

# Portal technology for learning communities

## TECFA::SEED Project::Working Paper 2 - Version 2(draft)

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### Abstract

This paper addresses several issues regarding portals in the SEED project. Of particular interest to us are community portals that are based on relatively simple collaborative information portal technology. *This is a sort of “brainstorm” and “overview” paper* and does not necessarily focus only on research questions that we will pursue within the SEED project. Note that this paper addresses issues both for our own work within WP1 (activity design) and our contribution to WP3 (center for collaboration and exchange), but it can be distributed to a wider audience.

Our main interest is geared toward “electronic communities” of people involved in the educational process. We will look at different forms of communities and how they can be networked together. The rationales behind this are twofold: (a) Optimal learning needs community besides pedagogy and educational contents. Some community building can be achieved through the organization of collaborative activities, other can be fostered by more general computer-supported community building strategies. (b) Innovative teachers are more productive through peer support, i.e. within a learning community providing support in various areas.

Simple portal technology can be used to implement some interesting collaborative learning scenarios by providing content management and communication tools and we will shortly outline some of the possibilities.

Within the last few year we have seen a big proliferation of so called educational learning platforms. While easing many tasks, these platforms don't really foster new pedagogies, but rather favor old-fashioned (and often badly implemented) instructional content modules. In addition, they don't foster community building as much as they could. We would like to show that alternative technologies for managing pedagogical web sites exist.

Finally, in this paper we would like to open a few research issues that will or might be further elaborated during the SEED project.

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## 1 Introduction

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### 1.1 Community portals in education

Currently, in the world of formal education, community portals do exist but are not predominant. The two most popular kinds of portals used are either central information portals for the school (e.g. campus-wide information systems) or pedagogical platforms that operate on the class level. None of them are usually built as community portals, although some do support tools like forums.

There are many arguments that “community building” greatly enhances the learning experience. As formulated by e-learning practitioner Gilroy (2001) “E-learning should be first and foremost about creating a social space that must be managed for the teaching and learning needs of the particular group of people inhabiting that space”. Instructional design should focus on interaction, collaboration and more general exchange of ideas. Part of the interest for learning communities also stems from the fact that open and informal learning that takes place in particular among software developers does rely at least in part on some “community spirit” and on traditional or more sophisticated Internet community tools.

Community building and support becomes also a very important issue in educational reform. Internet has brought to life many computer support teacher communities who share teaching materials, experiences and other things. Many of these communities sprang up spontaneously but their potential for teacher development has been recognized and officially supported web sites like [www.educanet.ch](http://www.educanet.ch) start offering community

support tools to different groups of teachers.

Within the SEED project, the TECFA team will support teacher, learning and mixed communities at conceptual and technical level, i.e. by conceptual and technical support for setting up and running community portals.

## 1.2 The problem with educational platforms

E-learning as understood by too many decision makers and as “sold” by too many “specialized” software companies is about accumulation, organization, and piece by piece controlled delivery of content.

“The emphasis of most e-learning programs to date has been on the accumulation, organization, and delivery of content. This is manifested in all aspects of how the new sector has been organized: in the business and operating models of the service and technology providers; in the design and organization of the content and learning management systems that are now widely used; and in the investments venture capitalists, publishers, universities, and corporations have made. (Gilroy 2001).

Let’s have look at several biases being propagated by current pedagogical platforms:

Bias #1: “Course Ware is central to education and it constitutes the institution’s principal financial asset”. While in many places content is hidden away from world, others have understood that a lot of information exists for free on the web and that it does not hurt to share it with others. MIT’s “OpenCourseWare initiative” clearly recognized that educational contents are not as central as pedagogical platforms make us believe. Central is what one does (learning) and what someone makes students do with contents and other learners (teaching).

Bias #2: “Learning comes from planned activities”. While a large part of our knowledge comes indeed from formally planned classroom and study activities, people learn a lot from informal exchange with fellow learners, with professors, experts, i.e. from exchange within tightly or loosely defined communities.

Bias #3: “Instructionalist behaviorist learning is appropriate in most situations”. In industry in particular there seems to exist the belief that all e-learning needs is a flexible combination of little reusable learning objects, combined of an entry test, some content delivery and a exit quiz. In reality education is more often about teaching people to solve more complex tasks, i.e. engage them in problem and project-based learning.

Hiding contents, isolating students from context, and misunderstood instructional principles are three major sins in the world of e-learning. We believe that these are reinforced by the architecture of educational platforms and that we therefore must look into other technical solutions.

