Learning Communities - pedagogical considerations and uptake issues

David Griffiths  
*University of Bolton*, dai.griffiths.1@gmail.com

Hans Hummel  
*Open University of the Netherlands*

Nicholas Kearney  
*Florida Centre de Formacio, Spain*

Oleg Liber  
*University of Bolton*, o.liber@bolton.ac.uk
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ABSTRACT This report describes the proceedings of Prometeus Pedagogies Group Expert Meeting on Learning Communities, held in Majorca on the 18th and 19th of November, 2001. The discussions are placed in the context of the literature on learning communities, summaries of the expert presentations are provided, and conclusions are drawn in the form of policy and research recommendations.

EDITOR David Griffiths,
CONTRIBUTORS Hans Hummel, Nicholas Kearney, Oleg Liber
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Executive Summary

This report describes the proceedings of the Prometeus SIG Pedagogies Expert Meeting on Learning Communities, held in Majorca on the 18th and 19th of November, 2001.\(^1\)

**The context**

In the economy of the 21st century people are required to continuously absorb new knowledge and develop new skills, and business management experts such as Peter Senge and Etienne Wenger conclude that intervention at the organisational level is necessary. In this view structures should be established which encourage the formation of communities of learners and practitioners, and provide support for their activities. In these communities all participants explicitly recognise that they have something to learn from their participation, and knowledge is not conceived of as a static object, but as a living part of practice, even when it is documented. This perspective, however, which places learning at the heart of business activities, has as yet had little impact on educational institutions. It appears that the education system still preserves the methodologies and structures that evolved in response to the social and economic needs of the industrial revolution in which it has its origins.

Learning theorists have reached similar conclusions, and thirty years ago Freire and Illich proposed community based solutions to the problems faced by education. They both rejected the traditional paradigm whereby learning is delivered by the institution to the learner, and Illich also identified computers as a key resource in the implementation of learning communities. Their work has often been rejected as too radical and impractical, but their perspective is shared by current writers with a clear grasp of economic requirements, such as Seely Brown, Chief Scientist at Xerox.

The emergence of the Internet has spawned a huge number of on-line communities. It was quickly seen that these had great potential in education, but so far they have been mostly applied in distance education, and life long learning, rather than in mainstream education itself. Even where they have been applied, they have been often been an additional resource, rather than a transformational tool.

Thus the discussions at the Majorca meeting addressed a context in which the traditional formal education provided in schools and universities is dangerously out of step with the requirements of the world today. A need has been identified, there are pedagogic approaches based on learning communities which are available to address it, and there is appropriate technological support available, but nevertheless the education system remains largely untouched.

\(^1\) Details of the meeting are available on the Prometeus website: http://www.prometeus.org/index.cfm?PID=250
The expert sessions

Oleg Liber employed the Viable System Model (VSM) to analyse the simplifications and constraints which have evolved to deal with the complexity of education. These lead to systemic lock in, and the danger is that educational technology may be reinforcing it. This traditional structure needs to be reformed, for two reasons:

- New tools are available, which have the potential to increase the ability of actors in education to deal with complexity.
- Mass education evolved in the industrial age, but a modern economy, requires a larger number of people to be capable of working in teams, communicating effectively, solving problems, and continually adopting new skills.

Traditional formal education does not develop these process skills. Technologically mediated learning communities, with a high degree of self-organisation, offer a way of addressing this need. Judging by responses to the presentation, both in the session and informally, there was broad agreement with this analysis.

In the light of this consensus that there is a need to reform the structure of educational institutions and processes, then a clear way of describing and comparing them is required. Hans Hummel presented the Educational Modelling Language (EML), developed in the Open University of the Netherlands, as a meta-language tool which meets this need. EML is defined as “a semantic rich information model and binding, describing the content and process within units of learning from a pedagogical perspective”. EML recognises that it is important to focus on modelling activities rather than content, since education is not about consuming content, but rather the instructional problem is a matter of stimulating learning activities by learners, supporting them during performance, and assessing the process outcomes. There was a great deal of interest in this model, and it was referred to in later discussions as a valuable vehicle for focusing some aspects of the Prometeus research agenda. Some doubts were expressed as to the degree to which EML could capture all the complexities of learning and learners, but these were not perceived as invalidating the approach.

In the third expert presentation Nicholas Kearney examined the relationship between new technologies and the traditional academic community. An important theme in his presentation was the relationship between Learning Communities and Communities of Practice, drawing on work by Etienne Wenger. Learning can be understood as a process whereby learners gradually approximate to the behaviour and vocabulary of a particular community of practice, and learners are accepted into the community when they can participate in the activities of that community. Thus a learning community may be understood as a series of zones of proximal development, as the learning community gradually maps itself onto the target community of practice. Knowledge alone is not enough to gain admittance to a community, active engagement and participation is essential. Thus the approximation of a learning community to a community of practice permits outcomes to be held up against the benchmark of the wider community of practice, offering the possibility of effective assessment of learning.
Conclusions

The course of action recommended by the expert meeting is that the relevant national and European authorities commit resources to:

- Establish the necessary policies and actions to ensure that the benefits of learning communities, and in particular virtual learning communities, are not limited to areas such as distance education and life long learning, but are incorporated into the mainstream of education practice.
- Introduce actions which encourage the use of technology to assist in overcoming a legacy of educational practice rooted in a past socio-economic context, and marked by a rigid hierarchy and the distribution of centrally held knowledge.
- Implement funded action lines to encourage experimentation with self-organised learning communities at all levels and in the whole range of member states.

A number of research questions were formulated to move this process forward, addressing the institutional context for learning communities, the management of learning communities, and technical aspects. These are detailed in section four of the report.
1. Preface

Prometeus is an open initiative launched in March 1999 under the sponsorship of the European Commission with the aim of building a Common Approach to the Production and Provision of e-learning Technologies and Content in Europe. It is an expert opinion-making forum where actors from a wide range of professional, cultural and linguistic backgrounds, come together to build critical mass in the field of educational technology and applications.

The Prometeus Pedagogies Special Interest Group (SIG) was constituted to assess and attempt to create consensus regarding the kinds of pedagogical approach most suited to ICT based learning, with particular emphasis on conversational, self-directed, collaborative and organisational learning and cognitive apprenticeship.

The Pedagogies SIG organised two parallel expert discussions at the Majorca meeting,

*Learning communities- pedagogical considerations and uptake issues*

and

*Addressing change in the role of the teacher in ICT based learning – uptake and integration considerations*

This document reports on the former, and the latter is discussed in a separate report.

The aims of the learning communities discussion were defined as:

- To explore conditions involved in the existence, emergence and organisation of learning communities
- Explore the benefits of learning communities for personal and organisational learning
- Identify which outputs of ICT facilitate the generation of learning communities and how.
- Identify existing organisational and pedagogical constraints that affect the generation of learning communities.

Three expert presentations on learning communities were made to the meeting, the first two being followed by plenary discussions. The discussions were not, however, limited to the conference room, and they continued over meals and late into the night. This report was prepared from notes taken during the presentations, edited in combination with the presenters' slides and in consultation with participants. The resulting text, with full and attributed comments from the floor, was posted for consultation on the Prometeus site prior to preparation of the final document. In this final version of the report, however, only the invited experts are named.

