/wiki/Blog>)

⁹ The wikipedia defines 'wiki' as follows: "A Wiki or wiki is a website (or other hypertext document collection) that allows users to add content, as on an Internet forum, but also allows anyone to edit the content. 'Wiki' also refers to the collaborative software used to create such a website." (<http://en.wikipedia.org/wiki/Wiki>)

achieved so far, to generate interest for the initiatives that the BtSM community intends to move forward and to provide feedback to the “wider” BtSM community (i.e. those that had wanted to participate but were unable to do so or who may become aware of BtSM only now).

- Publishing the papers produced by various participants and groups in the form of proceedings of the BtSM meeting. The offer by Frederico Mayor of the Culture of Peace Foundation to support the publication of the proceedings in English and Spanish was gratefully acknowledged and the BtSM community will be asked to contribute to finding ways to distribute the proceedings and other publications to relevant audiences.
- Producing short and critical reflection pieces on the work done by each of the special interest groups and disseminating this to relevant audiences, both in print form and on the Internet. This will provide a valuable input into future meetings of this kind and has immediate relevance for those members of the BtSM community who intend to initiate similar processes at the level of their countries.
- Disseminating information about the discussions at the meeting through the media. Radio Netherlands has meanwhile produced a thirty minute radio program and a written account on the Colloquium. In addition, Laura Durnford of Radio Netherlands offered to establish connections between the BtSM community and the Science Communication studies people at Imperial College in London as well as those in Italy who helped organize the SCIRAB conference, which brought together science radio broadcasters from across Europe who met for the first time ever last year¹⁰.

¹⁰ See <http://www.scienceonair.org/index.htm>

- Reorganizing the LDI website so as to give prominence to the BtSM initiative and to make it possible to do justice to the overall concept and to the different thematic areas that have been formed during the meeting.
- Considering the potential importance of fostering and nurturing the scientific mind as a contributing factor to humanity’s ability to live in harmony with itself and the rest of the universe, it was decided to start a new focus area of activity at LDI called [Learning to Live in Harmony](#)¹¹ (LLH). John Avery of the Ørsted Institute in Copenhagen, who participated in BtSM2005, will coordinate the area.

Continuing and building upon the work of the special interest groups

A number of special interest groups met during the meeting and some of these intend to move their discussions and collaboration forward into the future. These are summarized below.

Science workbooks¹² for a developing world

The discussions among the group and the wider BtSM community resulted in agreement among those present on doing the following:

- Providing support to the process of field testing the materials. The Illinois Mathematics and Science Academy (through Christopher Kolar) has agreed to serve as a testing site. Tania Vergnani of the University of the Western Cape offered to explore the possibilities for finding a testing site in Africa. Paula Monjane will do the same for Mozambique.

¹¹ <http://www.learndev.org/LLH.html>

¹² See <http://www.learndev.org/ScienceWorkBooks.html>

- Involving students of instructional design courses (to be facilitated by Gordon Rowland of the Roy H. Park School of Communications, Ithaca College and Yusra Visser of the Learning Development Institute and Wayne State University) in the process of reviewing and formatively evaluating the modules.
 - Involving students in graphic design (to be facilitated by Ron Burnett, Emily Car Institute of Art & Design) in the lay-out and illustration of the modules.
 - Finding ways to ensure that the work of Elise Boltjes of the Noordelijke Hoogeschool in Leeuwarden is reflected in the content and design of the modules.
- this among the group and the wider BtSM community. Depending on the form this product takes it may also be distributed to other fora.
 - Finalizing the research questions that were generated in the course of the group work (which are the synthesis of the discussion about areas that the group does not know enough about) and circulating those to the broader BtSM community for comments and suggestions.
 - Exploring ways, through the partnerships that developed in the course of the meeting for moving forward the ideas and research questions that emerged from the group discussion.

In addition, members of the BtSM community were asked to stay in touch and to provide suggestions on ways and means for ensuring a wide distribution of the materials. Diana Stirling agreed to continue to provide an active input into the group.

HIV/AIDS and the scientific mind

A variety of spontaneous partnerships emerged from the critical discussion among the group on HIV, which are expected to move forward both the discussion and the process of critical inquiry into what we do not know about the possibly critical role played by the scientific mind in the prevention in HIV/AIDS. Key areas around which such partnerships are expected to evolve include teacher training, the challenge of moving the HIV/AIDS discourse into the public domain and the role of the media in this respect, a critical analysis of partnerships and the difficulties of establishing trust, and issues related to power relationships between different parties involved. In addition the group intends to work on the following concrete outcomes:

- Producing a short paper reflecting the discussions of the group and circulating

The networking group

The networking group came together around an initiative that started around two years ago to generate learning environments based on the principle that knowledge is constructed in collaborative environments with everyone participating equally. The intention is to find ways to extend the initiative to students and professionals who are committed to fostering and experimenting with such environments and who are willing to share their experiences through the Network Universalis publication. An appeal was made by Chide Groenouwe (c.n.groenouwe@gmx.net) to the BtSM community to suggest possible collaborators (the current group has four core members and three supporting members from a variety of disciplinary backgrounds). It was suggested that LDI send out an e-mail in the coming week or two to remind participants to provide suggestions.