## 1.3 Lines of research around “portals”

TECFA’s research around portals is to be conducted along three separate tracks, which gradually will be integrated as the project progresses

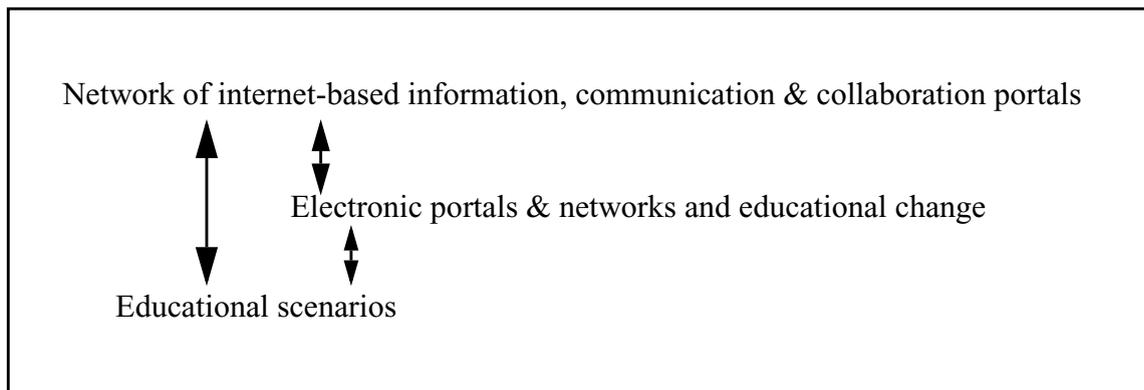
- 1 The core track concerns community building and implementation of a network of internet-based community portals to support educational communities in several locations and configurations.
- 2 In parallel, a second research track concerns educational scenarios, i.e. we will

involve these communities in defining educational scenarios, some of which make more or less direct use of simple portal technology.

- 3 Finally, a third research track will study critically how and to what extent the use of electronic portals and networks can contribute directly or indirectly to behavioral change with students, teachers and parts of the school system.

Graphically, the articulation of these three research tracks can be presented as follows:

*Fig 1. The 3 principal research tracks on community portals*



A set of more precise research questions will be presented in later sections.

## 1.4 Definitions of “Community”

On a more micro-sociological level we can define communities as follows: Communities are networks, made up of individuals as well as public and private institutions. They share a certain amount of practices, common goals and common language. They do have a social organization including formal or informal hierarchies and some idea of “social service” (members helping each other)

On a macro sociological/political level communities can be considered as problem-solving mechanisms which contribute to establishing policy agendas and offer mechanisms to facilitate processes for negotiation between different actors. They help develop and disseminate knowledge that is crucial in addressing the challenge of educational change, they may even come up with innovative mechanisms for implementing new strategies.

Beyond such abstract definitions, “Community” is quite an ambiguous concept that encompasses, for example, communities of practice (e.g. teachers from a same school or teaching similar things), local communities (people living in the same area) and virtual communities (people sharing some information on communication space on the internet). “Virtual” therefore makes more reference to the fact that people’s communications are mediated by the computer rather than to the fact that they may live in different locations.

In this paper when we use the terms “community” or “community networks,” we mean loose or tight communities of practice using the functionalities of specialized internet portals, providing collaboration and information tools. Several communities can be linked together by networks of such portals. In other words: There exist different sorts of communities and communities can overlap in various ways and some of this overlap can

be fostered by technology. [Note: The term “network” needs some clarification.]

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## 2 Community networks

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### 2.1 What are communities

One of the main strategies to implement the SEED project successfully is to develop, at a local level, networks and partnerships among stakeholders, i.e. teachers, researchers, teacher trainers, and also learners to some extent.

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[This part needs to be developed, in particular:

- work “Definitions of “Community”” on page 4
  - use input from Dillenbourg (2001, to appear)
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### 2.2 Fostering electronic communities

New communities bringing together people from different locations are difficult to build and to maintain. Some of these networks will be fostered and nurtured by means of so-called “Defining Events” (in particular within the educapoles project) and sustained by internet-based communications networks.

Distributed internet-based communications networks have interesting and proven potential for developing local learning community networks and partnerships. There is substantial scientific and “practical” literature on community building in the western world. Based on the classic work on local communities (e.g., Etzioni, 1993), there are a number of interesting studies of networked local communities (e.g., Schuler, 1995 & 1996) and virtual communities (e.g., Rheingold, 1993).

The debate on how to foster sustainable communities with the help of networking technology is still open but there are now generally accepted principles which we will outline below. Conclusions like the ones that can be found in the Morino (2000) report on digital divides (i.e. “difficult situations/communities”) are of some interest for this research:

- Building effective networks requires far more than placing a computer in front of every participant. The change occurs when individuals come to understand the potential of technology and acquire the skills to use it.
- Technology initiatives imposed on a community by outsiders are often ineffective. As a result, those who hope to promote the use of technology in low-income communities should devote a great deal of time to identifying and then cultivating relationships with key local leaders and organisations.
- Investments in technology must go far beyond funding for hardware, software, and

wires. For most projects, no more than one-third of the funding should go to technology itself, leaving more than two-thirds for developing programmes that help people and organisations understand and apply the technology.