The final section of this document identifies broad policy issues arising from the discussions, which need to be carried forward both within Prometeus and in collaboration with national and European bodies. With a view to inform this process more specific research questions are identified, to be addressed in a pragmatic research programme operating largely through action research. The policy issues and research questions may together be viewed as a policy recommendation from the Prometeus Pedagogies Group to the European Commission, offering a framework for the identification of future action lines.
In the course of the expert meeting, and the preparation of this report, a number of other questions were raised relating to education and e-learning policy, both at European and regional levels. The Prometeus Pedagogies Group will address these issues in future reports, from the point of view of expert users and other stakeholders. Collaboration is, of course, welcome from all interested parties.
2. A longer perspective on learning communities

The concept of the learning community as understood in the proceedings of the Pedagogy SIG has its roots in the work of several key researchers.

Peter Senge, one of the most influential thinkers on management during the last decade, has emphasised that if one wishes to be successful in the modern economy it is not sufficient to absorb a static body of knowledge.

*People with a high level of personal mastery live in a continual learning mode. They never ‘arrive’. Sometimes, language, such as the term ‘personal mastery’ creates a misleading sense of definiteness, of black and white. But personal mastery is not something you possess. It is a process. It is a lifelong discipline.*

*People with a high level of personal mastery are acutely aware of their ignorance, their incompetence, their growth areas.*

Senge argues that successful managers ensure that the institutions which they control provide support for their members in this process. He describes those institutions that achieve this as 'learning organisations', and maintains that all organisations should aspire to this state.

Another important contributor to this debate, also working from business perspective, has been Etienne Wenger, who has pointed out that "Since the beginning of history, human beings have formed communities that accumulate collective learning into social practices—communities of practice." Examples of such communities of practice include a wide range of areas, such as medieval guilds, skateboarders, nurses, street gangs, and, more relevant to our present purposes, scientific communities (such as experts in educational technology). What distinguishes such communities is that they "do not take knowledge in their specialty to be an object; it is a living part of their practice even when they document it. Knowing is an act of participation."

Wenger argues that in today's economy, where the skills and knowledge required by workers are evolving rapidly, it is essential for managers to take responsibility for establishing structures which provide support for such communities, and in particular to empower their members to take ownership of the body of knowledge itself.

One might expect that, of all organisations, educational institutions would have been at the forefront of attempts to incorporate ideas such as those outlined above. In reality, however, while the concept of a community of learners is long established, the idea that knowledge is not an object but rather a living part of practice has proved very difficult to incorporate into traditional educational practise. One factor which contributes to this resistance appears to be the particular conception of education which we have inherited from origins of the education as we know it today. In both traditional craft skills, and the knowledge based modern economy effective action is based on communities of practice. In the industrial revolution, in contrast, effective action was based on implementation of structures defined at the top of the hierarchy, and it found its ultimate expression in time and

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4 ibid
motion studies of assembly line techniques. Today's education system still preserves the preconceptions and structures which evolved in response to the social and economic needs of the industrial revolution in which it has its origins.

Thus, from the perspective of Senge and Wenger, it appears that the present formal education system is anomalous, and in need of radical reform\(^5\). It is expected to prepare people for an environment where knowledge is dynamic, and where they will have to take responsibility for their own learning, and participate in the process of defining knowledge, but it uses inappropriate methodologies which were developed many years ago for very different ends.

Freire, a pedagogue addressing the needs of the underclass rather than those of the leaders of the world economy, reached similar conclusions, and he described the traditional approach as the "‘banking' concept of education, in which the scope of action allowed to the students extends only as far as receiving, filing, and storing the deposits.\(^6\)". He proposed that this approach be abandoned, and replaced by a problem solving pedagogy, placing the problems of human beings in their relations with the world at the centre of learning. In this way learners become active participants in a learning community which takes action in its social context, and assume responsibility not only for their own learning, but also for the definition of knowledge itself (as Wenger also required).

Freire's pedagogic method, focusing on adult literacy, is set out in Pedagogy of the Oppressed, and is well summarised by Colin Waugh\(^7\). A wider perspective on alternative structures to those offered by the traditional formal education system is provided by Freire's contemporary Ivan Illich. In Deschooling Society he identifies the central problem:

Creative, exploratory learning requires peers currently puzzled about the same terms or problems. Large universities make the futile attempt to match them by multiplying their courses, and they generally fail since they are bound to curriculum, course structure and bureaucratic administration. ..... The most radical alternative to school would be a network or service which gave each man the same opportunity to share his current concern with others motivated by the same concern\(^8\).

Illich argues that existing formal education systems are incapable of reform, and needs to be replaced with what he calls 'learning webs'. Their function is to provide all who want to learn with access to available resources at any time in their lives; empower all who want to share what they know to find those who want

\(^5\) Nicholas Kearney, in his expert presentation to the SIG Pedagogies strand in the Majorca Prometeus meeting (see below), suggests that education institutions should be recast as learning organisations, whose task is to facilitate their members integration into the communities of practice to which they aspire.


to learn it from them; and, finally, furnish all who want to present an issue to the public with the opportunity to make their challenge known."

Illich and both Freire have a reputation as interesting theorists whose theories are too radical for practical application, and display ignorance of the requirements of the economy. They are, however, supported by other writers who cannot be accused of these failings. John Seely Brown, for example, is Chief Scientist of Xerox Corporation and thus well aware of the practical requirements of a modern economy, but he also supports a conversational and community based approach to education:

A community view, we suggest, allows a more rounded view of what learning, all learning, is and how it happens. A delivery view assumes that knowledge is made up of discrete, pre-formed units which learners ingest in smaller or greater amounts and in specialized settings until graduation or indigestion takes over. To become a physicist, such a view suggests, you need to take in a lot of formulas and absorb a lot of experimental data. But, on the one hand, knowledge is not a static, pre-formed substance; it's constantly changing and learning involves active engagement in the processes of change. And, on the other, people don't become physicists by learning formulas any more than they become football players by learning plays. In learning how to be a physicist or a football player -how to act as one, talk as one, be recognized as one- it's not the explicit statements, but the implicit practices that count.

Since the pioneering work by Freire and Illich there has been rapid technological development in the field of information technology. The Internet has made possible the use of computers to mediate social interactions, and this has given rise to a huge number of spontaneous and planned collectives, which are often described as on-line communities. One of the first of these to be open to the public at large was The WELL in San Francisco, founded in 1985 by Stuart Brand and Larry Brilliant in order to connect the writers and readers of the Whole Earth Catalogue. A recent report by the Pew Internet and American Life project has described the current state of on-line communities in the US. Mobile virtual communities are also emerging, principally among young people, and these intersect with the physical world in interesting ways. The Internet is now widely used in education as an information resource, and many attempts have also been made to use it as a platform for virtual learning communities. Indeed Illich specifically mentions that learning webs can be supported by computer technology, and even though he was writing over thirty years ago the model he proposes is very relevant to the search for effective use of the Internet in supporting learning communities.

