Experiences in Using Internet Based Learning Environment in Paper Industry

Timo RAINIO[1], Sami Rautiainen[2], Juha Parikka[3], Reijo TUOKKO[4],

[1]Tampere Technology Centre Hermiankatu 6-8, 33720 Tampere, Finland,[2]Metsä-Serla Metsä Institute Silva P.O. Box 582, FIN-33101 Tampere, Finland,[3]Metsä-Serla Metsä Institute Silva P.O. Box 582, FIN-33101 Tampere, Finland,[4]Tampere University of Technology, Institute of Production Engineering P.O.Box 589, 33101 Tampere, Finland

Abstract: Tampere Automation Center TAC (http://www.tacnet.sci.fi) is a unic cooperative network in the field of mechanical engineering and automation technology.

Metsä -Serla is a Finnish paper manufacturer and has about 16 000 employees around Europe. In some paper, board and pulp mills in Finland the statistical average age of employees in Metsä -Serla is 45 - 50 years. By the year 2003 Metsä -Serla will need at least 350 or probably 500-600 new skilled employees. Metsä Institute Silva was founded to foresee and to educate these needed employees. The vocational education is founded on two elements; *theoretical training* periods and *on job training* periods. Theoretical training periods take two to eight weeks. Right after theoretical training period, students have an on job training period, which takes two to four months.

During the on job training periods students are in paper, board and pulp mills around Finland. Internet based learning environment was developed to support this on job training. Students have to write a learning diary and do on job training activities during job training periods. The Internet based learning environment is a solution to use online learning diary and to use and create online learning material. Senior coordinators and mentors at workplace guide and support students by this environment. Users can use the whole environment and it's functions any time and from any location. The developed Internet based learning environment of Metsä Institute Silva is based on the TopClass software.

The paper discusses comprehensively the structure and contents of the developed Internet based learning environment as well as the practical experiences in using it in training and education of employees for paper industry.

Keywords: *Network, Automation, Industry, Distance education, On job training*

1. Tampere Automation Center (TAC)

Tampere Automation Center TAC (http://www.tacnet.sci.fi) is a unic cooperative network in the field of mechanical engineering and automation technology (Fig. 2.). The main task the center is to make the work of the participating organisations more effective and productive by improving cooperation and the flow of information. TAC cooperation is coordinated by Tampere Technology Centre and the other educational member organizations are: Tampere University of Technology, Tampere Polytechnic University, Vocational School of Pirkanmaa, Vocational School of Tampere (Units of Hervanta and Pyynikki) and Vocational Adult Education Centre of Tampere. Other included partners are the Technical Research Center of Finland (VTT) and a big number of industrial companies. Quite new methods and cooperation models have been developed and applied in cooperation between these educational institutions and industrial companies so that this TAC-cooperation has achieved a status of a respected pioneer in the field in Finland.