Other groups

The group on critical thinking and the synthesis group on the mapping of the scientific mind did not advance concrete ideas during the summary reporting

session on how to move their interaction forward beyond the BtSM meeting.

The group on critical thinking, did, however, emphasize the overriding importance of addressing scientific thought at various levels, and particularly among leadership so that the initiatives in promoting science and the scientific mind will not meet with resistance and misunderstanding. In addition, this group highlighted the importance of developing tools and methods for furthering critical thought, not just within education but also at a more general level and particularly in the media.

The synthesis group worked during the colloquium trying to make sense of the diverse visions, generated by self-organized working groups, about the scientific mind and the factors that foster it. Preliminary conclusions of the synthesis group are that it does indeed make sense to use the construct 'scientific mind' but that it is very difficult to define it in precise terms. Many features that can be identified as pertaining to the scientific mind are equally part of the mindset that drives artists. In the true spirit of science, which pursues truth while recognizing that there is no absolute truth, dialogue seems to be the most essential aspect of any attempt to map the scientific mind and the conditions under which it grows. This being the case, members of the synthesis group have decided to continue their exchange of ideas by electronic means. Ron Burnett and Jan Visser will start this off by email and subsequently integrate their start-up dialogue in the blog for the BtSM community so that others can start contributing to it.

There was also some discussion on the "group that never was" i.e. the group about gender and the scientific mind. However, there was agreement that gender did constitute an important discussion point among groups that met and had thus been dealt with extensively in context. It was agreed that the topic is in itself critical

enough that it might merit the attention of a separate group in specific follow-up meetings. It was thus noted that future discussions of this kind (including at country level) should make an effort to ensure that gender be an integrated dimension of the debate.

In a similar vein, it was mentioned that transdisciplinarity had been an implicit dimension of much that had been discussed. Like in the case of gender, it was suggested that future meetings could focus even more explicitly on transdisciplinarity and on using the discussion around science to move beyond science into other areas.

Other initiatives

Gilles Lavigne of the Universidad Autónoma de Baja California in Mexico indicated his commitment to moving forward with a number of concrete initiatives, including:

- Replication of the work that has been done by John Falk and his colleagues of the Institute of Learning Innovation in the Mexican context.
- Organization of workshops around key BtSM themes with students from the Faculty of Sciences as part of the extension of the dialogue to country level.
- Introduction of a course on "Science and Society" to be based on the experience of John Avery of the Ørsted Institute (University of Copenhagen)

The results of these initiatives will be shared among the wider BtSM community.

Finally, LDI agreed to put its networking and advisory capacity at the disposal of the BtSM participants in furthering all of these initiatives. LDI will also be reporting back on progress made with respect to these commitments at regular intervals.

ANNEXES

ANNEX 1: List of participants

| <u>NAME</u> | <u>COUNTRY</u> | <u>AFFILIATION</u> |
|-------------------|----------------|--|
| Yasmina Ahmed | MZ/NL | Independent |
| John Avery | DK | Ørsted Institute |
| Elise Boltjes | NL | Noordelijke Hogeschool Leeuwarden |
| Dr. Ron Burnett | CA | Emily Carr institute of Art & Design |
| Louk Box | NL | Institute of Social Studies |
| Virginia del Re | IT | Independent |
| Marten de Vries | NL | University of Maastricht |
| Lynn Dierking | US | Institute for Learning Innovation |
| Laura Dunford | NL | Radio Nederland |
| Peter Eisenberger | US | Columbia University |
| John Falk | US | Institute for Learning Innovation |
| Zahara Girones | ES | Nijmegen University/Universidad Autónoma de Madrid |
| Paul Grobstein | US | Bryn Mawr College |
| Chide Groenouwe | NL | Network Universalis and Free University Amsterdam |
| Matthew Jukes | UK | Imperial College School of Medicine |
| Christopher Kolar | US | Illinois Mathematics and Science Academy |
| Peter Lavender | UK | National Institute of Adult Continuing Education |
| Gilles Lavigne | MX | Universidad Autónoma de Baja California |
| Leon Lederman | US | Illinois Mathematics and Science Academy |
| Dawood Mamoon | PK | Institute of Social Studies |
| Federico Mayor | ES | Fundación Cultura de Paz |

