INTRODUCTION

The main objective of the Technical Initiative #4 of I-INCE is to develop recommendations for schoolroom acoustical criteria, including practical knowledge of the costs and benefits of noise and reverberation control, in order to optimize acoustic environment, in learning spaces. The aim of these recommendations is to provide acoustical and noise control guidance to educational space designers and builders, and to those who influence national codes for schoolroom design.

This report summarizes the work realised by the group within the second year and explains the work intended for the next period.

WORK REALISED WITHIN THE SECOND YEAR

1- One formal (Second Meeting, 27 August 2001) and one informal (4 September 2001) meetings are held. The formal second meeting of the I-INCE Technical Initiative #4, is realised during INTERNOISE 2001 Congress at The Hague, Netherlands, by the participation of the convenor and representative of four member societies. A repetition of the second meeting is planned and realised during ICA 2001 at Rome, Italy, as some of the group members informed the convenor that they can only be present at this Congress. Representatives of five member societies, convenor and eight colleagues from different countries attended this meeting. Participants list of these meetings is below.

Participants List of the Second Meetings

<table>
<thead>
<tr>
<th>Members of TSG #4 attended to Second Meetings</th>
<th>Country</th>
<th>e-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gerrit Vermeir (The Hague Meeting)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Colleagues attended to the Rome Meeting</th>
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<tbody>
<tr>
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</table>
Main topics of the meetings were as follows:

- Classification and presentation of the previous and current researches
- Presentation of current national and international guidelines and standards
- Description of architectural, cultural and environmental properties of schools and classrooms in different countries
- Investigation on the cost-effective application of noise control and room acoustical technologies related to the classrooms

**Classification and presentation of the previous and current researches;** it was suggested that each member of the group provide a list of relevant papers, documents etc. The group also discussed possible ways of organising the material collected, for example by category (published papers, reports, etc.) or by subject (effects, performance, stress etc).

**Presentation of current national and international guidelines and standards;** The group discussed changes to guidelines and/or standards in Belgium, UK, USA, France and Sweden. It was agreed that the draft of the final report could be prepared and the guidelines section could be updated when necessary.

**Description of architectural, cultural and environmental properties of schools and classrooms in different countries;** No information has been received concerning architectural properties of school buildings in different counties. N. Y. Akdag, tabled a proforma designed to acquire this information. The best way of using the form was discussed and it was suggested that individuals with the appropriate knowledge such as noise consultants should be asked to provide the relevant information for a typical school in each country. The information obtained could then be collated and summarised as a table for the final report. The draft table for collecting related data has been decided to be re-examined by the group members and evaluated if necessary.

**Investigation on the cost-effective application of noise control and room acoustical technologies related to the classrooms;** A discussion on how to deal with this topic has been held. It was mentioned that to take the views of consultants and architects working on school buildings will be a good idea. Giving samples for different types of classrooms has been mentioned as a possible way of presentation of the cost-effective methods and materials.

2- The report of the Second Meetings, including a timetable, is prepared and sent to the members on 17 September 2001.

3- After several correspondences with the group members a Draft Table of Contents for the Final Report is prepared and distributed to the partners on 13 February 2002. The main topics of the draft are as follows;

1- **Introduction;** scope and solutions, economical aspects, and report objectives *(Z. Karabiber)*
2- **Researches, technical knowledge and experience in classroom acoustics** *(M. Hodgson, B. Shields)*
3- **National and international noise policies** (standards, regulations, guidelines, etc.) *(M. Vallet, Z. Karabiber)*
4- **School and classroom characteristics** *(L. Maffei, N. Y. Akdag, R. Neubauer)*
5- **Recommendations;** a clear document to support individuals and entities in improving the acoustics of learning spaces *(D. Lubman, L. Sutherland)*
6- **Cost-effective noise control measures**
7- **Conclusion;** dissemination of technical knowledge, development of policies, economic aspects, further data collection and research needs

**Annexes** - Metrix and descriptors *(L. Sutherland)*
4- M. Vallet contacted several colleagues from different countries regarding national policies and collected information to complete the Chapter 3. Information has been collected from several other European countries (Greece, The Netherlands, Swiss, Spain, from Brazil, and a very consistent one from Japan. Contacts with some other countries have shown a low interest for these policies, or light efforts to respect the edited thresholds, or even a lack of scientific basis.

5- L. Maffei, E. Viverios, R. Neubauer and N. Y. Akdag prepared a form which is distributed to the colleagues by L. Maffei, in order to gather information for the architectural features of the schools in different countries. Contribution from Brazil, Germany, Japan, Italy, Sweden and Turkey are received so far and a brief summary presenting the situation on these countries are prepared by Luigi Maffei.

6- After the second informal meeting, Elvira Viverios (Brazil) and Reinhard Neubauer (Germany) are invited to join the working group as the representatives of Brazil and Germany.

DISSEMINATION ACTIVITIES
A special session on Classroom Acoustics has been organised at 17th ICA, Rome, Italy, www.ica2001.it by David Lubman and Louis C. Sutherland.

A special session “Classroom Acoustics”, has been organised at the INTER-NOISE 2002, Dearborn, USA, www.internoise2002.org, by Zerhan Karabiber and Michel Vallet

A paper is presented at NOISE-CON 2001;

The I-INCE technical initiative for schoolrooms acoustics
Louis C. Sutherland, David Lubman, Zerhan Karabiber

A paper is prepared for the special session on the HNCE Technical Initiatives at internoise 2002.

The I-INCE Technical Initiative Noise and Reverberation Control in Schoolrooms
Z. Karabiber, D. Lubman, L. Sutherland

An article at the Noise Control Engineering Journal 50 (2), 2002 Mar - Apr, is published;

Some European policies regarding acoustical comfort in educational buildings
M. Vallet, Z. Karabiber

WORK PLANNED FOR THE NEXT PERIOD
Preparation of the draft report, by the close collaboration of the group members.

NEXT MEETINGS
Third meeting of the TSG will be realized on 18 August 2002 in Dearborn, but most of the members seem not to be able to participate.

CONCLUSION
While a considerable part of the work planned has been completed, there is still much to do. Several difficulties can be mentioned from which the most important is the difficulties of correspondences and feedback. The goals of the technical initiative can only be achieved by a strict planning and good collaboration of the group members.

Zerhan Karabiber
Istanbul, July 2002