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9 ibid p.75
There have been some substantial successes, but on the whole the education system has remained largely unchanged. On-line learning communities have tended to be implemented as an additional resource in traditional distance education and life long learning programmes.

To review our discussion so far, the economic requirements of the modern world, as analysed by Senge and Wenger, mean that institutions must transform themselves into learning organisations, and provide support for communities of practice. By the same token, the traditional formal education provided in schools and universities is dangerously out of step with the requirements of the world today. Thus a need has been identified, there are pedagogic approaches based on learning communities which are available to address it\textsuperscript{15}, and there is appropriate technological support available, but nevertheless the education system remains largely untouched. There is clearly a problem to be resolved here, in both theoretical and practical terms.

In the world of business a great deal of attention has been paid to restructuring organisations and redefining the roles of their members, in order to support learning, and communities of practice, with a particular emphasis on reducing vertical hierarchies and encouraging flatter organisational structures. In the world of education, however, the structure of the institutions and the roles of the participants have remained largely unchanged. The reasons for this are systemic, and the tools appropriate for systems analysis are required to understand why this should be the case. One such is the Viable System Model developed by Stafford Beer\textsuperscript{16}, and this is applied to the education system in Oleg Liber's expert presentation below\textsuperscript{17}. To this is added the factor that those organisations which have been successful at adopting the internet as their means of interaction have tended to become hollowed out, reducing their dependence on a physical location and on a traditional administrative hierarchy\textsuperscript{18}. This adds to the pressure on educational institutions if they decide to develop virtual learning communities.

In order to conduct this debate within and between educational institutions, and in society at large, a modelling language is required which can describe the range of educational processes and the resources used in their implementation\textsuperscript{19}. Work is now underway which provides such a tool, and it is to be hoped that this will facilitate the introduction of learning communities within the traditional education system.

\textsuperscript{15} Learning communities are not the only response to the problem. For a summary of an alternative view, see Merrill, M. David et. al. \textit{Reclaiming Instructional Design}. Educational Technology, 1996, 36(5), 5-7.


\textsuperscript{18} See for example Ridderstrale, Jonas; Nordström, Kyell. \textit{Funky Business}, p.134

\textsuperscript{19} The Educational Modelling Language (EML) initiative, which provides a meta-language for defining educational models, is the most significant current development. It is described by Hans Hummel in his expert presentation below, and also in Koper, Rob. \textit{From change to renewal: educational technology foundations of electronic learning environments}. Inaugural Address, Educational Technology Expertise Centre, Open University of the Netherlands. December 2000. Available http://eml.ou.nl, accessed 10th December 2001
3. **Summaries of expert presentations**

3.1 **Overview of the expert presentations**

There was a broad agreement at the meeting regarding the distinct nature of a learning community, as opposed to the broader category of educational systems. Learning communities were described in terms of the types of engagement and norms which prevailed within them. The opening keynote address of the meeting was delivered by Jesus Salinas, and while it did not form part of the expert discussion it is of clear relevance, and a summary of his analysis is available in the appendix to this document. He stressed that all members of the community learn together, valuing each other for their questions more than for their answers, and supporting participants in switching roles between learner and teacher. He pointed out that new skills are required in this environment, where the true expert is skilled in providing guidance for learners in their use of resources, facilitation of learner activity and management of the environment.

The need for systemic change in the implementation of learning communities was the strongest thread in this expert meeting. Indeed this theme did not emerge only from the learning communities expert sessions, but was also evident in other areas of the meeting. For example, Jesus Salinas, in his opening keynote, stated that the Universitat de les Illes Balears had been unable to achieve learning communities because of the constraints of the existing traditional university structure, and the issue also arose in discussions in the Role of the Teacher in ICT thread, and the Learner Models session. The first expert presentation, given by Oleg Liber, provided a focus for this discussion.

**Oleg Liber** employed the *Viable System Model* (VMS), developed by Stafford Beer to analyse the simplifications and constraints which have evolved to deal with the complexity of the problem of providing a mass education. These have led to systemic lock in, and the danger is that educational technology may be reinforcing it. He argued that the traditional structure of education needs to be reformed, for two reasons:

Firstly, we now have new tools available, which have the potential to increase the ability of actors in education to deal with complexity.

Secondly, these structures evolved in the industrial age, when there was a need for a new clerical class. Teachers taught reading, writing and arithmetic, so that the new class could move out of manual labour. A modern economy, however, requires a larger number of people to be capable of working in teams, communicating effectively, solving problems, and continually adopting new skills, and fewer people in clerical work. Traditional formal education does not develop the process skills required by industry. Learning communities with a high degree of self-organisation may offer a way of addressing this need.

Judging by responses to the presentation, both in the session and informally, there was broad agreement with this analysis.

In the light of this consensus that there is a need to reform the structure of educational institutions and processes, it is essential that we have a clear way of describing and comparing them. **Hans Hummel** presented *Educational Modelling*
Language (EML), developed in the Open University of the Netherlands, as a meta-language tool which meets this need. EML is defined as a semantic rich information model and binding, describing the content and process within units of learning from a pedagogical perspective. EML recognises that it is important to focus on modelling activities rather than content, since education is not about consuming content, but rather the instructional problem is a matter of stimulating learning activities by learners, supporting them during performance, and assessing the process outcomes. In EML the ‘unit of study’ is a gestalt, an unbreakable unit which represents all content and processes in function of learning something. It is an abstract term for a designed entity which models the activities, content, tools and workflow for learners and staff to accomplish one or more learning objectives. Within units of study data is structured to reflect its pedagogical functionality, describing entities such as study tasks, tests, learning objectives, prerequisites and tutoring facilities.

There was a great deal of interest in this model, and it was referred to in later discussions as a valuable vehicle for focusing some aspects of our research agenda. Some doubts were expressed as to the degree to which EML could capture all the complexities of learning and learners, but these were not perceived as invalidating the approach.

In the third expert presentation Nicholas Kearney started by examining the relationship between new technologies and the traditional academic community which has gone through three main phases, but without fulfilling the promise of e-learning. He went on to outline the encouraging indications that e-learning can provide real improvements in the learning experience. An important theme in his presentation was the relationship between Learning Communities and Communities of Practice, drawing on work by Etienne Wenger. Learning can be understood as a process whereby learners gradually approximate to the behaviour and vocabulary of a particular community of practice, and learners are accepted into the community when they can participate in the activities of that community. From this perspective a learning community may be understood as a series of Vygotskian zones of proximal development, as the learning community gradually maps itself onto the target community of practice. Knowledge alone is not enough to gain admittance to a community, active engagement and participation is essential. Thus the approximation of a learning community to a community of practice permits outcomes to be held up against the benchmark of the wider community of practice, within the context of the continuous evolution of that community. This approach offers the possibility of effective assessment of learning, in a way that is relevant to the world outside the educational system.
3.2 Oleg Liber, CELT, University of Wales Bangor

The original mission of SIG pedagogies three years ago was to close the loop between users and the European Commission, to enable it to identify more effective funding streams. As a starting point for moving towards this goal we can take the analysis made by our colleague and founder of this SIG António Dias de Figueiredo: “Most current developments in the use of modern technologies in education and training are, unfortunately, to a large extent, little more than relatively naïve transpositions to new environments of the much criticised educational paradigms of the past.