In other words, technology is effective when people have been trained in how to use it, when users are directly involved in its design and when key actors can be convinced to participate. To this list we can add that

- Building communities of people from the same area, who know each other, who have worked together before towards a shared vision in the same physical location (goal finding event) significantly increases the chances of success. Therefore, “Defining Events” must be carefully planned to include familiarization with new technology.

Such guidelines are hardly surprising and should be applied to any sort of community building process involving technology. There also exist design lessons from modern information community and business portals (i.e. loose communities of practice) from which we also can draw lessons:

- Individuals tend to participate if some sort of payback exists and is perceived (pair recognition, for example). The portal can, for instance, index contributions of people and implement ranking systems where participants can judge the usefulness of messages etc. Such systems are quite popular in informatics (e.g. site likes advogato and Slashdot) or in e-commerce (e.g. Amazon).
- When participant-generated knowledge (postings and discussion) is leveraged with simple knowledge tools (e.g. indexes or FAQ compilations), participants will return again because, for example, they feel that their contributions are not lost. In addition, passive participants will first consult the knowledge base, before asking questions and therefore the quality of and the interest in the discussion will rise.
- A lot of attention must be paid to the interface, which must accommodate users with various levels of expertise and types of involvement. It is not clear how to achieve portals that help beginners to become quickly active or even power-users. Studies have shown that most portal users don't know how to use its advanced features (Carles 01).
- A portal should serve the needs and aspirations of all its stakeholders: visitors, regular users and active members. For example, up-to-date “news-to-use” from the cutting edge of a subject or topic important to the community should be provided by regular contributors.

Some of the above statements should be reformulated as hypothesis to be tested in this research, since they do not rely (to our knowledge) on serious and systematic research.

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### **3 What are information, communication & collaboration**

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## portals?

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### 3.1 Portals

Portals became very popular since 1999 and became the “hot” Internet Application in 2000. Of particular interest to this project are various sorts of “micro-portals”, e.g. Weblogs and user-participating Information portals à la “Slashdot”. Many other varieties exists, e.g. particular collaboration systems, more traditional group & workflow systems like Notes and Zope. We also should mention so-called “pedagogical platforms” (e-learning, WBT systems in which we are not interested in this context).

There are three main types of portals:

- 1 Information: news, weblogs, customer support
- 2 Transaction: sales, auctions, ...
- 3 Collaboration: (weblogs, news) + discussion

We can also look at the “orientation” (not really orthogonal categories)

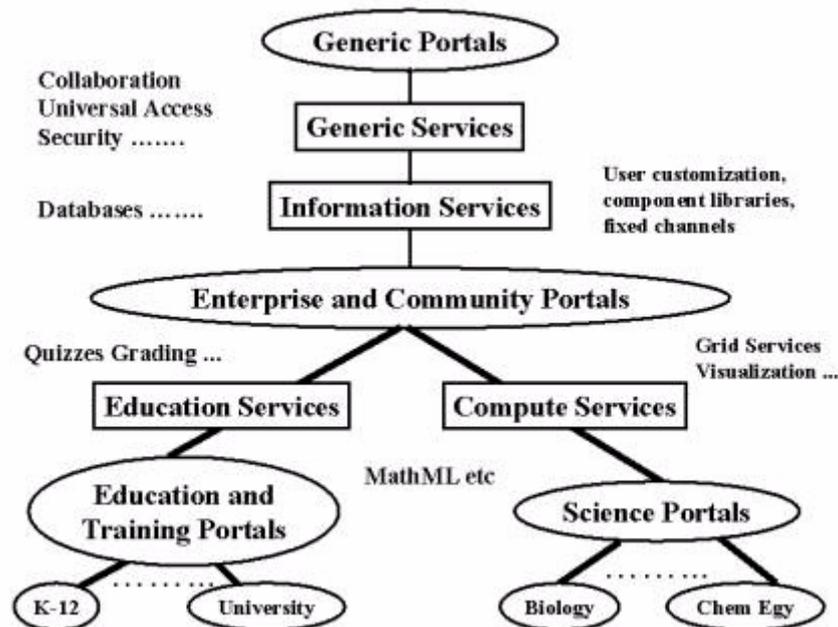
- 1 vertical: (e.g. a community)
- 2 horizontal (e.g. data analysis people)
- 3 geographic / tribal /corporate / etc.
- 4 network of portals

In a very general way, portals can be described as follows:

“for a given area (community, the abg corporate EIP, the XYZ University Education Portal etc.) there are a collection of objects and services (operations on objects) which can be accessed from the portal (web page). One can often customize the portal functionality, choosing both, which objects to display and their parameters (which sports team score to display or which area weather map). Similarly the look and feel of the portal, background or index style, can be customized to get <my.portal>. Both the basic portal objects and customization for each user must be stored persistently” (Fox 2000)

