

"myNetWorks.org" – a Rich Collaborative Web Environment for Sustainable Environmental Technology

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1. INTRODUCTION

1.1. The project: background, aims and target group

"myNetWorks.org" will be a rich collaborative web environment to convey basic principles, course materials and approaches to problem solving in the areas of Sustainable Environmental Technology and Ecological Engineering. "myNetWorks.org" is created in collaboration between the Swiss Agency for Development and Cooperation (SDC) and the International Ecological Engineering Society (IEES).

The main focus of "myNetWorks.org" is to facilitate exchange and nurture and sustain a virtual community of practitioners and academics, without following a one-sided technological viewpoint. Social and economic aspects will play an important role alongside the technical and ecological aspects. An important issue is to promote collaboration and exchange between developing and developed countries. The project aims to build up a resource for further education.

The target groups of "myNetWorks.org" have been defined as follows:

- Engineers, technical experts in developing countries
- Administration, government departments in developing countries
- Teaching staff and students at educational institutions (including colleges)
- SDC coordination offices, project staff and partner organisations
- Consultants working on behalf of the SDC and of other development organisations
- Non governmental organizations in developing countries and developed countries

1.2. The context: Ecological Engineering

Ecological Engineering (EE) as a field within the Engineering Sciences is a rather young discipline. In the Western World, it was started in the late 60s by pioneers of the environmental movement. Yet at the same time it is an old field that builds on hundreds of years of experience in South and East Asia.

EE has been defined as the "design of sustainable systems consistent with ecological principles that integrates human society with its natural environment for the benefit of both" (Bergen 1997). EE gathers a variety of different technologies and applications under its roof,

e.g. wastewater treatment, avoidance and minimization technologies, nutrient recycling (such as wastewater fed aquacultures), ecological building practices, landscape and river restoration and many more. The worldwide community of Ecological Engineers is mostly consistent of practitioners (who often run their own businesses) and academics. Concerning the disciplines, almost any academic field is present within this group of approximately 2000, ranging from civil and environmental engineering to social sciences and economics. Some 150 of them are organized within IEES (<http://www.iees.ch>, founded 1993).

Thus, the EE community is a rather small group and struggling with a number of problems:

- EE is still not very well known and struggling for wider acceptance
- EE practitioners are often somewhat isolated among their colleagues from traditional engineering and are under pressure to prove the efficiency of their systems
- Courses for further education for Ecological Engineers are almost non-existent
- The two main "cultures" of EE are also divided by the cultural gap between the Western world and the South and Eastern Asian tradition.

Addressing these issues is one of the main motivations of IEES for "myNetWorks.org".

2. PROJECT DEVELOPMENT

2.1. Users' needs

Three focus groups and an electronic survey in the EE community were carried out to identify users' needs for "myNetWorks.org". The results of the focus groups and the survey are:

