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## NETWORKING FOR MEASUREMENT EDUCATION

IMEKO TC1 has started a series of On Line (virtual) Workshops and a Portal for joint use of educational material. The aim of this activity is to help educators in organizing good co-operation and getting benefit of synergy in their work. The educators' work includes classroom teaching and supervising of students, but also developing and collecting educational material, and preparing textbooks, lecture notes, exercise collections, demonstrations, etc. for educational use. Transferring new scientific results into a new form suitable for education is not a minor duty. The paper presents experience from the first Workshop and discusses needs, difficulties and methods in development of networking.

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### 1. INTRODUCTION

IMEKO (International Measurement Confederation) was established in 1950'ies. Already in its early years a keen interest was seen in educational matters. The first IMEKO Technical Committee (TC1) was named *Higher Education*. Later on the name has been amended into its current wording *Education and Training in Measurement and Instrumentation*.

The first events of TC1 handled the fundamental questions of measurement science: How to describe such a science; how to "prove" its existence in the family of sciences. In the 1975 Symposium a firm answer to this question was presented, and afterwards the education-minded scientists and industrial experts discussed many topics of measurement science. Let us mention here some events [1]:

- Symposium über Hochschulausbildung in Meßtechnik und Gerätebau (Symposium on Higher Education in Measurement Technology and Instrument Manufacturing), Rostock/Berlin (DDR), 1968,

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- Colloquium on The Nature and Scope of Measurement Science, London, 1975,
- Regional IMEKO Colloquium on The Nature and Scope of Measurement Science, Armidale, 1976,
- Symposium on Teaching Measurement Science Through Laboratory Experiments, Stockholm, Sweden, 1977,
- Colloquium on Problems and Trends in Measurement and Instrumentation Education – Microprocessor and Allied Techniques – Budapest, 1980,
- Measurement training, Condition training for Transfer of Practical Experience Condition Based Maintenance and Technical Diagnostic of Mechanics, Zagreb, 1985,
- Knowledge Based Measurement, Karlsruhe, 1990,
- Pre-Congress Workshop on Generation and Verification of Functional Surfaces, Tokyo, 1999,

During each IMEKO World Congress TC1 had sessions on topics relevant to its field.

The number of members in the Technical Committee was increasing steadily, but the participation numbers of the Symposia were not too big. Therefore a suggestion came out to organise a Virtual (or On Line) Workshop and to combine it with a “real” Symposium [2, 3]. This combination should give a good possibility to participate also for those who cannot travel for a Symposium. As foreseen, the number of participants contributing the Virtual Workshop was not very big, but the Symposium had more participants.

## 2. ROLE OF VIRTUAL WORKSHOPS IN NETWORKING

The aim of the first virtual workshop was

- To collect contributions from authors for a common On Line discussion,
- To gather educational tools for joint use,
- To prepare the following Symposium,
- To collect experience from this form of workshop for further development.

The Symposium arranged a Round Table discussion [4] identifying the way ahead. A clear need for networking was seen, because many educators develop own tools, and a co-operation interest exists.

The author sent after the Symposium a questionnaire collecting opinions and experience on the workshop. The questionnaire was sent to all authors of the Symposium; seven reviews were collected. The need to continue the series of On Line Workshops was again seen. From the replies one could see that there is still a need to

develop ways of thinking and contributing. This is presented in the following in more detail.

## 2.1. ORGANISING THE WORKSHOP

Preparation methods for a scientific Conference have changed recently to utilise new possibilities given by the Internet. There are dedicated software products for managing the review work. E-mail is used extensively, for example for submitting the Abstract and the Full paper.

The Workshop is a small event. Therefore simple procedures can be used, but the ease and the speed of the E-mail are very useful.

Figure 1 presents the schedule of procedure used for the Virtual Workshop.