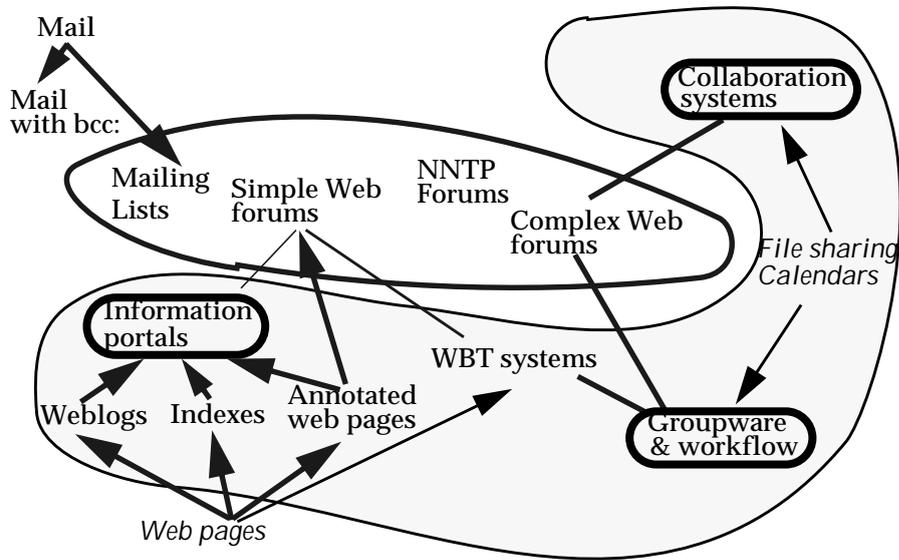
Portals can be classified in many ways. Figure 2 by Fox (2000) shows specialized features of educational platforms and science portals

*Fig 2. Hierarchy of Portals and Their Technology (Fox 2000)*



We also can classify portals according to certain features. E.g. in figure 3 we look at the relationships between standard Internet Communication tools and various more complex web-based applications. As this figure implies, portals are technology that has derived from several sources and that combine several features found in more simple applications. In a way portals are web technology implementations of a distributed system, i.e. it's an interface to tie together various services. But they are more, e.g. in our opinion collaborative information portals successfully managed to combine discussion with information.

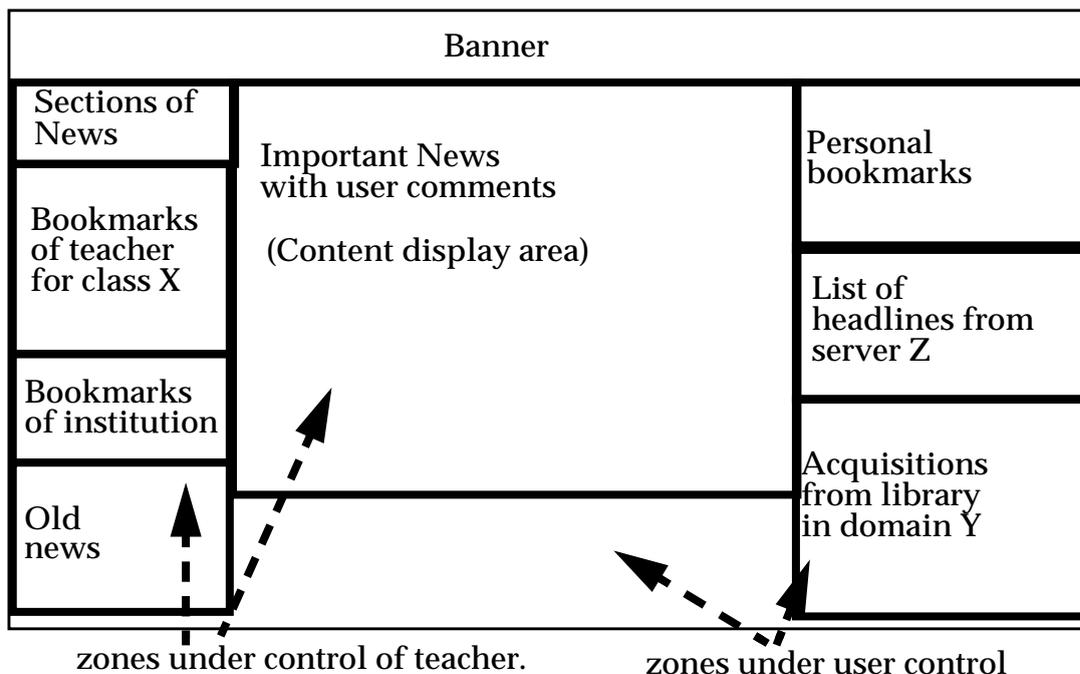
**Fig 3. Information portals and other CMC systems**



### 3.2 Information portals

Let's look at the structure of a simple and typical collaborative information portal:

**Fig 4. The structure of a simple information portal**



Such a portal is gateway to information maintained usually by several actors. Many

portals allow users to submit stories on which generally everybody can comment. Some “boxes” can be used to display headlines from other portals or for short informations of others types. Many portals can be configured according to user preferences.