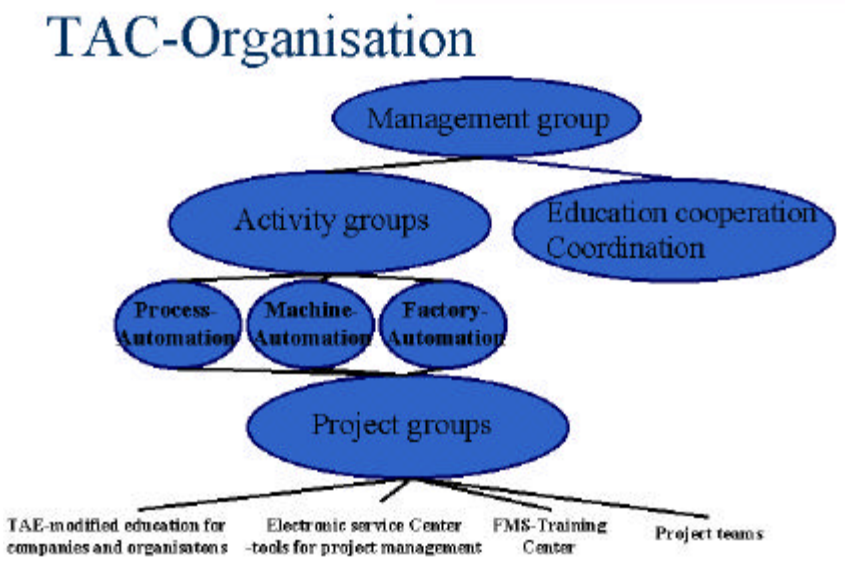

Fig. 1. Organisational structure of Tampere Automation Center

2. TAC co-operation in education

Within TAC there has already been over 5 years of development in education co-operation in automation branch at Tampere region. Following objectives were set for the first phase of OPM-funded (Ministry of Education) TAC co-operation project in education in academic year 1995-96:

- a review about the current status of education in different educational institutions of TAC
- a review about the points of focus of education and planning and arranging of teaching
- extending co-operation in teaching and seeking new activities for co-operation
- informing about activities
- evaluating and designing new ways of co-operation

The purpose of the objectives stated above was to strengthen current co-operation and seek new possibilities and thus create a common, solid automation education entity that utilizes resources as effective as possible.

In the first phase of the TAC education project the aim above all was to review the current status and create the basis for co-operation subsequently and also seek those methods and guidelines, that will be the basis for education in the future.

TAC-education is based on distributed joint educational environments (http://www.tacnet.sci.fi/Opetus). TAC has a project with Metsä Institute Silva – an education unit of the Metsä -Serla corporate, the purpose of which is to use sophisticated learning environments and modern Internet technologies in teaching of its students. In this project comprehensive experiments have been made with a number of teaching environments for evaluating their capabilities for distant learning. Goal of this research has been to find out

- needed technology
- methods and routines to get needed teaching material created and to prepare it into suitable form for distant learning
- teaching arrangements and practical functionality
- pedagogical benefits achieved