| | | |
|-------------------------------|----|---|
| Roy McWeeny | IT | University of Pisa |
| Paula Monjane | MZ | Fundação para o Desenvolvimento da Comunidade |
| Sailaja Nandigama | IN | Institute of Social Studies |
| Corina Negrea | RO | Radio Romania |
| Katherine Nielsen | US | Independent |
| Evgeny Patarakin | RU | UCHCOM Laboratory |
| Vimla Patel | US | Columbia University, New York |
| Tjeerd Plomp | NL | Twente University |
| Bill Rogoza | CA | Northern Ontario Native Tourism Association |
| Christina Rogoza | CA | Nova Southeastern University |
| Nicholas Rogoza | CA | Queen's University |
| Eric Ross | NL | Institute of Social Studies |
| Gordon Rowland | US | Roy H.Park School of Communications, Ithaca College |
| Ronald Siebes | NL | Free University Amsterdam |
| Walter Staveloz | BE | ECSITE |
| Diana Stirling | US | Independent |
| Jaap Swart | NL | JOTA foundation |
| Ralf Syring | MZ | Terre des Hommes |
| Mohsen Tawfik | IN | UNESCO Delhi |
| Bruno Valfrey | FR | Learning Development Institute |
| Tania Vergnani | ZA | University of the Western Cape |
| Lya Visser | FR | Learning Development Institute |
| Jan Visser | FR | Learning Development Institute |
| Yusra Visser | US | Learning Development Institute |
| Muriel Visser | FR | Learning Development Institute |
| Rose Wambui Wamuthenya | KE | Institute of Social Studies |
| Cheryl V. Whitman | US | Education Development Center |
| John R. Whitman | US | Ontario Institute for Studies in Education, University of Toronto |
| Abraham Zalzman | VE | Grupo INESTED Internacional |

ANNEX 2: Program

TUESDAY MAY 17

| | | |
|----------|--|---|
| 9:00 AM | Registration + welcome coffee/tea | All |
| | Preparation individual and group displays for Knowledge Café | Everyone who wishes to develop an initiative in the context of the Knowledge Café |
| 10:30 AM | Official opening by host | Louk de La Rive Box, Rector, Institute of Social Studies, followed by brief UNESCO statement by Mohsen Tawfik, Director, UNESCO Delhi |
| 10:45 AM | Introduction to the colloquium by organizer | Jan Visser, President, Learning Development Institute |
| 11:00 AM | Mapping the Scientific Mind | Abraham Zalzman (group process) and Jan Visser (concept mapping). All colloquium attendees participate, working in six groups. At end of session reporting to plenary by selected group. Others comment and complete. Follow-up required: Synthesis by volunteers later in de day. |
| 12:30 PM | Lunch break | All. Lunch takes place in Atrium. Participants are invited to self-organize and use part of the time available for Knowledge Café related exchanges. |
| 1:30 PM | The Scientific Mind as a multifaceted concept | Three plenary interventions, Paul Grobstein (brain and development of the scientific mind); Diana Stirling (ways of thinking in art and science); Matthew Jukes (children's perceptions of health in a developing country context) |
| 2:30 PM | Exploring the Knowledge Café | Opportunity for all to familiarize themselves with all that is available in the Knowledge Café |
| 3:00 PM | Break | Coffee/tea served in Knowledge Café area |
| 3:30 PM | Special interests | Two-hour timeslot for dedicated work on issues of special interest. In some cases these activities have been prepared in the running-up to the colloquium, in other cases they will be self-organized on the basis of participants' interests. Within this context, at least one group works on the synthesis of "Mapping the Scientific Mind." |
| 5:30 PM | Welcome reception hosted by Rector Institute of Social Studies | All participants are invited |
| 7:00 PM | End of Day 1 | Participants self-organize for dinner and evening activities. |

WEDNESDAY MAY 18

| | | |
|-----------------|---|--|
| 9:00 AM | The case of symmetry: Can science and art learn from each other? | Leon Lederman - Plenary presentation |
| 9:30 AM | Balancing professionalization and passion | Louk de la Rive Box - Plenary presentation |
| 10:00 AM | Reporting Special Interest Groups | Reporting/Brief presentation by select groups (this includes necessarily result of synthesis of "Mapping the Scientific Mind") |
| 10:30 AM | Break | Coffee/tea served in Knowledge Café area |
| 11:00 AM | Mapping the conditions of growth of the Scientific Mind | Abraham Zalzman (group process) and Jan Visser (concept mapping). All colloquium attendees participate, working in six groups. At end of session reporting to plenary by selected group. Others comment and complete. Follow-up required: Synthesis by volunteers later in de day. |
| 12:30 PM | Lunch break | All. Lunch takes place in Atrium. Participants are invited to self-organize and use part of the time available for Knowledge Café related exchanges. |
| 1:30 PM | Building the Scientific Mind through planned intervention in structured settings | Three plenary interventions, Yusra Visser (convergence and divergence in children's attitudes toward sciences and science education); Elise Boltjes (gender and the building of the scientific mind); John Avery (developing the social responsibility of scientists). |
| 2:30 PM | Special interests (coffee and tea, served in Knowledge Café area, taken while work continues) | Two-hour timeslot for dedicated work on issues of special interest. In some cases these activities have been prepared in the running-up to the colloquium, in other cases they will be self-organized on the basis of participants' interests. Within this context, at least one group works on the synthesis of "Mapping the Factors of Growth of the Scientific Mind." |
| 4:30 PM | Halfway round-up | Assessment of where we stand after two days of work and how we should possibly adjust as we prepare for the third and fourth day of the colloquium. |
| 5:00 PM | Bar open for BtSM participants until 7:00 PM. | All participants are welcome to buy their drinks from the ISS bar, which is open for the benefit of all interested BtSM participants. Jan Visser facilitates a 'Drink Tank' on <i>Ethics and Science</i> for those enticed by the topic. |
| 8:00 PM | Official Colloquium Dinner in Restaurant Surakarta | Colloquium participants will enjoy an opulent 'rijsttafel' buffet dinner at a nearby Indonesian restaurant (included in registration fee). |
| 11:00 PM | End of Day 2 | |