### 3.3 Weblogs

Weblogs are an interesting variety based on simple principles according to Ashley (2001):

- A weblog, also called a blog, is a web-based writing space.
- Think of something like an on-line journal, a web site an individual uses to write everyday, where all the writing and editing,
- and the whole look and feel of the site, is managed through a web browser from wherever the writer happens to be.
- A weblog is designed so that, just like a journal, the page can be turned each day, and the web site itself keeps track of the date and archiving of all the writing.
- ... most recent weblogs have other features, a lot of other portals have weblog functionalities etc. (see later)

Weblogs have been used as simple community tools for years, but most often (at least the simple variety) is managed by an individual who in sort uses to build a portal around his persona and daily experiences or his professional activities and interests. Some uses of Weblogs in education have been reported, e.g. Ashley 2001.

The borderline between simple Weblogs and more sophisticated information portals and more generally content management systems is difficult to draw since most of today’s information and community portals somewhat rely on the idea that users will be attracted by a daily news feed. An example of a free weblog is *phpWebLog*. A good commercial product is *Manila*. A site that hosts Weblogs is *Weblogger*.

### 3.4 Common features of simple collaborative information portals

“Simple collaborative information portals” are in our own terminology portals that can be easily installed and maintained and the offer both information and collaboration features. Typical examples are *thatWare*, *Drupal*, *phpWebSite*, *PhPNuke*, *SlashCode*

Basic features

- Easy, web-based administration - minimal computer experience is needed to maintain site content.
- Flexible layout control - site page layout can be changed at anytime
- Topic-based announcements - organize site announcements by category with automatic history rollover.
- Interactive content - visitors can post comments, submit articles, announcements and web links.
- boxes for headlines from other sites (via RDF imports)

- boxes for other information

Additional (some of it is basic groupware stuff)

- Surveys and polls - create “quick look” surveys using a few mouse clicks.
- Full featured event calendar - post events by category and subcategory in a flexible cross-referenced calendar.
- Customized user experience - themes allow each visitor to customize the web site for his or her preferences or special needs
- File upload/download
- Headlines export / import from other sites (news syndication)
- standards compliance (in particular news syndication formats)  
multiple client support
- Share glossary to help sharing a common language
- API support

....

Typically, some of the more complex information portals like phpNuke or SlashCode are almost as easy to install and to configure as simple Weblogs, but offer typical groupware and CMS functionalities. But they do not “suffer” from the complexity of typical application portals like LotusNotes or iPlanet. Many large and loose Internet communities now make use of Portal technology, but their use in education seems to be restricted somewhat, and most uses are for campus portals. Note that some initiatives exist to create portals to support educational communities, e.g., uPortal from JASIG, while other vendors of sophisticated portal software like ArsDigita (Meeks 2000) or DigiOnline explicitly target education as market

### 3.5 Provisional List of interesting systems

Within the next few month we are going to test in more depth a few systems

- 1 PhPWebLog
- 2 PhPWebSite
- 3 PhPNuke
- 4 uPortal

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## 4 Some research questions

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In this really unfinished section we outline a few research topics. “learning” both in terms of “teacher learning” (rather group open learning) and “student learning” (rather collaborative learning scenarios) needs to be developed some more here. See

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Dillenbourg (2001, to appear)

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## 4.1 Some general questions on community building

The intellectual challenge here is to understand how we can use technology for network and community building in education (students, teachers and other involved persons). Since community networks are an attempt to use computer network technology to address the needs of the community, we could focus the question on how we can make computing and networking facilities available to everybody in a community. While this is an interesting question, our main thrust is aimed at exploiting existing infrastructures (actors having network access at home, in school, at work or even in cyber cafés) and we wish to ask questions like:

- Can we use portal technology and associated strategies (that have proven to be successful with computer professionals, commercial portals or even low-income community activists in the western world) to foster networking and collaboration within actors in education? Research (e.g., Carles, 1999) suggests that learning how to use the internet actively is a more difficult challenge than generally believed.
- Can we transfer Scandinavian (Grønæk, 1991) user-centred design strategies? Or, being convinced of the general benefits of participatory design, how do we have to design an effective implementation process that takes into account specific needs for this project (distance between actors, time constraints, political structures, technical infrastructures, etc.)?
- How can we provide sustainable networks which must provide, update and manage content. It is difficult to define in advance the minimal acceptable level of knowledge management (organization and retrieval of informal knowledge). Expensive solutions are not sustainable on low-funded operations and low cost solutions (e.g. simple indices based on word counts of messages) are tedious for the users.
- How can we use portal technology to support key ideas of this project: to leverage best practice knowledge from networks, to help in disseminating and challenging ideas across communities and to integrate distance learning concepts with scenarios for community learning?