Driven by an invisible force that calls us to the past, we seem to keep putting emphasis mainly on the delivery of information, that is, of content, almost completely disregarding interaction and activity – the context, the completely renewed social and cultural contexts that the new technologies are pleading to offer us.”

These traditional paradigms appeared with the emergence of the industrial age, when there was a need for a new clerical class, although some aspects are older. The task of the teacher was to teach reading, writing and arithmetic, so that a new class could move out of manual labour. There was, inevitably for the period, a production metaphor, with an input of ignorant learners, and an output of educated learners. There was also an assumption that skills and knowledge were predictable and slow changing, and so learning activities were content and classification focussed. Despite major social changes, the paradigm has not changed substantially since then, and a teacher from 150 years ago would have little difficulty in recognising the modern school environment. The naive transposition of this venerable system into a modern technological context, by measures such as placing learning materials on the web, adds no significant benefits, and may even add some difficulties.

The problem is that the complexity of the knowledge environment which confronts learners is far greater than their ability to engage with it, and similarly the complexity of the learner community is much greater than the capability of the teachers to deal with it. Consequently educational professionals structure learning to simplify the knowledge domain in question; but unfortunately, something gets lost in the process. Having established a subject and curriculum structure, learners have to be inserted into it, and consequently they too have to be structured – by age or so-called ability. Many teachers try to subvert the resulting timetabled, subject based structure, but it is what the system offers. The traditional approach does this by dividing learning activities into a hierarchical structure:

• Knowledge is structured into subjects
• Institutions are divided into subject based departments
• Subjects are structured into courses
• Linear curricula are established for courses
• Curricula are structured into lessons

António Dias de Figueiredo, PROMETEUS SIG on Organisational and Co-operative Learning
In order to fit learners into this system, we also have to reduce the range of
behaviours open to them:

- People have to study subjects
- People follow courses
- People are grouped by ‘ability’
- People attend lessons
- People learn content
- People are tested on content before they can move to the next course

The practical systemic implications of this are that syllabuses require transmission,
courses require timetables, and people are partitioned by lessons. However, despite
its depersonalised nature, the system survives precisely because it is so effective in
simplifying matters, and because it has become so familiar that many people find it
hard to imagine an alternative. Teachers and other actors often try to subvert this
model, and a lot of self-organising goes on in the education system, but the essential
structure remains intact.

The Viable System Model\textsuperscript{21} casts light on this system. From this perspective we
can see that the complexity of the knowledge environment is greater than the ability
of learners to deal with it, and that the complexity of the learners is greater than the
ability of teachers to deal with it. In formal terms this may be expressed as $V_e >> V_l
>> V_t$ where $V =$ variety. The education system incorporates structures which
attenuate the complexity at each point. Thus learners are not exposed to the full
complexity of the knowledge environment, and teachers are not exposed to the full
complexity of learners. The end result is that complexity is dealt with by making it
possible to pretend that it does not exist.

The structure repeats itself at a higher level, with courses which do not address the
full complexity of learners’ requirements and desires, and institutional management
which does not address the full complexity of courses needed to fulfil these desires.
At a still higher level, institutions do not represent the full complexity of the
population’s requirements of educational institutions, and government does not deal
with the full complexity of the potential range of institutions within its competence.
This leads to systemic lock in. But now we have new tools available to us, and these
should prompt us to ask a fundamental question. Do we have to carry on doing the
same things in the same way? Or do we have new and better options? As an
educational technologist I fear that, on the contrary, we are simply reinforcing the
traditional system.

The whole hierarchy described above is maintained by a cascade of constraint:

- government constrains institutions
- institutions constrain teachers
- teachers constrain learners

At every stage constraint is based on the assumption that all the actors at the lower
level are essentially the same. Each level establishes a resource bargain with the next
level, ensures that the system is properly coordinated, and monitors that everything is
working as planned. But these are managerial actions, and cannot represent the
enormous complexity of activities that must take place of learning is to happen
effectively.

\textsuperscript{21} Beer, S. (1981) \textit{The Brain of the Firm}. Chichester, Wiley
In order to keep things running a great deal of self organisation goes on within the system at each level, with horizontal communication and coordination between institutions, between teachers, and between learners. Unfortunately, because we never acknowledge or value the self-organising aspects, we do not provide appropriate tools, leaving the actors to their own devices. In face to face situations, self organization can take place through meetings of various sorts. Online, the situation is more difficult. Learners are inventive, and may find their own tools, but e-learning systems may be making the situation more difficult by not providing facilities for these self organised actions by educational actors.

Nor are the results of the traditional education system satisfactory. The prevailing model seems to act on the assumption that education is a matter of delivering content, but the cost of this approach is that a number of essential process skills are not developed, including problem solving, creativity, and conversational and social skills. Consequently the skills which industry requires are not on the curriculum, and when learners go to work, they have to acquire them from scratch. There is also a trend towards overspecialisation.

A structural consequence of the traditional model of schooling is also problematic for the modern age. As Ivan Illich pointed out, there is a hidden curriculum in schools, which is implicit in the structure described above. This includes acceptance of ritual obedience, respect for authority and hierarchy, the assimilation of unnatural groupings structured by age or gender, leading to unhealthy patterns of group relations. The results of this hidden curriculum are incorporated into society at large, and it is to the point that the first thing one sees on entering the house of Lords is rows of coat hooks just like those of Eton, where so many of the incumbents were schooled.

The formal education system is not the only way to learn, nor is it the way in which we do most of the learning in our lives. Informal learning is apprenticeship oriented, with all participants being at different times both teachers and learners, and with no obvious subject boundaries. It takes place within a differentiated context, and involves authentic activities.

The traditional formal model is particularly outdated when one compares it with the dominant paradigms of the (post)modern world. This is a fluid, changing environment, where “just in time” interventions are key, and the requirement is to learn when and what you need. The focus is on knowledge management and individual and organisational learning. This, perhaps unsurprisingly, has had little impact on schools, but it is also the case that e-Learning is, on the whole, not addressing these issues either. This is particularly disappointing when one considers that the particular strengths of ICT, compared with earlier technologies, lie in managing complexity, providing choice, multimedia communication, structuring and modelling.