THURSDAY MAY 19

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| 9:00 AM | Building the Scientific Mind in loosely structured settings with emphasis on free choice | Four plenary group interventions, Falk/Dierking/Eisenberger/Staveloz (museum setting); McWeeny/Avery/L.Visser/J.Visser/Stirling (For the Love of Science/flexible curriculum design); Durnford/Negrea/Swart/DeVries (broadcast media settings); Patarakin/Groenouwe/Siebes (Internet-based settings) |
| 10:30 AM | Break | Coffee/tea served in Knowledge Café area |
| 11:00 AM | Special interests | One-and-a-half-hour timeslot for dedicated work on issues of special interest. In some cases these activities have been prepared in the running-up to the colloquium, in other cases they will be self-organized on the basis of participants' interests. Within this context, at least one group works on the synthesis of "Mapping the Scientific Mind." |
| 12:30 PM | Lunch break | All. Lunch takes place in Atrium. Participants are invited to self-organize and use part of the time available for Knowledge Café related exchanges. |
| 1:30 PM | The Scientific Mind in context: Limits of the scientific mind and competing mindsets | Three plenary interventions, Eric Ross (AIDS, the scientific mindset and the structure of science); Gilles Lavigne (critique of the assumptions underlying the training of scientists for the developing world; Jan Visser (not by science alone) |
| 2:30 PM | The Scientific Mind in context | Plenary debate |
| 3:00 PM | Break | Coffee/tea served in Knowledge Café area |
| 3:30 PM | Reporting Special Interest Groups | Reporting/Brief presentation by select groups (this includes necessarily result of synthesis of "Mapping the Factors of Growth of the Scientific Mind") |
| 4:00 PM | Science, society and community | Christopher Kolar - plenary presentation on Student Engagement, Science, Society, and Community at IMSA; Ralf Syring - plenary presentation on Science, Mindsets, and Community. |
| 5:00 PM | Bar open for BtSM participants until 7:00 PM. | All participants are welcome to buy their drinks from the ISS bar, which is open for the benefit of all interested BtSM participants. |
| 7:00 PM | End of Day 3 | Participants self-organize for dinner and evening activities. |

FRIDAY MAY 20

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| 9:00 AM | Working together across boundaries | Plenary sessions by Katherine Nielsen on Boundary Problems to Networked Solutions and Federico Mayor on Science and Society, followed by plenary debate aiming at generating vision regarding the world we want and the role of science in advancing it |
| 10:30 AM | Break | Coffee/tea served in Knowledge Café area |
| 11:00 AM | Science and the world of tomorrow | Summary reporting and discussion of commitment to follow up |
| 12:30 PM | Lunch break | All. Lunch takes place in Atrium. Participants are invited to self-organize and use part of the time available for Knowledge Café related exchanges. |
| 1:30 PM | Closing | Jan Visser (LDI) |

NOTE: Identified special interests: Health (particularly HIV/AIDS) and the Scientific Mind; Building the Scientific Mind in a Developing World; Science Learning Across the Lifespan: Mapping freechoice science learning across a community; Art and Science; Science and Society; Mapping the Scientific Mind and the Conditions of its Growth; Gender and Building the Scientific Mind (to be completed with inputs from participants). A specific interest group has a minimum of three participants. If the minimum is not reached, participants representing the specific interest in question join other groups in which they can inject their concerns.

LEGEND

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| | General/Relating to overall organization of the colloquium |
| | Knowledge Café and informal purposeful interaction |
| | Consensus building around key conceptual issues |
| | Plenary sessions providing food for thought |
| | The scientific mind in action: Work by special interest groups |
| | Building vision and commitment regarding what to do next |