Building sustainable virtual communities is very difficult. We can learn a few things from other technology-enhanced communities of practice, but there are still many open questions. We already pointed out that small communities of interest, made up of people from the same area, who know each other and who have worked together before towards a shared vision, in the same physical location, (goal finding event) seem to work. There are also successful communities of enthusiastic specialists who share work interests over wide areas and across nations and cultures. So, an interesting question is to discover how to combine these “area/vertical” and “topic/horizontal” configurations. In order to raise the quality of area portals, opinion leaders must also participate in topic-oriented (horizontal) communities. Bringing people from various locations and with various interests together is probably a task that must be managed or at least initiated by a central team, but without being too intrusive. We hope that flexible and distributed internet technology, allowing the creation of an interconnected network of community portals, can be a key element for such an enterprise.

The key to answer the above questions lies in a careful analysis (and definition) of

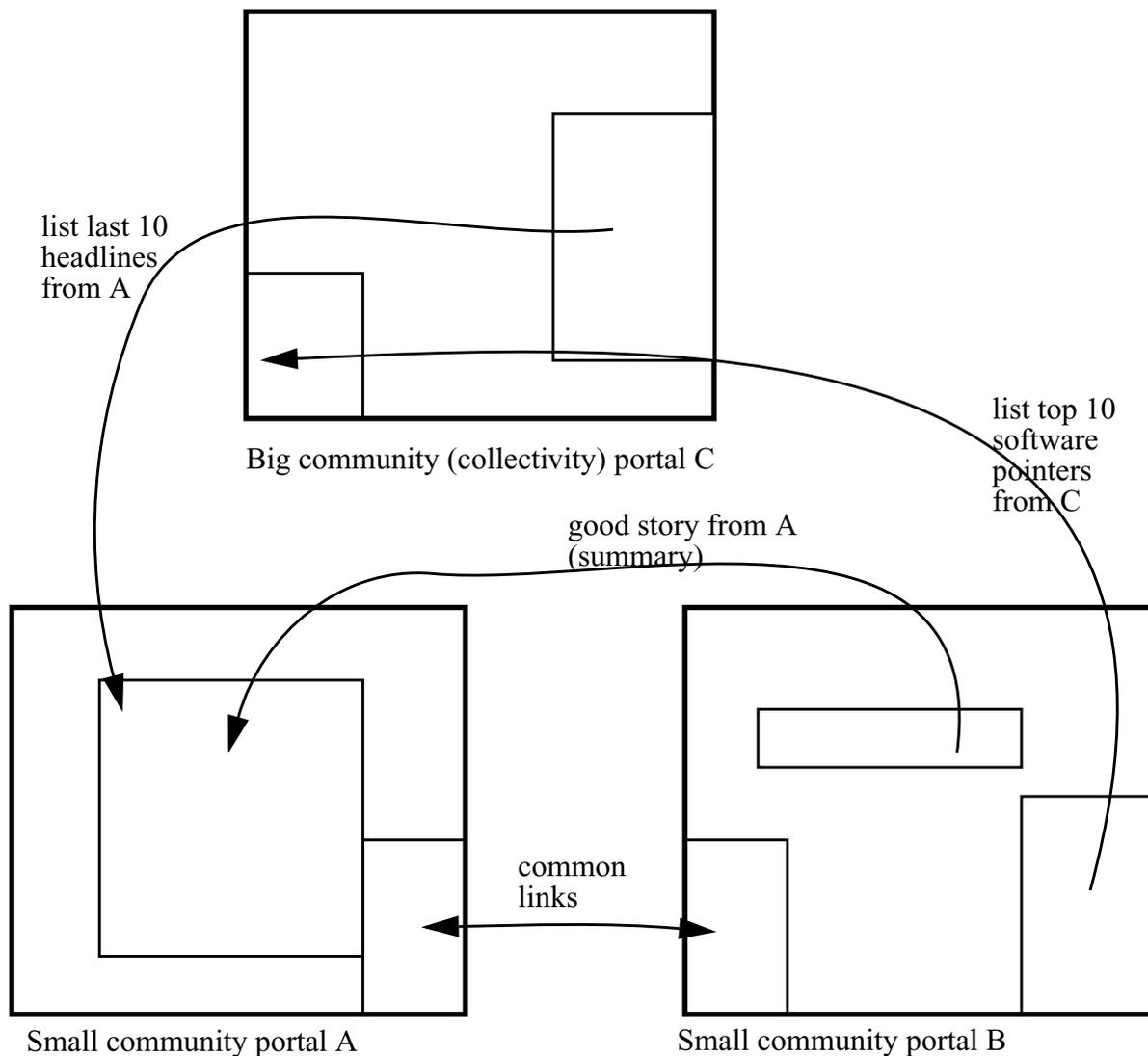
community. See “Definitions of “Community”” on page 4. This needs to be coordinated with work on “small scale implementation”

Finally, we must address more general question: whether, what and how communities have learned, what role existing networks and partnerships have played in such community learning. what the most effective networks and partnerships in community learning are, etc.

