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Telematics for Teacher Education: issues from a European conference

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ABSTRACT The world Information Superhighway is under discussion in many countries. Within Europe the discussion is also very active as is the promotion of the use of telematics for trans-European communication and co-operation in various areas. For education and training, representatives of European teacher trainers, teachers, students, parents, policy and decision makers discussed their needs and views on a trans-European network at a conference held in May 1994 in Luxembourg. This paper presents a selection of various issues raised at the conference regarding the use of telematics for teacher education and illustrates the discussion and the method of discussion. It also describes and discusses the conference programme model, as it offered innovative on-line activities to facilitate appreciation of telematics. The case is argued that teacher education can benefit greatly from telematics and some points are put forward for further discussion.

Introduction

Telematics has recently been defined as the application of information and communication technologies and services, usually in direct combination. The use of such technology in education is increasingly being studied as a means of supporting and enhancing education in a wide range of settings (see, for example, Davis, 1994; Davies & Samways, 1993; Mason & Kaye, 1989).

Reflecting the growing interest in using telematics to support teaching and learning (Veen & deVries, 1994), various European countries are experimenting with the Information Superhighway using a variety of approaches and activities in all educational sectors. However, there is no

common European network. The role of such a network for education and training within the European Union was addressed at the Luxembourg Link conference in May 1994 (hereafter referred to as 'LuxLink').

This paper will introduce some findings and considerations of the use of telematics in teacher education, from a needs analysis carried out at LuxLink. It will briefly describe the LuxLink conference and the research method used to collect data. Secondly, the discussion that took place at the conference among the participants, when discussing teacher training, and more detailed discussions by teacher trainers, will be illustrated. I then relate the program design of the conference with similar events using the same kind of technology to enhance educational communication and debate. The paper ends with a discussion of issues arising and their application for teacher education.

**Research at LuxLink: users' needs and
views on a European network for education and training**

The Conference

The idea of a trans-European network for education and training has been supported by various individuals, groups and institutions at least since 1990 (for a description of these developments see Steele, 1994a and 1994b; Collis & deVries, 1993). Strategy documents were prepared to support Community action on the use of information and communication technologies in education and training (Steele, 1990; Figueiredo, 1990). In 1992, the Commission of the European Communities made a Call for Expressions of Interest to launch a European BBS (electronic Bulletin Board System) for education and funded the Faro Forum. The Faro Forum was a conference with a similar purpose to LuxLink, held two years previously in Faro, Portugal.

Since then, various studies had been conducted "to look at the issues necessary to set up a network and attract support from the various partners" (Steele, 1994a). Among these studies, experiences with telecomputing in education are illustrated (Steele, 1993), the emergence of a Trans-European Network is recognised (Collis & deVries, 1993), specifications of the requirements of user friendly interfaces are described (Figueiredo, 1993) and guidelines for decision makers are outlined. Those studies constituted the preparatory documents for LuxLink. Parallel developments are underway in other parts of the world (see, for example, Bull, Cothorn & Stout, 1993, for the American case and Ranebo, 1994, for the Nordic countries). A European network for education and training or some kind of co-operation as part of the global Information Superhighway appears to be almost inevitable.

The LuxLink conference brought together approximately one hundred participants from all the European Union countries. At that time there were twelve. It aimed to exchange and gather users' needs and ideas about

TELEMATICS FOR TEACHER EDUCATION

existing networks and to prepare the way for a future European network for education and training. The conference was supported by the European Commission (Task Force Human Resources, Education, Training and Youth) and the Luxembourg Ministry of Education. Delegates were selected to represent European teacher trainers, teachers, students, parents, policy and decision makers, network providers and computer specialists, as shown in Figure 1. This provided insights from a considerable range of future trans-European network users. The participants had different kinds of computer and network experience, from the computer specialist to the computer beginner. Figure 2 provides more detailed data on the participants previous declared experience with computers and networking, taken from the registration forms.