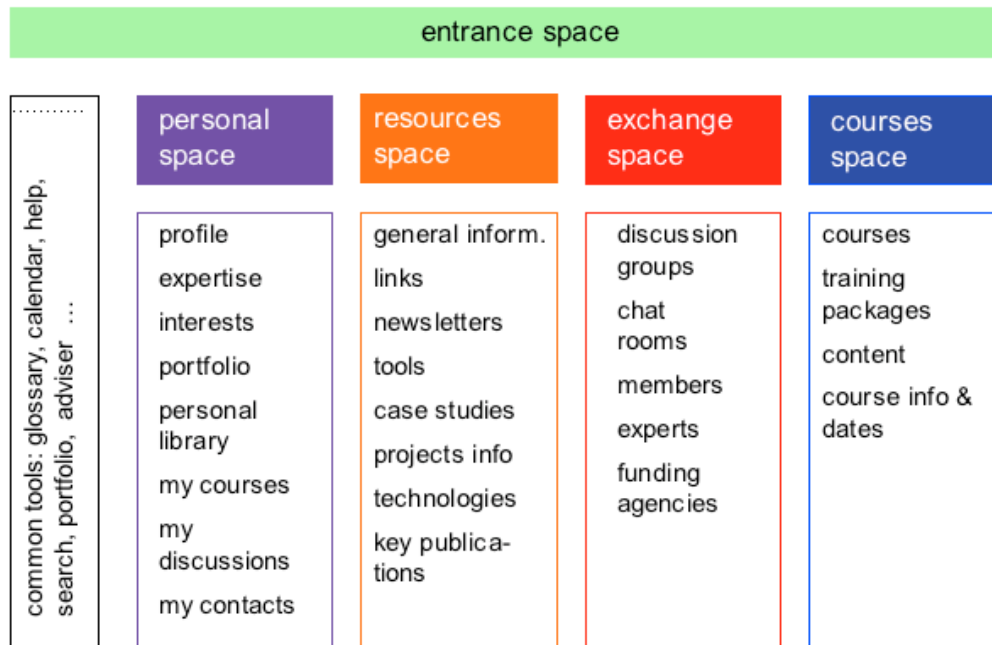
- The main target users of the environment were identified as practitioners, NGOs, university members, and decision makers.
- Actions which these target users would perform within the environment were identified and used in a process of activities analysis, generating a range of desired resources and functionalities.
- The highest interest was on a working environment for networking and exchange. The high rating of the options "accessing case studies" and "finding solutions for specific problems" indicate a need for practical, concrete information.
- The interest for online courses or even accredited online courses was rather biased. Senior professionals showed little interest in online courses, whereas others - probably younger people - showed high interest in them.
- The highest rated option in the electronic survey was "quickly accessing other people's experiences in dealing with similar problems". The respondents were also interested in quickly finding information which could help them to develop their projects.
- "Time to access the web environment" was the most important restriction among the respondents. Again, some people rated this restriction as "very important" - presumably senior professionals - whereas others did not.
- "Restricted access to the internet" was not a great problem among our respondents, but low bandwidth was, especially in developing countries
- Some of our respondents said they do not *always* have access to computers. Thus, asynchronous ways of communicating have to play a role in our concept

2.2. Basic concept

The basic concept is based on a reflective socio-constructivist approach and our team's professional experience (e.g. Pereira 2001, Schönborn et al. 2002). Our work is informed by the concept of reflective practice as developed by Donald Schön (1997) combined with the application of a socio-constructivist view of knowledge. We are also inspired by the

community spirit that can be felt within the EE community. The vision of an environment that allows to create a "personal" working space, enables a high degree of communication, and can be easily extended by its users has always been fundamental part of the work.

Fig. 1: Structure of the myNetWorks.org web environment



As a basic metaphor for information structuring we chose the analogy to real "spaces". We distinguish five main spaces (see Fig. 1):

- **Entrance space:** Provides an overview over the concept and content of NetWorks and information on how to use it. Users can log in or register as new members here
- **Personal Space:** In this strictly private space, the users collect and organize their own material, edit their profile, and reflect on their learning process.
- **Resources Space:** A collection of articles, photos, case studies, chat records, reports, links, downloadable software and more is accessible from here. Members of "NetWorks" can upload new resources and rate all others (open access concept). Thus, users will contribute to the generation and construction of knowledge.
- **Exchange Space:** Allows access to discussion forums and chat rooms. Members can create new discussion groups or reserve a chat room and invite people of his or her choice (open access concept). The member's profiles are available from here, with an indication of who is online at a given time and an instant messaging facility.
- **Courses Space:** Mainly an organizer for course related activities. Courses and workshops are located here and make use of tools and facilities provided in the other spaces, e.g. course related chat rooms, discussion groups and resources. Members can run courses by themselves after a short evaluation procedure (open access concept).

The use of **labels** helps to classify resources and functionalities. Documents are labelled as "reviewed" (by the editors) or "not reviewed". Chat or discussion groups have "free access" or "restricted access", they may be "moderated" or "not moderated". This aims to promote a quick visualization of the state or quality of a resource or function.