### 4.2 Networks of virtual communities

As we outlined in the previous section, it is probably a good strategy to build larger communities out of smaller ones and in turn to nurture smaller communities from larger or overlapping ones. There are many interesting conceptual questions involved, e.g. how to build common “things” (goals, languages, etc.) or at least a culture that allows people to get ideas across.

For now we will just sketch out some functional requirements of a portals network that could sustain such a social architecture.



Information sharing between portals, i.e. web syndication in various ways is the minimal

functionality we need. Many of today's popular information portals export information in standardized formats. We need at least support for headlines exchange, e.g. with the RSS standard supported by thousands of website. In addition, we can imagine APIs that allow friendly portals (and other clients) to tap into information structures (including communication threads). In order to make this work, we do not need big monolithic servers, not even the same portal software. However they need to support certain standards (see "Technical Issues" on page 16)

### 4.3 Seeding larger communities

We believe that the most effective networks are local, but there are also examples of successful larger networks or people, e.g. professional support groups. Larger groups also have a longer survival rate, even if they can't be claim to be "real" communities. We'd like to make the hypothesis that we should network networks or in more technical terms build portals that cross-feed important information both horizontally and vertically.

Building effective virtual communities at the local level calls for technology at 2 levels. First, we need to support local key actors, i.e. mainly teachers. Local opinion leaders and main actors (once they are identified) must be able to get advice for difficult tasks at hand (e.g. strategic questions) and particularly from peers having found solutions or at least better questions for similar problems. In particular, local key actors must receive support from a global network. Local networks should actively involve natural communities of teachers with their teaching work but stay connected to the "rest" of the world or at least some larger and looser community.

In order to seed information to larger communities we therefore also need a web site that allows people to communicate in various ways will provide some essential leverage. Even such sites can be called "community portals" (In the business world we talk about "enterprise information portals" or application portals if other online services are provided). Particular attention has to be paid to make it an efficient medium. Typical "propaganda" style architectures (e.g. some of the ones produced by some big companies or organizations) are not productive. Our model must be inspired from interactive successful e-commerce sites (like Amazon), commercial information portals (like Yahoo) or (and mostly) successful information and collaboration portals for the many informal communities of interest that thrive on the Internet. Most successful Internet sites depend on an active community of users and allow them to actively participate not just in discussion but in content creation and content rating. Therefore we also should have a closer look at commercial sites

Now, let's look at the users of a "loose and large" community site. Typically one could classify these "clients" into:

- 1 Surfers: people just looking at it sometimes
- 2 Information seekers: people seeking answers
- 3 participants (questions plus answers)
- 4 leaders (highly visible on forums and other channels)
- 5 moderators (keep it going)
- 6 technical & conceptual support (not just at start phase)

We must turn 1's into 2's then 3's. We also must convince some 3's to be 4's and 5's, that's the global issue besides attracting enough people to "it". The trick is if there is enough active collaboration (from the right people of course), there will be emerging solutions for whole community and therefore reinforcing it. Providing information and technology must be geared towards enabling a community to solve its problems by themselves (with the help they ask from us).

Research question summary: How can we build sustainable community portals that actively engage local communities into collaborative learning experiences. How can we also insure that there is communication across communities, e.g. that "foreign" best practices or most difficult problems are discussed at a global level?

Putting it simply: It is quite easy to have friends talk to each other or lonely and eager specialists. Proving sites where some experts answer questions coming from some larger audience also can be done. Highly animated and moderated portals do work (at least on the surface). Stimulating sustaining inter-group collaboration geared towards finding and implementing ecologically (local) valid solutions for educational problems is an altogether different matter and worth a research project.

#### 4.4 Educational scenarios with portals

Community tools first of all target motivation. If we can manage to create a real community - not just students using Internet tools because the teacher told them so - we can create strong social dynamics that catalyze participation, collaboration and exchange and even increased investment in individual work. It also can be a vector to transmit a culture (i.e. spontaneous collaborative learning) or foster a sub-culture with its own references, i.e. social constructs feeding back into motivation.

While portals are an interesting tools for community building (and teacher's communities in particular), they can be used to support more explicit teaching scenarios which not necessarily need to rely on the kind of community spirit we find in active virtual teacher communities.

Typical educational collaborative or collective scenarios that can be given support from collaborative information portals are outlined in TECFA Seed Working Paper 1: A framework for authoring CSCL scenarios. A standard portal can not provide as much support as we plan to implement with our "Virtual Studio" project outlined in working paper 1, but it can help. In particular, we can support methods such as

- collaborative (sequential) writing
- discussion
- votes
- file sharing
- expositions

However, the teacher has to assemble these elements "manually" into a coherent educational scenario and use "classical" tools (classroom instructions, mail and forum messages and web pages to coordinate). Furthermore, advanced activity visualization are not available of course.