The system as it stands absorbs enormous resources, and it is not clear that it offers good value for money. We have talked about empowering the learner pedagogically, but we also need to generate a dynamic interchange, empowering the learner organisationally all the way up. We should invert the entire structure, so that

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learners group themselves according to their own criteria, which may include friendship, interests, values and needs. As a result knowledge, experience and age may be varied in these groups, as they are in many informal learning environments. Similarly courses should be inverted. They should be defined by learners’ requirements, not by subject matter, and the pedagogy used should include learner input since learning and teaching are roles which all participants can take on. Such groups do, however, require outside intervention from teachers, who are also learners. Nor do institutions disappear, though they will be transformed into learning organisations. They can facilitate and support teaching by providing a range of services, including

- Resources & content
- Personal information management
- Meeting places
- Laboratories
- Networking
- Legal and financial support for professionals

Illich’s recommendations for an alternative system to the formal education model, made over thirty years ago, include the following:

- Reference Services to Educational Objects which facilitate access to things or processes used for formal learning.
- Skill Exchanges which permit persons to list their skills, the conditions under which they are willing to serve as models for others who want to learn these skills, and the addresses at which they can be reached.
- Peer-Matching: a communications network which permits persons to describe the learning activity in which they wish to engage, in the hope of finding a partner for the inquiry.
- Reference Services to Educators-at-Large who can be listed in a directory giving the addresses and self-descriptions of professionals, paraprofessionals, and free-lancers, along with conditions of access to their services.

A research agenda may be proposed to investigate the line of argument outlined above, divided into two areas:

Research into learning

- How can technology support the formation of learning communities?
- How can personal profiles be used most appropriately?
- How and in what form might online meeting spaces be provided?
- How can technology enable access to expertise?
- How can technology facilitate the operation of learning communities?

Research into organisational aspects

- What alternative ways are available to accredit and validate teachers and institutions?
- What is the appropriate role of government?
- What new forms of funding are required?
- How can innovative institutions be regulated?
- How can we represent the stakeholder interests of people, industry/business, and society?
The role of the EC within this agenda is to support research to develop new technologies that:

- Permit learning communities to form and operate
- Provide appropriate resources and services
- Define new roles for institutions
- Develop a new accreditation model
- Identify new role for state

In this way a long term research agenda will inform short term research actions.

It has been argued that printing led to the disestablishment of the church and to democracy. At the time of its invention, however, it would have been impossible to predict such a consequence. We may be in an analogous situation today, regarding ICT, unable to see the longer term impact. It is possible that the technologies becoming available to us could remove the necessity for the formal education system as it is currently formulated, and may result in a more fluid, dynamic and self-realising set of processes by which people grow and participate in modern society.

Comments from the floor

Comments from the floor suggested widespread agreement with the Oleg Liber's conclusions, although some doubt was expressed regarding the prospects for change in the short term. The presenter agreed that as education professionals we are prisoners of the existing system and that consequently there is an urgent need to establish a research agenda to lead us out this impasse. He went on to say that the key step is for the problem to be recognised and acknowledged. Many people directly involved already do, but not ministers, and not at an institutional level. Another participant suggested that change was inevitable, referring to Papert's observation that once there is universal access to information via the web, learners will find a way to subvert the system. The presenter responded that this could be described as essentially a Marxist viewpoint, maintaining that essential contradictions in the system will lead to its collapse. He questioned the inevitability of this assertion, and also the desirability of such an unmanageable change, stressing instead the need to recognise what is happening and manage the process. He went on to comment that the Internet can equally be seen as a disaster for progressive education, because the computer is no longer used as a modelling device (which it is good at), but as a repository (which it is not particularly suited for). E-Learning can be used to reinforce the traditional content delivery model.

The discussions around this presentation continued well into the night, and the issues it raised were discussed in a number of other sessions, in general in terms of agreement. One strongly dissenting opinion was, however, expressed, maintaining that young learners are not in a position to make choices because they do not have the necessary knowledge, and that teachers must be authorities delivering disciplined teaching. The speaker said that he had seen a deterioration in educational standards since the reforms of the nineteen seventies. Oleg Liber responded saying that the reforms of the seventies had been short-lived, and that today we are confronted by a return to tradition. Rigour and expertise are important, but the killing of curiosity and failure oriented education, and an overburdened curriculum are real problems. What are the systemic reasons why the system has grown to the point that it fails? It is no
use simply pointing at the symptoms of failure. How can we allow people's curiosity to grow? If we keep tightening the lid on the pot until the explosion comes, then it will be louder than we want it to be.
3.3 Hans Hummel, Open University of the Netherlands

The language of flexible learning:

Pedagogy and Technology ... paradox or partnership?

Rosa Maria Bottino said earlier in this meeting that "Technology and pedagogy should not be separate issues but a coherent whole", and here I describe a way of looking at this issue developed by the EML program. Looking at the bigger picture, there is a widely recognised and enormous need for lifelong learning, dual learning and flexible learning. New paradigms for teaching have emerged, and with them have emerged a need for flexible learning communities, which are adaptive in terms of matching the characteristics of learners and staff).

In Prometeus we are involved in a complex process, simultaneously examining the e-Learning process from three angles: technology, pedagogy and organisation. In all three domains we are discussing learner models, but how can we refine the model to build consensus about learner models, and link them to technology? What is lacking is a bridge between theoretical and technological approaches, and between research literature and pedagogy, and Prometeus is in a position to provide such a link.

Within a complex information environment such as this there are entities which are made available for use. In order to incorporate these entities into an information environment they must be labelled and described, and the tool used for this purpose is an education modelling language (EML). There are 30 available in Europe, but no-one knows exactly what constitutes such a language. As a working definition we may consider that an EML is a semantic rich information model and binding, describing the content and process within ‘units of learning’ from a pedagogical perspective. In a semantically poor model everything fits, but with a low level of description. For example the following description may be considered semantically poor:

```
<display>
  <title>
    Learn Skill X
  </title>
  <p>
    Introduction
  </p>
  <p>
    Do test
  </p>
</display>
```

in comparison with the following, relatively semantically rich description:

```
<unit-of-learning>
  <learning-objective>
    Learn skill X
  </learning-objective>
</unit-of-learning>
```
The problem lies in identifying the level of description which we wish to achieve. The relationship between different types of entities (activities in this example) is provided by the XML binding, and a set of grammatical rules which describe the relationship.

It is important to focus on modelling activities rather than content. Education is not about consuming content, rather the instructional problem is a matter of stimulating learning activities by learners, supporting them during performance, and assessing the outcomes (process). Learners should discover learning themselves. When a learner performs a learning activity he/she uses learning content, but if assessment remains knowledge assessment then something is wrong. Indeed, this final element of the process is of critical importance, and it is a coherent strategy to change assessment in order to change learning.

Within EML the ‘unit of study’ is a gestalt, an unbreakable unit which represents all content and processes in function of learning something. Nothing can be subtracted from it without destroying the entity. It is an abstract term for a designed entity which models the activities, content, tools and workflow for learners and staff to accomplish one or more learning objectives. Examples of a unit of study include module, course, curriculum, practical, lesson, etc. Within units of study data is structured to reflect its pedagogical functionality, describing entities such as study tasks, tests, learning objectives, prerequisites and tutoring facilities.

There are hundreds of different pedagogical models, and it is impossible to aspire to the production of standard entities to describe all these models. Nor would implementation of one model be the right direction for general use and standardisation.

A ‘Pedagogically Neutral’ approach is one way of solving this issue, but most of these neutral solutions are actually semantic poor solutions. A better way, however, is a ‘Pedagogically Plural’ meta-model which allows the creation of templates for the different specific models. This uses adaptive parameters, such as active/passive learning, etc. which are capable of describing entities within ranges. In this way we achieve an integrational model which is capable of describing one concrete implementation without constraining a variety of different approaches.