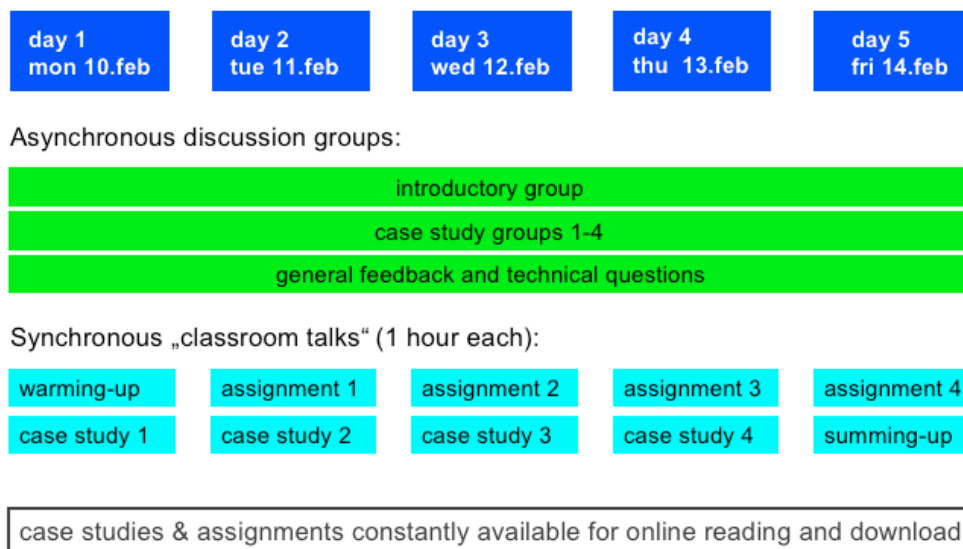
2.3. Course concept and test workshop

The course concept is based on the concept of "reflective practice" and on the socio-constructivist approach. The courses shall have a practical approach and will largely make use of real case studies. Learners are encouraged to use their own experiences to reflect upon the learning material presented.

A first 2-week test workshop on "Guidelines for effective ecologically engineered wastewater solutions" took place from Feb 10 to 21, 2003. It was based on four real-world case studies of ecologically engineered solutions for a wastewater situation. Information about these case studies was provided as downloadable PDF documents. The aim of week 1 (see Fig. 2) was to get acquainted with solutions applied to specific contexts. Two "classroom talks" (= chats) and a separate discussion group were devoted to each case study. There also was a "warming-up" talk on Monday, and a "summing-up" talk on Friday. Students were encouraged to do assignments (the formal analysis of each case study), and upload them to the courses space. The assignments were assessed by the experts and discussed in an assignment talk the following day. An instant messaging facility was available all the time to allow for spontaneous and informal exchange among the participants that were online.

Fig. 2: Plan for week 1 of the test workshop on "myNetWorks.org", Feb 10-21, 2003

NetWorks test workshop - Week 1



In week 2, the four case studies were evaluated and compared with respect to "design and planning", "maintenance and economics" and "messy problems and how to avoid them". Week 2 was structured similar to week 1 and made use of downloads, discussion groups and "classroom talks". It ended with two feedback groups and with filling out an evaluation form.

The test workshop used the web environment of "The Network University" (TNU), a self-development based on PHP and MySQL. Technical requirements on the client's side were: Windows 95 or Mac OS9 (or newer), the Internet Explorer 5 or Netscape 4.76 (or newer), Acrobat Reader 5. The URL of myNetWorks.org is: <http://www.mynetworks.org> .

2.4. Project timing

The project "myNetWorks.org" is divided into three phases. The initiation phase was started in May 2002 and ended after the test workshop. During the implementation phase (from now until 2005) we are planning to run 3 or 4 courses and workshops per year, which still have a pilot character, with continuous and user-driven networking activities going on all the time. We plan to fully open "myNetWorks.org" for course activities in 2005.