## 4.5 Knowledge Management

Knowledge management has become an important buzzword in the last 2 years. Good knowledge management (KM) will be instrumental for open e-learning and community of practice building. However, there are problems and open questions that current hype doesn't solve. KM has existed in other variants before (Management information systems of the 70', expert systems of the 80', data warehousing of the 90'). Some problems remain the same, like sorting information or transferring information from one context to another.

Let's just look at the problem of supporting information gathering, by either student or teacher:

- finding information that exists (easy, just hire a web master to upload everything and pay people to produce learning materials),
- finding information the exists but is hard to find or not formalized (difficult, we need knowledge management),
- finding information that does not exist but is easy to produce (difficult, we need discussion forums that are stimulating enough for experts),
- finding information that does not exist and that must be created (very hard, we must bring people to work together over Internet.)

KM promotes just-in-time open learning, i.e. people can interact with a knowledge base when they need information from it in order to get some job done. Learning is always situated and meaningful. Of course the better the knowledge base, the more successful learning will be. Recent development e-learning frameworks are centered around a "reusable learning objects" (RLO) strategy (Cisco 2000). Reusable learning objects are information units (or data or knowledge objects) that encapsulate a small learning unit (e.g. dealing with a concept, a procedure, a heuristic) together with some meta data (including subject, author, how and when to use it). In other words, an RLO is a more "polished" piece of information than an element in a KM database. Ideally RLOs can be contextualized and repurposed, i.e. selected and combined according to particular needs. But research in phenomenology (e.g. situated action research) suggest that this may not be so simple.

So an important research question is how to build combined community, knowledge management and e-learning systems. We don't know clearly how we must structure RLOs and how we can automatize RLO abstraction from more informal content or at least build discussion/information portals that provide each participant with the facility to create RLOs easily. Probably there won't be a global answer, but by building operational systems that implement some of this functionality we may have some answers to these fundamental research questions. It is probably safe to state that we rather must use successful industry and community practices (and particular the ones that are not tagged with e-learning and knowledge management) in order to determine good technical starting points, e.g. DITA for the information structure and Slashdot alike news and discussion portals.

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## 5 Technical Issues

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Information and community portal technology has become very popular and is widely used in various situations, e.g. within loosely organized “internet communities,” for internet news portals (both commercial and non-commercial), as add-on to e-commerce sites, etc. Features supported by this technology include: web-based site administration including support for boxes and blocks, content management of stories, polling, news syndication with other sites, threaded discussions, information that users can rate and filter and submissions that can be subjected to approval, etc. (Jepson 2000). For this project (at least for its initial phase) we plan to use and adapt an “open-source”-based toolkit to our needs. Several reliable environments (e.g. phpWeblog, or Slashcode) are available (see: <http://tecfa.unige.ch/guides/portals/pointers.html> for a list). In addition to usual features supported by a typical information and discussion portal, the selected environment must respect the following criteria:

- Open source code allowing the addition of functionalities
- Standards compliance (SQL, XML for data exchange)
- Support for APIs like XML-RPC Blogger
- Support for some news exchange and syndication standards (e.g. NITF, News ML, RSS)
- Multiple client support (web browsers, PDAs, mobile phones)

We do not expect any major technical difficulties during the start phase of the project. Adapting portal technology to various technical and social conditions and the particular goals of this project will however raise challenges. Of particular interest are the following questions:

- How can we build a network of information portals that can accommodate various instances of control and still guarantees free flow of information?
- How can we integrate/design knowledge management tools that support collective learning?
- How can we integrate tools for structured learning needed and wanted by some teachers and marry them with the more “open learning” philosophy of such portals?
- How can we integrate tools like the virtual studio or Eva\_pm which are more advanced CSCL tools ?

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## 6 Research design and methodology

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Basic systems design philosophy will be inspired by participatory design (Kensing, 1998) and rapid prototyping (Grønbaek, 1991) methods. This means that we will deploy software as soon as possible so that users (mainly teachers here) can participate in the

design from the beginning. It also means that we will not just manage one central portal, but that we will help in deploying portals to each community of actors that wishes to manage one. Such local community portals can be hosted locally or at TECFA's site. The only constraint we wish to enforce is a negotiable amount of information flow (headlines, news and other content syndication) between members of this "portals network". In technical terms this means compliance with a news exchange standard and an API for client access. The distributed network of information portals tightly or loosely associated with the "open source" community has shown impressively the technical feasibility of this endeavor and will provide the initial tools.

Work on community portals will be tightly integrated with the rest of the project at all levels where Portals are being built and used (WP1/2 and WP3).

Methodologically we will proceed by analyzing portal contents (both this project's and those of other portals of interest) and by participant observation and interviews, i.e. essentially by means of qualitative research methodologies. Details will be added in a further version.

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Schulen ans Netz: <http://www.san-ev.de/>, a German initiative that includes Information and collaboration platforms

educanet.ch <http://www.educanet.ch/> Swiss teacher's community platform (from educa.ch)

euca.ch, <http://www.educa.ch> Swiss education portal sponsored by federal and cantonal authorities