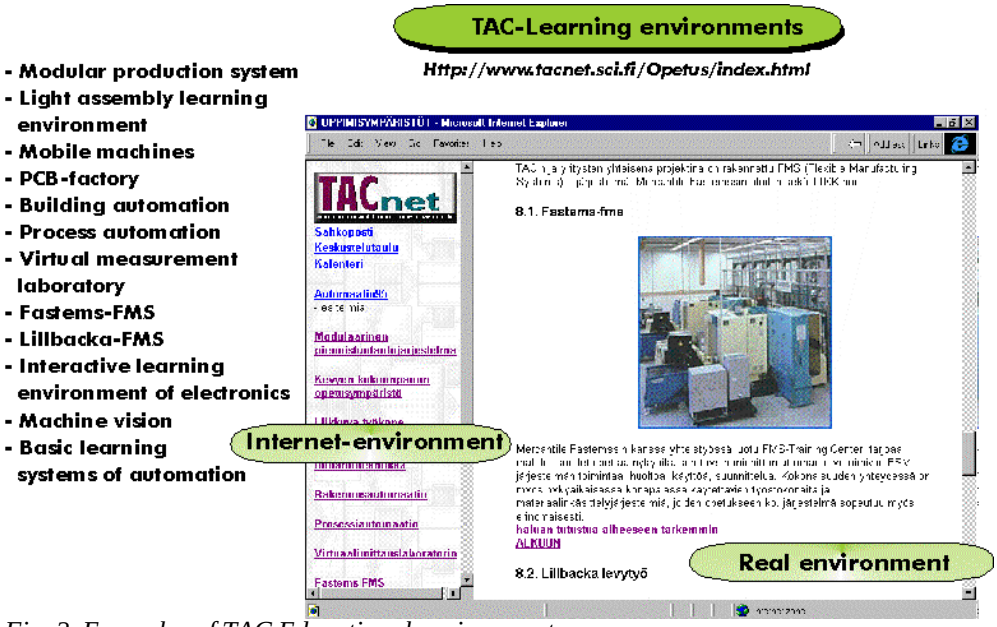

Fig. 2. Examples of TAC Educational environments

3. Education concept of Metsä Instituutti Silva

Metsä -Serla is a Finnish paper manufacturer and has about 16 000 employees around Europe. In some paper, board and pulp mills in Finland the statistical average age of employees in Metsä -Serla is 45 - 50 years. In the foreseeable future lots of employees will retire. Secondly new technology makes new demands on know-how of employees. By the year 2003 Metsä -Serla will need at least 350 or probably 500-600 new skilled employees. Metsä Institute Silva was founded to foresee and to educate these needed employees. Education in common vocational schools is not enough for employees of Metsä -Serla. Education in Metsä Institute Silva is tightly connected to real working and strategical aims of company. The vocational education is founded on two elements; theoretical training periods and on job training periods.

Theoretical training periods take two to eight weeks. During these periods knowledge and skills are studied and examined through normal theoretical training and demo sessions in adequate technical environment. Metsä Institute Silva is located in City of Tampere and the most of theoretical education is given there. Right after theoretical training period, students have an on job training period, which takes two to four months. Activities during on job learning periods are tightly connected to real vocational work, studies and good guidance at own mill unit. During the on job training periods students are in paper, board and pulp mills around Finland. Internet based learning environment was developed to support this on job training. This environment improves communicating between senior coordinators, mentors at workplace and students during on job learning period.

Senior coordinators work in Metsä Institute Silva. They organize appropriate and good quality education and support student during theoretical periods. They make sure that education is based on student's curriculum and training model of Metsä Institute Silva. Mentors at workplace are employees of mills and they guide and support students during on job learning periods. Mentors at workplace make sure that during on job learning periods studies are based methods of own mill and on accurate technical data. Students have to write a learning diary and do on job training activities during job training periods. Senior coordinators in Metsä Institute Silva and mentors at workplace review on job training activities and read learning diaries.

The Internet based learning environment is a solution to use online learning diary, to use and create online learning material including other on job training activities. Senior coordinators and mentors at workplace guide and support students by this environment. Users can use the whole environment and it's functions any time and from any location. The developed Internet based learning environment of Metsä Institute Silva is based on the TopClass software.

4. Experiences about the education systems

In this case there are only 29 students and two senior coordinators. The number of mentors at workplace is 40.

TopClass has good features when it is used by a big number of users. TopClass has several functions that help instructors and administrators. For example multiple-choice tests and automatic test reviewing are very useful when the number of student is big. Although TopClass has varied functions, the most of them are not used in learning environment of Metsä Institute Silva. Instead of using automatic functions Metsä Institute Silva concentrates giving very individual guidance for students. Mentors at workplace and senior coordinators guide students very carefully by learning diary and on job training periods. Automatic functions are not needed.

In learning diary student considers subjects that he has learned. When student writes regularly into learning diary, he goes though learned subjects and learning process is more effective. Senior coordinators have access to read and write into every student's learning diary. Then it is easy to get information about development. Mentors at workplace have access to read and write only into their own student' slearning diaries. Students have access only to their own learning diaries. Time-consuming on job learning activities are set by senior coordinators and reviewed by senior coordinators and mentors at workplace. On job learning activities are connected to previous theoretical training period and to mill's own products and technology. Students have to answer on job learning activities with their own words. That's why it is not sensible to use multiple-choice tests as on job training activities. Typically student writes his answer with word processing program because then it is easy to do profound answer and add pictures into it. Student saves the answer into file and sends the file as attachment to senior coordinator. Senior coordinator checks that answer has all the required elements and if necessary, student has to improve the answer. After senior coordinator has accepted the answer, student adds it into his learning diary. Mentor at workplace has an access to students learning diary and he can review the answer. Mentor at workplace concentrates to check technical details in the answer.

5. Conclusions

The main idea was that the Internet based learning environment must be easy to use, especially for mentors at workplace. Because some of mentors at workplace have poor skills to use computer, functions that they have to use are quite simple. Only reading messages, sending messages and downloading files in learning diary are necessary functions for mentors at workplace.