3. RESULTS OF THE TEST WORKSHOP

3.1. Characterization of participants

From 24 active participants (16), experts (4) and coaches (4) we received 18 filled out evaluation forms which are the basis for this section. Geographically the filled out forms covered all continents and time zones: New Zealand (1), India (3), Nigeria (1), European countries (8), the USA and Canada (4) and Costa Rica (1). There were 6 women and 12 men. Most of the respondents were engineers, researchers or lecturers/professors. 7 of the 18 named wastewater treatment as their area of work.

Most of the users had good or even very good experience in using the internet in general in a passive way (browsing, reading, downloading). Namely the senior experts had rather little experience which highlights the importance of preparatory courses for them. Hardly any participant had used communication tools over the web before. About 80% had never attended an online course or conference. A good induction course therefore seems to be an important point.

3.2. Rating of "myNetWorks.org" spaces and functionalities

Concerning the quality of the online spaces and the interactions, the great majority of the responses were very positive. Respondents thought that "myNetWorks.org" can generate an online community well (ca. 44%) or very well (50%). Even though a prototype level of the platform was used, most of the participants classified the interface design, forms of navigation and some other usability factors as *reasonably, well, or very well* contemplated.

The "chat records" and the "course schedule" were said to be among the most useful functionalities, together with the "list of documents". "Student's assignments", "discussion groups" and "members list", were also classified in a high position. Just a bit below came the "library", the "list of experts" and the "chats". The "calendar" and a "time zone converter" were not considered of high relevance by the majority. "FAQ", and "help" function seem to have been less used and considered less useful functionalities.

3.3 Chats and discussion groups

Half of the respondents took part in less than 50% of the chats. It seems that the amount of time dedication the chats demanded (2 hours per day) was a lot, considering that most of them were working during the two weeks of the workshop. The most cited reasons for non-active participation in the chats were time and lack of experience. The intense nature of the chat conversation seemed to be inhibitory to those with less experience.

During the workshop we observed a reluctant use of the discussion groups (DG). There seem to be mostly two complementary reasons: lack of time and competition with the chat sessions. The chat sessions were livelier and had a more immediate appeal. Thus, they attracted participants and the most interesting discussion took place in chats. However, as the chats were time consuming, participants were left with no time to invest in the asynchronous

discussions in the DGs. As a result, those who could not participate in the chats due to time difficulties were somehow deprived from the best discussions and probably felt more like having a passive participation, reading posts and the recorded chats. A better balance of both functionalities (chats and DGs) should be sought, as various participants recognize the importance of both.

Chat stability, together with PDF visualization and browser compatibility seem to be among the main technical issues to be improved. In general, however, the environment performed remarkably well.

3.4 Positive and negative aspects

The overall feedback on positive aspects is encouraging, as it confirms the usefulness of the approach chosen in the design of the learning environment and of the workshop. The functionalities were praised, as well as the interface design, the community feeling, and the organisation. Time was cited as the reason for most difficulties. To deal with this, we may have to reduce the use of chat rooms and combined them with the larger use of asynchronous activities in the discussion groups. This would allow participants who have less flexible working hours to better manage their participation. The fragmentation of the learning environment into different spaces was negative to only one participant, while it was positive to others. The reason for this problem may be the very little experience this respondent had with internet-related technologies.

3.5 Suggestions for improvement

The organisation of chats and discussion groups, in a way that they complement each other and alleviate the time-related problems seems to be the most important suggestion, regarding the course organisation. A reorganisation of assignments was also asked for. Other important points were the definition of course results and the need for an induction course (to allow participants to get used to the environment, tools and resources) and for more preparation material.

4. CONCLUSION

In general, the participants' feedback was very positive and they seem to have had a very constructive experience. The encouraging words together with a willingness to continue using myNetWorks is promising.

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