The use of EML is by no means the same as pushing one pedagogical model, as its purpose is to enable us to describe arbitrary existing models in a more formal way. A variety of different pedagogical approaches can be instantiated, e.g. problem-based learning, collaborative learning etc, and pre-defined templates are available to simplify the description process. This makes it possible to achieve

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23 see paper by Rob Koper (footnote 19)
material which is appropriate for all, based on learning needs, previously obtained competences and knowledge, situational circumstances and individual preferences. The framework will be refined over and over again in the light of modelling activity, so we need input from users. An XML repository for EML enables it to be media neutral, and a predefined structure makes for more effective material development. Content management, and the re-use and flexible delivery of information are facilitated, helping to optimise the educational process.

The EML approach is valuable because:
- EML contains all the logic and content of a learning unit, so it allows for real interoperability and collaboration between institutions and industry
- most current specifications solve only parts of the problem, because their designers do not see learning as a gestalt, looking only at metadata, etc.
- learning materials maintain their independence of tools (so they are interpretable without knowledge of runtimes)
- units of learning act as ‘gestalts’ in education, smaller specifications wouldn’t do the work
- most current specifications have low semantics.
- help is provided for designers in validating instructional designs, by providing rich ways to describe learning activities.

From our work with EML a number of questions emerge which could provide the basis for a research agenda:
- Is it possible to subsume all pedagogical models in one meta-model? What is the optimal level of abstraction?
- How can we define and validate binding entities for a VLC, such as a unit of study, environment, (learning) activity, …?
- How can we provide a more scientific foundation for research on L&I (theories and models), and relate these to practical ‘European concerns’?
- Do these binding entities vary from community to community, and if so how?

For example it appears that there are different ways of dealing with an abundance of information in Southern European and Anglo-Saxon countries.

Comments from the floor

A contribution from the floor questioned how the EML model could contribute to knowledge transfer, from one interface to another, in cognitive terms. Hans Hummel responded by saying that cognitive models could be modelled in EML, for example an activity structure can be established which is more generic, such as research hypothesis, data, analysis, and report, with criteria associated with each step. There are general basic skills which can be transferred, general transferable skills. A lot of modelling is going on about content, but the challenge is to look at adaptive models, which can cope with both more general and more specific activities.

Another participant questioned if active learning could be modelled using EML. The presenter replied that a range of approaches had been successfully modelled. Specific resources can be described, or learning structures can be left open, with the student being able to choose. In response to another comment he observed that EML at its
core is a model about roles, and that a facilitator/student can be given liberty to change things, and access to peers for discussion.

A number of participants questioned if EML would be able to achieve universal applicability. In response to the suggestion that EML was usurping the role of teachers and learners in describing what they do the presenter pointed out that a meta modelling language enables everyone to make their own model. Doubts were also expressed as to the ability of the language to address societies as distinct as the USA and India. The presenter agreed that this was challenging, but maintained that it was important to provide structures which could capture the differences.

Another participant suggested that computer scientists, cognitive scientists and practising teachers, had diverging views of what constitutes a model. She questioned if it was possible to model an educational activity from the teacher's perspective as the level of complexity and dynamism is too great, with students, institutions and the world are all changing. Rob Koper, one of the main architects of EML, commented that every setting could refine its own pedagogical models. What is modelled is not the real interactions, because that's not possible, but an abstraction is needed in order to get some grasp on pedagogical models. Institutional models are a separate issue, and far more complex.
3.4 Nicholas Kearney, Florida Centre de Formació, Valencia, Spain

People have always been involved in communities, and more particularly communities of practice, but recently awareness of community seems to be increasing. It is a current buzzword, and advertising, which so often captures sea-change in the way people imagine the world around them, is exploiting the word in campaigns such as that for the Renault Clio. The meaning of the word, however, is not altogether clear. Consider, for example, a particularly resilient kind of community, the academic community.

In this case the community is usually composed of:

- Classes (traditional sage on the stage environments where formal learning takes place)
- Study groups (ranging from formal led discussion to informal conversations in the cafeteria)
- Libraries (where self directed learning takes place)

Universities generally succeed in performing their basic functions: students get their credits, and access to careers, and they usually give the impression of having learnt something. **Today, however, employers increasingly seem to value not so much the qualification, as the experience, the fact that people leave university as socialised thinking adults. The knowledge and skills required today are changing so fast that the qualification does little more than give access to the work environment, demonstrating that a student knows how to learn.** Much of what contributes to students' learning does not take place in the more formal environments within the university, but rather from the social interaction that take place around these formal settings, the largely unplanned benefits of the campus. This is why in my institution, for example, group study rooms are more popular with students than the traditional library, because they offer the opportunity for communication. From this social perspective universities seem to do their job despite themselves, and this is true of other organisations too.

It should also be remembered that the education system, in addition to producing these successful students also generates an unacceptably high rate of failure.

**The introduction of new technologies has impacted on the traditional academic community in a number of ways.** Initially it was largely focussed on reproducing traditional distance learning approaches, faithfully reproducing models of education conceived as a tube for delivering content to learners. The next stage was an attempt to reproduce the traditional face to face environment, but this focussed almost exclusively on the formal learning environment. The technology reproduced this formal structure in the client server approach to virtual learning environments. This presented the university as a repository of knowledge which could be distributed to learners, a Parnassus from whose heights the expert expounded.

A few critical voices were raised to stress the need to include communication, conversation and collaboration, all of them things that happen in traditional educational communities around that formalist classroom hub. The result was the
introduction of additional features in learning environments, such as café spaces and so forth. These are a step in the right direction, but in many cases their functionality is not fully integrated throughout the environment, and they are not as successful as one might have been expected.

The face to face education system is not fully represented when translated into e-Learning, and the higher percentage of dropouts in many areas of e-Learning seems to indicate that they are less than fully satisfactory. The reason may be that dialogue and conversation are intrinsic to learning. Point and click interaction is no substitute for this. The mental processes of engagement, even with a written text, involves a kind of internal dialogue with the author. E-learning, to be truly successful, should reflect this.

In general it seems that the model of education as a tube for delivering content has been found wanting, and teachers are not taking it up. A great deal of money has been spent, but the results have not been what we might have hoped. There are indications, however, that e-learning can provide real improvements in the learning experience, providing opportunities for doing new things that were previously difficult or impossible. For example, asynchronous communication enables us to observe students as they engage with a subject and intervene to aid the learning process in ways that are impossible in formal face to face group contexts. Similarly a study at Queen's University Belfast indicates that it can also promote deeper levels of critical thinking. Unfortunately many of these experiences, based on collaborative, constructivist approaches, have been isolated examples that have not been taken up across the board. For e-learning to truly take off, its special characteristics need to be addressed, so that it can find its own model, rather than trying to reproduce the form of face to face education. We should aim at the same or better outcomes, while bearing in mind that what we are dealing with is a network of non-physical relationships, which is an intrinsically different experience.