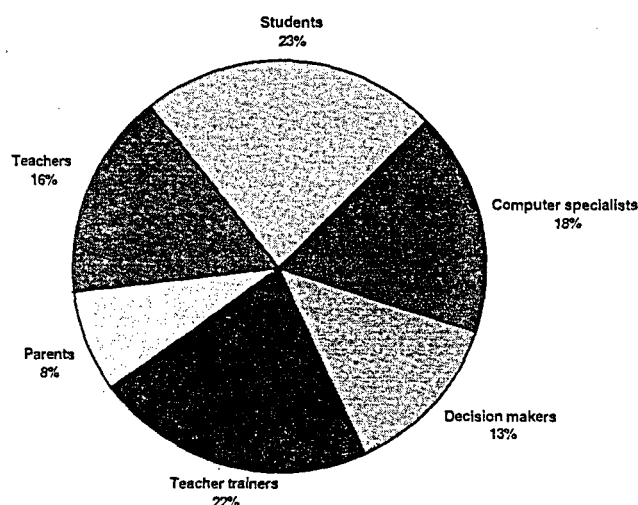


Figure 1. Participants at LuxLink (n=91).

As is described in detail later in this paper, the conference was planned and organised in a way providing both face to face and on-line activities. These provided the hands-on experience of a hypothetical model of such a trans-European network. This model was a combination of World Wide Web (WWW) pages and a News reader computer conferencing application called Trumpet for Windows. The WWW URL remains active to date (<http://www.restena.lu/llink/llink.html>).

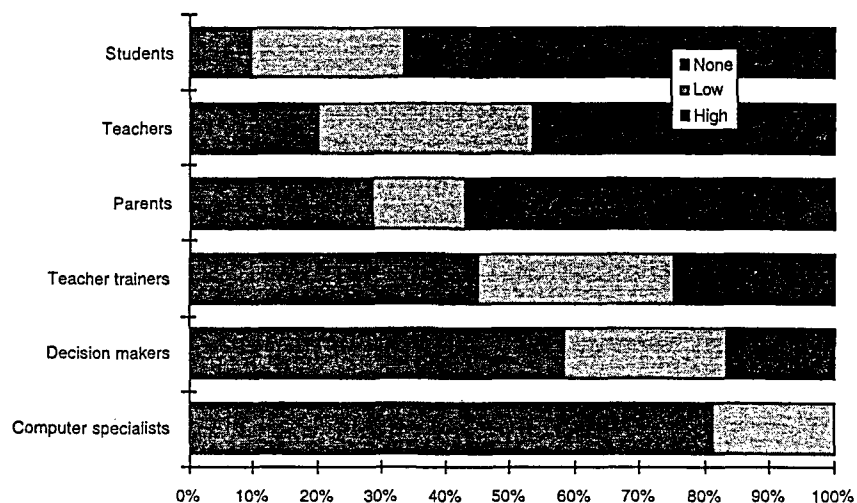


Figure 2. Participants declared previous experience with networking ($n=91$).

Research at the Conference

A research project was designed to make use of the opportunity offered by LuxLink. The objectives of the study, its methodology and the research tools were designed around the conference programme which included activities allowing participants to express their needs and views in several ways:

- a brainstorming session; .
- a workshop presentation of networking navigation tools;
- face to face discussions; and
- on-line discussions.

Focusing on the participants, the objectives of the investigation were:

- to identify their various needs and views;
- to describe their reaction to the demonstration of a network; and
- to understand their expectations of a possible European network.

The data were gathered both directly from the conference activities and from previously designed research tools. The data sources and research tools were:

- participants application forms;
- brainstorming session cards;
- researcher's observation notes;
- saved messages (articles) posted by participants in the on-line conference;
- group reports; and
- a questionnaire given to a 20% random sample of participants (return of 60% after the conference).

Summary of General Findings

A considerable amount of data was analysed, including 14,277 words in the actual text of 384 articles posted on the on-line conference, which lasted for approximately two hours. It is reported in detail in the conference proceedings (Osorio, 1994) but I will give an overview of the general findings, to set the scene.

Both from the observation, the groups' final reports and from the answers to the questionnaire, the analysis revealed a supportive attitude to the idea of creating a European network. In addition, some general views of the network were identified. For example, both the design of the conference program and the hypothetical model of a trans-European pilot network for education and training were seen as effective.