All users have been educated to be able to utilize effectively needed functions in learning environment. Every user got a one-day education. Students and senior coordinators are familiar with Windows applications and Internet. There have been no problems with them. Students got their education during theoretical training period. As we expected, everything went very well. Mentors at workplace got their education at the mills. Concurrently we educated mentors at workplace, we got a good conception about working conditions and habits in mills. Some of mentors at workplace have very conservative attitude to computers. Despite that it seemed that everyone learned needed actions.

At this time TopClass is working quite well as learning environment of Metsä Institute Silva. TopClass could be easier and comfortable to use if the big number of unused functions could be decreased. The biggest challenge is to get mentors at workplace to use environment regularly. Internet based education is new thing is paper industry and it is important to be forbearing during implementation. Continuous support for users is necessary.

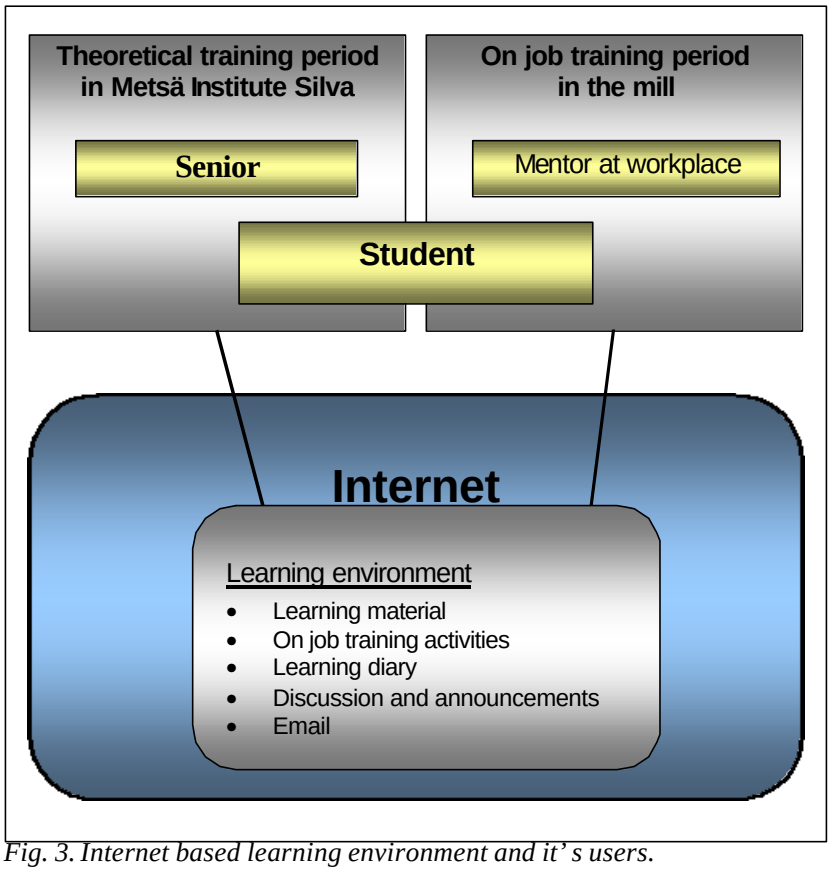

Fig. 3. Internet based learning environment and it's users.

Contact information:

Msc Timo Rainio
Tampere Technology Centre
Hermiankatu 6-8, 33720 Tampere, Finland
Tel. +358 3 3165050, mobile +358 500 736605
Fax: +358 3 3165552, email: timo.rainio@hermia.fi

Sami Rautiainen
Metsä Institute Silva
P.O. Box 582, FIN-33101 Tampere, Finland
Tel. +358 1046 32444, mobile +358 40 7248253
Fax: +358 1046 32536, email: sami.rautiainen@cc.tut.fi

Prof. Reijo Tuokko
Tampere University of Technology
P.O.Box 589, 33101 Tampere, Finland
Tel. +358 3 3652313, mobile +358 50 561 1192
Fax: +358 3 3652753, email: reijo.tuokko@tut.fi