Community itself is an elusive term, and there are a variety of descriptions of learning community in the literature, which use a range of terminology. In general, however, learning communities represent a way of strengthening our conversations, and there seems to be a consensus that they exhibit:

- Shared responsibility, with all members contributing to the learning process. There is no one focus of absolute knowledge
- Knowledge is considered to be dynamic, and this leads learners to engage with each other in the process of constructing their own understanding
- Authenticity, with learning situated through experience
- Collaborative activity, in contrast to the passivity expected in more formal traditional contexts

Learning can be understood as a process whereby learners gradually approximate to the behaviour and vocabulary of a particular community of practice. Learners are accepted into the community when they can participate in the activities of that community. They clearly cannot achieve this without being fully conversant with a body of knowledge and skills, including how they

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24 Newman, D.R.; Johnson, Chris; Cochrane, Clive; Webb, Brian. An experiment in group learning technology: evaluating critical thinking in face-to-face and computer-supported seminars.
have been used in the past, how they are currently used, what the burning issues 
are, etc. Knowledge alone, however, is not enough to gain admittance to a 
community; active engagement and participation are essential. 
Thus a learning community may be understood as a series of zones of proximal 
development, a kind of scaffolding, as the learning community gradually maps 
itself onto the target community of practice.

The key elements of the community of practice have been described by Etienne 
Wenger. These stress the social aspect, and in particular the need for

- Positive interdependence.
- Shared Repertoire
- Joint Enterprise
- Mutual recognition

On the basis of discussion in this SIG an additional factor may be added to this list: a 
degree of looseness, authorising legitimate peripheral participation, and a 
heterogeneity of background that is often one of the richest elements, together with 
the idea of a shared space.

Wenger’s research, however, examined a community in the insurance sector, and in 
different learning contexts the repertoire may vary. Mutual recognition may also be 
difficult, with some learners only being interested in accessing the expert, perhaps 
for cultural reasons. Some communities arising out of traditional learning 
environments may also lack heterogeneity.

The learning community seems to fall into a space somewhere between the 
community of practice and the kind of groups that occur in traditional environments.
A series of oppositions can be identified:

**Involvement:** On-going association vs. limited association

**Nature of participation:** Legitimate peripheral participation vs. register/pay/attend 
(implications for business models)

**Extrinsic motivation:** Reputation/identity vs. credits

**Roles:** Sociability vs. receiving instruction

**Relationships:** Mutual accountability vs. authority

**Learning communities are important for a number of reasons**

- They provide opportunities for mediation of some of the processes that are 
normally present but invisible in informal learning contexts, and to an extent 
in formal face to face learning contexts.
- They provide a structure in which to situate learning,
- They have the potential to include a variety of approaches. This includes the 
traditional model, but more importantly offers an unprecedented opportunity

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The Zone of Proximal Development was proposed by Vygotsky in *Mind and Society: The 
Development of Higher Psychological Processes*, ed. M. Cole, S. Scribner, V. John Steiner, and E. 
Souderman (Cambridge, Mass.: Harvard University Press, 1978). It is summarised by Bruner as “an 
account of how the more competent assist the young and the less competent to reach that higher 
ground from which to reflect more abstractly about the nature of things” (Actual Minds, Possible 
Worlds, Bruner, Jerome. Harvard University Press, 1983. p.73.). Scaffolding may be understood as a 
"process that enables a child or novice to solve a problem, carry out a task, or achieve a goal that 
would be beyond his unassisted efforts" (Wood, D., Bruner, J. S., and Ross, G. (1976). The role of 
tutoring in problem solving. Journal of Child Psychology and Psychiatry, 17, p 89-100.)

26 See http://www.ewenger.com/
for experts to participate in shared learning in a social milieu. It thus offers an opportunity to reduce the transactional distance between learners and teachers, to use Moore’ terms\(^\text{27}\).

- They support the target community in their practice in a supportive environment.
- They support personalised learning, though more in terms of the community than the individual.
- Interaction within a learning community appears to support critical thinking that goes deeper than the superficial understanding that passes exams.

The approximation of a learning community to a community practice permits outcomes to be held up against the benchmark of the wider community of practice, within the context of the continuous evolution of that community. This ensures that constructivist practice does not fall into solipsism, and also that individualist approaches are avoided. At the highest level this is established practice in some areas of the university, but unfortunately this is not the target for the majority of learners. This approach sees the learner as apprentice, a link which is explicit in many European languages other than English.

The European Commission has repeatedly emphasised the need for learning to be understood as lifelong learning, but it is not clear that ministries, universities or schools are listening. This has presented a golden opportunity to publishers of generic solutions, which are popular among institutions with the resources to pay the high prices required to cover development costs. There is, however, a strong link between learning communities and lifelong learning, and indeed it is interesting that in the UK the term Life Long Learning is no longer used in some areas, post-compulsory becoming the favoured term. This may be because it is unclear to policy makers how to effectively support the concept of “lifelong” learning as the organisational model that would be an equivalent to school or university does not exist. The concept of “learning community”, however, is more flexible than a model based on existing educational institutions, and offers a way of structuring learning in a more fluid way which can better accommodate the pace of change. The role of the university changes within this context, acting as a bridge to lifelong learning by creating communities of practice in the university which are related to the work outside. In particular the university is well placed to support the critical thinking that is increasingly identified as key in the knowledge society – and which appears to be well supported by the reflective asynchronous communication that characterises learning communities, and to articulate the approximation of its own learning communities to the target communities of the students. The University also has a vital role as the provider of academic validation, at least at present.

The learning community is at present a fledgling and there are a number of areas that would appear to require investigation, and if possible the support from the Commission, and other institutions:

\(^{27}\) Moore and Kearsley: *Distance Education: a systems view* (1996) Wadsworth Publishing
Research areas

A number of priority research areas may be identified from the analysis provided in this presentation.

Creation of learning communities

Investigation into the concept of swarm intelligence, in terms of the development of models which describe the life of learning communities. There are many models available for this kind of development, such as those of Salmon\(^\textsuperscript{28}\), Mason\(^\textsuperscript{29}\), or Berge\(^\textsuperscript{30}\), but they are all apparently derived from face to face processes. This provides a good starting point, but simple transposition is unlikely to be appropriate, and research is needed into specific models for e-learning community lifecycles. Work is also necessary in the development of agent technologies that truly support communities.

Managing learning communities

Much of the literature in the field covers this area, dealing particularly with facilitation, and a lot of good work has been done. The aspects in which progress is most urgent include the following:

- Managing the more informal end of social communication so that it contributes to a sense of presence, something that appears to increase the prospects for successful collaboration.
- The promotion of critical thinking. Asynchronous communication tends toward divergence as threads multiply and reproduce. Consequently it is important to investigate the role of the synthesist, someone who is capable of bringing things together, mapping out discussion, and identifying roads towards the community of practice.
- Managing heterogeneity vs. homogeneity and silence. It is important, for example, to involve and value the legitimately self-directed learner.
- Redefining quality. As the learning community approximates to the community of practice, so the learner approximates to the expert. This suggests that quality can be defined in terms of the way the learner finally functions in the community of practice.