From the sample of participants answering the questionnaire, the following findings were identified. The first reaction to the demonstration of the network model was positive, although there were a few comments related to its slow speed. However it should be borne in mind that international access was connected by a 64k link for a hundred participants to browse both text and image. The user-friendly interface and the role of the facilitators who led the workshops were appreciated. For some participants, an insight into "the possibilities of new communication and information technologies" was useful. "Not only talking, but also doing, trying" allowed people to consider such a network model as something "easy to use, with a little practice". Various suggestions were made to improve the model, although some inexperienced participants found difficulty in commenting. Besides the network access requirement and the information overflow fear, the language access to all was strongly pointed out. Moreover, there was a feeling that the three-day conference could not cover all aspects and would restrict the evidence to a very small group of people.

Results

Teacher Trainers' Views and Views about Teacher Training

At LuxLink, approximately twenty teacher trainers represented nine of the countries (Denmark, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain and United Kingdom) of the European Union. They were nearly 20% of the participants and reported high experience in the use of information technology. Their reported experience with networking was heterogeneous, but nearly half of the group declared a high rate, while the other half reported low or no experience (see Figure 2). In common with other participants, they became very involved in the activities. Figure 3 shows the volume of teacher trainers' articles posted on the different topics of discussion in the on-line sessions, using the News reader software. Those

articles were saved and analysed following an adaptation of Radnor's (1994) descriptive/interpretive analysis method. This method involves the identification of discrete elements in the data and secondly, ordering the discrete elements into categories that may be explicit or implicit in the data (Radnor, 1994).

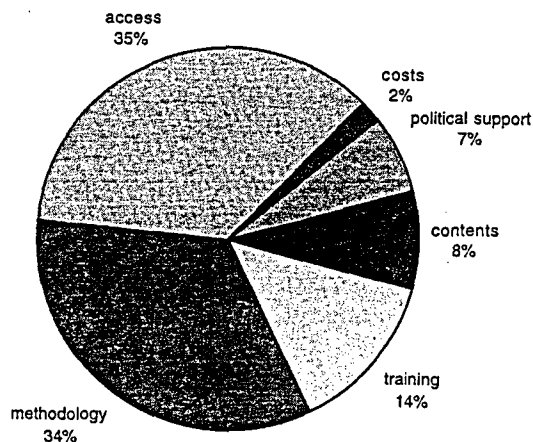


Figure 3. Volume of discussion by teacher trainers, organised by topic.

This section will illustrate the kind of discussion that took place throughout the conference, quoting teacher trainers' views and views about teacher training. Where necessary, editing corrections have been made to facilitate the understanding of the content of the quotations. If some unusual use of the English language is found, it should be acknowledged that the majority of the participants were not expressing their ideas in their native language.

Teacher trainers gave considerable attention to the problems of access, still an issue of paramount importance. They discussed how to provide wide access and what to do with it. There was general acceptance of the use of the Internet as the backbone for the European network. Teacher trainers considered, for example:

J Recommendation: Everyone on the Internet!!!!!!!!!!

P We should be able to support, in various ways, access for all the schools in which we place student teachers. This also means support for the practising teacher who works with our student teacher.

L For in-service teachers we also need access. A particular need is for training for Foreign Language training. In various countries few teachers other than those of Foreign Languages can communicate in languages other than their mother tongue. This is also a need in relation to the implementation of a Trans-European Network.

Contents of the network were also identified and considerable reference was made to the creation of the possibility of teachers and student teachers exchange of experiences, possibly in projects involving partnership between schools and Universities. In addition, suggestions were made about the availability of examples of good practice and the promotion of language learning activities.

Expectations that such a network could promote a new educational paradigm were also stressed:

HS It was stressed that offering access to Internet-resources also involves a change in the way we look at education and that teacher trainers should include this new way when doing in-service training (do we train our teachers to train our children?) or initial teacher education. Paradigm shift was the word: from the pure reproductive function of education towards the production of knowledge, sharing in interaction information and concepts. From frontal teaching in the isolation of the classroom to teams supported by the teacher around topics of interest, etc.