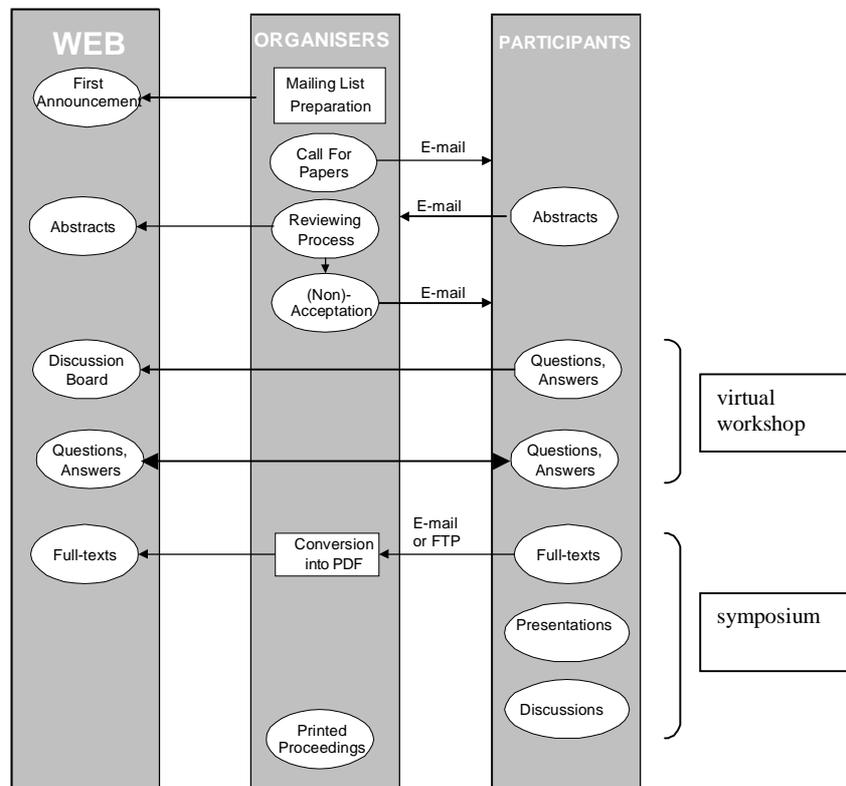


Fig. 1. Organisation system of the Virtual (On line) Workshop

Figure 2 presents the organisation of the Workshop Sites.

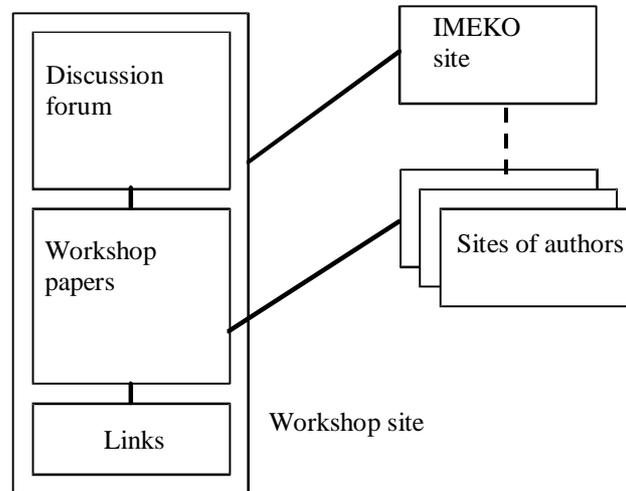


Fig. 2. Site structure of the On-line Workshop

## 2.2. ANNOUNCING METHOD

Most participants were informed by E-mail or by notice from their MO or IMEKO Information Service (Discussion Group). Some participant had even found the Home Page of the event by using a Web search tool. Surprisingly, the IMEKO Home Page was mentioned only once. These methods were found very satisfactory; one suggestion came to inform IMEKO Member Organizations with a printed announcement.

## 2.3. POSSIBILITIES OF THE WORKSHOP

Almost every participant was looking for educational material for his/her own teaching work. There was also a clear wish to distribute own tools to other colleagues. A continuous discussion forum for educators was needed, too. The opinions how to arrange for that varied somewhat; the Workshop was evaluated as “good” or “OK”, but some hesitation also came out about the usefulness. One opinion example: *The value of the current method has still to be proved. The frequency of once a year seems adequate: the development of new tools takes much time. On the other hand: an annual opportunity stimulates to remain alert and to keep going on.*

## 2.4 DIFFICULTIES TO OVERCOME

It was a little bit surprising to see that many aspects of the co-operation did not work as expected. Most participants said that they found useful tools in the Workshop material, but very few tools were used. The reason was not always given. One participant said that he does not use the tools directly, but rather take experience/inspiration from some of them. Some authors of the tools said that they are ready to distribute the tools only “when available in the final version”. Another author indicated a difficulty of financing the development and maintenance work.

Other difficulties were the problem of language. English cannot be used everywhere. There is also the problem of various platforms and operating systems, some problems coming from the commercial world we are living in, and some problems of copyright (restricted methods of use of shared tools).

The difficulties presented may be severe in some cases, but not generally. A more usual problem seems to be that the potential user did not quite see the value (or where and how) to use the tools, and he/she lost the interest to try the tool immediately. Later on it seems to be harder to remember that there is already a suitable tool available for a new education task.

## 3. WEB PORTAL

IMEKO TC1 has a Portal [5] set up by the Chairman. This portal is for joint use of members working in the area of TC1. During the time this text is authored the portal is yet under construction; more information should be available at the Symposium.

## 4. DISCUSSION

The basic structure and organising procedure of a Virtual Workshop is presented. The networking of educators should use a series of similar Workshops and the forum given by the portal (Internet Home Page). Some experience and challenges found out are also listed. More experiences are welcome to the author, particularly during the Second Workshop. They will be gathered and presented orally at a Round Table during this Joint IMEKO TC-1& XXXIV MKM Conference 2002.

## REFERENCES

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