Tools

The idea of e-learning communities has the potential to allow us to do some things better, and most importantly to influence learning processes more appropriately, and


\(^{29}\) Mason, Robin. DEOSNEWS Vol. 1 No. 19. The Distance Education Online Symposium: Moderating Educational Computer Conferencing. 1991

this is the key to the value of e-learning, but this means bearing these considerations in mind in the design of tools, and researching their effectiveness. Tools are important, and the number of dropouts due to people having difficulties with the software should not be ignored. Improved tools need to be developed and research conducted into their effectiveness. Minor details in this context become very important, as was illustrated by a recent questionnaire I administered to people who had been using a CD based tool. They indicated that they rarely used the online support because it meant too many clicks to get to the communication tool. Similarly the design of the tool should put peer communication at the centre of things, not as a peripheral aspect as is the case with most current systems. One hypothesis suggests that the client server model itself is basically flawed, and peer to peer would be more appropriate, and this is an important area for research.

Tools are required which are adaptable, and capable of evolving with the community. The most important factor, however, is that when learners come to a tool they should immediately identify it as a tool for communication, and it should be extremely easy to use.

A number of questions are also raised concerning the relationship between learning communities and the wider community to which there are at present no clear answers:

- Is the learning community concept applicable in all learning contexts?
- Is it applicable at all in conventional settings?
- Is it appropriate for both knowledge and competency-based settings?
- Is it more appropriate in ill-structured domains?
- Does this model imply that we should start thinking in terms of structuring dialogue rather than designing courses?

Comments from the floor

This presentation was the last session of the day, and there was no time for plenary discussion.
4. Adopting a course of action

The central issues raised by the expert presentations, and emphasised in the subsequent discussions, were those dealing with the systemic and organisational factors which impact on the implementation of learning communities. The proposals made are radical in their critique of the existing education system, but they are also pragmatic and rooted in a practical problem: the effectiveness of education, and value for money from the taxes paid by citizens.

If progress is to be made in transforming the European education environment along the lines suggested in this report then a number of policy issues need to be addressed by national and European authorities.

Policy issues emerging from the expert meeting

The course of action recommended by the expert meeting is that the relevant national and European authorities commit resources to:

- Establish the necessary policies and actions to ensure that the benefits of learning communities, and in particular virtual learning communities, are not limited to areas such as distance education and life long learning, but are incorporated into the mainstream of education practice.
- Introduce actions which encourage the use of technology to assist in overcoming a legacy of educational practice rooted in a past socio-economic context, and marked by a rigid hierarchy and the distribution of centrally held knowledge.
- Implement funded action lines to encourage experimentation with self-organised learning communities at all levels and in the whole range of member states.

The debate on these broad questions needs to be carried forward both within Prometeus, and in collaboration with national and European bodies. To inform the process more specific research questions need to be addressed in a pragmatic research programme operating largely through action research.

Research questions identified at this expert meeting

These research questions, arising from the policy concerns above, may be divided into three thematic groups:

The institutional context

- What new organizational structures would be needed to permit expertise to be made available to learning communities, and what institutional changes are necessary.
The management of learning communities.

- Which models are most effective in describing the way learning communities work?
- How can the informal aspects of social communication be managed so that they contribute to a sense of presence? How can an increased sense of presence be used to increase the prospects for successful collaboration?
- Asynchronous communication can tend toward divergence as threads multiply and reproduce, creating a need for some participants to take the role of synthesist, bringing things together, mapping out discussion, and identifying roads towards the community of practice. How can this role be specified, and how can the skills necessary to fulfil it be acquired?
- Not all learners have the same needs within a learning community. How can the heterogeneity of learners be supported? For example, how can the legitimately self-directed learner be effectively incorporated in a learning community?

Technical aspects of learning communities

- What technical innovations in the area of electronic personal profiles are necessary to permit the emergence of self created learning communities?
- What new tools, platforms and infrastructures are needed to permit self organized learning communities to realise themselves? What advantages do distributed services and peer to peer systems have in this respect?
- Can the reform process be facilitated by a common language which describes all sorts of learning, including those which go beyond formal education? Do any educational modelling languages provide a sufficiently powerful meta-language for these purposes?
Annex

Keynote address. Jesús Salinas, University of the Balearic Islands

In his keynote address Dr. Jesús Salinas of the Universtat de les Illes Balears (UIB) analysed the nature of virtual learning communities. He also discussed the UIB Campus Extens system. His address did not form part of the expert meetings, but in view of the subject chosen it is of clear relevance, and so a summary is provided here.

Dr. Jesús Salinas, UIB

There are three basic areas to examine when looking at learning environments.

1. How do we learn in a community. Learning in a community is not in itself new, but the nature of learner's participation in group activities and interaction is transformed, and students have increased autonomy in their collaboration.
2. Advances in ICT and Communications technologies. These have led to new means of communication, which bring with them new types of relationship. Interactive environments for education present us with huge possibilities.
3. Virtual communities. Exchange and cooperation communities using networks create new spaces for exchanging ideas, and support new forms of collaboration. In a virtual community there is information exchange according to rules and in common manner. This information exchange depends on:
   - Accessibility
   - Participation, culture, diversity and sharing.
   - Communication skills
   - Relevance of content, which the community is dealing with.

New technologies offer a framework for a number of innovative types of services. These include:
- Obtaining specialised services of information
- Sharing new knowledge arisen in investigation and professional practice
- Collaborative work in order to improve aptitudes and to solve problems
- Collaboration to create new knowledge

These capabilities may be put to the service of new learning communities, which offer an alternative to the "expert" who knows the answers to all the questions. In these environments questions are an opportunity for collaborative searching, and focusing on "know how" rather than "know that". In such a community of inquirers everyone is invited to be curious, and to value the collective process of discovery. Members of the community are more valued for their questions than their answers.

Learning is inherently an individual process, so learning in a community is simultaneously a social and private phenomenon. Collaborative learning implies peer exchange, interaction amongst equals and the capacity to exchange roles between
learner and teacher. This is a challenging task, and some attempts will fail. Successful communities are those where the members display curiosity, inquiry, and ownership of the community. They are willing to share and work in collaboration, and are confident in experimenting and crossing over political, gender and social borders. For this to occur learning communities should have the following characteristics.

Places where
- An invisible fabric of relationships is tended to and cared for.
- Vulnerability and diversity are welcome
- Curiosity reigns
- Experimentation is the norm
- Inquiry is practised with compassion
- Questions can remain unresolved

The members:
- Communicate honestly and openly
- Demonstrate mutual respect
- Value and seek feedback and interaction
- Are challenged to see themselves in new ways (beyond expert and ignorant)
- Are encouraged to sense, see, listen to, and speak of the whole system,
- Are free to be completely themselves, with no masks

The role of the teacher becomes:
- To guide to learners in the use of information and knowledge databases
- To support learners in becoming more active in the self-directed learning process
- To advise on and manage learning virtual environments
- To access learners’ work in the environment

There have been many trials of learning communities, but we still have a lot to learn. In the UIB it has not so far been possible to achieve learning communities, because we are starting from a traditional university structure. The true expert in this field will be the expert in guiding interaction and knowledge management, rather than the content expert.