U & J We agree at the end, but it's a long way to go.

? And also, it is difficult to continually model this in teacher education (or in school practice) because some learning goals are not well met by group activity. The mixture is what is most important.

J&R Everybody agrees that education has to be child-centred so the network is an ideal instrument for promoting autonomy, BECAUSE searching for information to solve a given problem needs personal implication and therefore supports personal development. A significant learning will take place.

ND I agree that it may seem a long way to go so we had better start soon. How about practising what we preach as teacher educators? I know what hard work it is but it is also very rewarding.

The organisational and institutional aspects of the network were not exhaustively discussed, beyond some remarks asking for free or low costs for a wide educational use of a European network. On the other hand, the methods of training discussion reached a level of academic debate. One discussion reads as follows:

? As the technical development is changing very rapidly it is necessary that the teachers are trained for their work. The preparation for this kind of education needs therefore more time than other contents.

JM It is necessary for the training to be provided cheaply - the first stage is to train teachers (or the students?) to be able to use the simple parts

ANTONIO JOSE OSORIO

of the system, then further more complex aspects can be dealt with through the electronic network, rather than through face to face meetings.

ND For teacher training we need good cases where we use the technology to answer current needs, in an efficient way. Then the cost is justified. For example, it is expensive to replace teachers in school as they go away for in-service training and it is expensive to supervise student teachers in schools.

Apart from teacher trainers who obviously concentrated their discussion on their 'metier', other groups of participants (namely the students but also the teachers, parents and computer specialists) joined in the debate concerning training. The following are some of the issues addressed on the use of the network for teacher education:

H At first you need a basic training with three or four key components (techniques, handling, social environment). Later on you should use complementary studies. . .

U & J This is the wrong way. Don't teach/train in isolation but use rich context.

Jo Teachers also need time to play with the system. . . Perhaps think of teachers' on-line clubs, or subject association groups or even teachers talking to each other.

Ja We will have to offer resources on developing examples on how to use communication in the curriculum, because the teachers and students don't use the tool, unless it gives them some advantage.

N, U & J We need good cases where we can use the technology to answer current needs, in an efficient way. . . Let us use the network to service some of the needs arising in training. . .

? Students leaving college to take up their first posts as teachers need to be able to use this sort of technology. Their courses are already full. What are the best methods of making them familiar with the technology?

P The best method is the teacher as agent of his training combining theory and practice. . .

A Train the teacher educators how to use these technologies while teaching in their different courses or subjects.

*Face-to-face and Computer Conferencing:
complementary resources for teacher education*

This section analyses the LuxLink programme design, which, as mentioned above, included activities allowing participants to express their needs and views. In fact, it was not a normal conference with papers and posters. Its programme was the participants' responsibility to an unusual extent. The topics for discussion were designed by a brainstorming activity as described below. This model was designed by the steering committee, which contained leading experts in the field. It was found useful, both to help participants learn about networking and to provide a way of easy and powerful communication.

	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6
Format	Introduction plenary	Workshops	Parallel groups	Workshops	Parallel groups	Plenary
Activity	Brainstorming	Hands-on network navigation experience and on-line discussion practice	Face to face discussion	On-line thematic discussion	Face to face discussion	Report back
Group	All participants	Hetero-geneous groups	Hetero-geneous groups	Heterogeneous in the location; homogeneous on the discussion	Homo-geneous groups	All participants

Table I. Luxembourg Link Conference programme design summary.

Table I provides an overview of the conference programme. An initial brainstorming session was organised to elicit from participants their main expectations and concerns regarding the design and contents of an eventual 'European Network for Education and Training'. A synthesis of the ideas generated by that process was carried out and made available on-line, thus structuring the basis for group discussions.

The following day, a workshop on networking presented examples of existing network navigation tools. This was done through the exploration of the hypothetical model of a pilot network. The composition of the groups of participants was deliberately heterogeneous allowing a free exchange of information between people with different backgrounds and degrees of computer and network literacy.

The sessions took place in training rooms, with two or three persons sharing a PC loaded with appropriate software connected to the local area network of an higher education institution. This was part of the Internet via RESTENA, the Luxembourg national network for education and research.

Participants took part in a guided tour through a document (both on paper handout and in the WWW page on the computer screen), while exploring a network of information and learning to know and use the tools required for this purpose. This was practical hands-on experience of a network. Later, they focused on on-line conferencing, reading and posting messages concerning the discussion topics defined in the brainstorming plenary session the previous day. After the hands-on experience, heterogeneous groups had a face to face discussion, to discuss the same topics. The groups were moderated by a workshop leader. Finally, all participants returned to the training room and used the software to further discuss on-line the relevant topics with their specialists counterparts. A synthesis of the written comments made by the participants under the different topics was made by reporters and presented in printed form to their colleagues, this time in homogeneous groups. The purpose of these meetings was to finalise reports to be presented in a final plenary session.

Telematics Training

LuxLink provided various insights into the use of telematics for education and the discussion was generally in favour of a European network. However, the contribution of this conference lies in its programme model. With the necessary alterations, it could be adapted to educational settings, for telematics training, teacher education or other activities. Other examples are currently being offered to higher education and research communities world wide. For example, the Nato-ASI virtual conference used an on-line set of activities to facilitate previous and post discussion amongst the participants who were students and tutors in a NATO Advanced Study Institute in Edinburgh Heriot-Watt University, August 1994. Before the actual face-to-face meeting, the participants, introduced themselves using a mailing list. The same list also provided the organisation body with means of providing information to the participants. After this, as a second stage, some of the tutors initiated their themes by posting references for initial reading on a WWW site (this may still be available at <http://www.hw.ac.uk/~granum>). They also moderated the discussion of threads in special new mailing lists. After the Institute, a mailing list was kept open to allow the participants to discuss the editing of the proceedings.

Several points can be learned from this conference strategy that might apply to the design of teacher education activities with telematics. It should be noted, however, that conference participants are away from their normal work load. Therefore, the immediate application of such a model to other

educational settings needs adaptation and more research. The literature provides some guidance for design on-line discussions:

(i) An initial face to face meeting is helpful to trigger the beginning of a rich discussion. The actual face to face encounter and communication provides an introduction exercise useful for further on-line communication. From their experience, Steeples, Goodyear & Mellar (1994), among others, are also convinced of that.

(ii) The purpose for the discussion or activity should be clear and meaningful for the participants. Teachers, for example, as Grandgenett & Harris (1994) argue, would be best served by a more curricular approach for training in telematics.

(iii) The moderators have an important role. Spitzer, Wedding & DiMauro (1994), for example, acknowledged that and published a guide to help the teacher moderators in their American LabNet network.

Conclusion

Teacher education can benefit greatly from telematics. As a tool to facilitate and or complement teacher education provision or as means to enhance the professional development of teachers, telematics offers a wide range of technical and educational possibilities. For example, the LabNet community of practice also mentioned by DiMauro & Gal (1994) and elsewhere in this issue, is providing opportunities for the professional development of science teachers.

From the evidence presented in this paper, the following points can be put forward:

1. When given the opportunity, the end users were able to participate in the debate to conceptualise and design facilities and technology services. LuxLink clearly demonstrated that considerable expertise and knowledge is already available for the setting up of a network, and for a good educational use of telematics.

2. The technological development will not wait until educators finish debating new products. A simultaneous open-minded and evaluative attitude from those involved in teaching and research in education is required.

3. Various academic communities are already complementing their traditional activities (conferences, workshops, journals) with on-line databases and Internet servers to provide better access to information and activities useful for the whole group. These still are new, but in some cases rapidly becoming integrated in current practice. Soon they will be taken for granted and those lacking the skills to use them will be at a disadvantage.

Further discussion and continuous research are needed, to which, I hope, this paper contributes. Hopefully we will use telematics as one means to enhance the quality of telematics applications in education.

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TELEMATICS FOR TEACHER EDUCATION

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