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DEVELOPMENT OF VIRTUAL LEARNING MATERIAL

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The purpose of this thesis was to deal things which are related to virtual learning. The most essential things which were examined relating to virtual learning and doing of a web course were: learning by a computer, development of virtual learning material, web exercises, teacher's role, communality, evaluation and giving feedback to a student. In the theoretical part of the thesis was told also about the concepts: eLearning, web-based learning, blended learning and Computer Based Training. In the thesis was reviewed also the future of virtual learning.

The functional part of the thesis was to create a web course, called Environmental Economics, for the Faculty of Technology and Maritime Management Pori of Satakunta University of Applied Sciences. The course was a part of Total Quality Management and Business Processes degree programme. The course was executed on the web at the first time in spring 2009. In the Environmental Economics course was dealt the issue of how human exploits the environment financially.

When was made the written part of the thesis, were used literature of the field and Internet. When the Environmental Economics course was made, were used literature, Internet and articles of news papers. Also the years-long conversance to the subject helped in the development phase of the course and in executing of its virtual learning material.

In this thesis was brought out what were included to the development of virtual learning material. The phases were presented in the first part of the thesis. At the end of the thesis was told about the Environmental Economics course. At the end of the thesis was presented the Environmental Economics course in pictures as well. By a thesis was born a work which can be used later as an instrumental in developing virtual learning material. The Environmental Economics course was completed in time for studying, and it will be studied in the future too.

VIRTUAALISEN OPPIMISMATERIAALIN LUOMINEN

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Tämän opinnäytetyön tarkoituksena oli käsitellä virtuaalisen oppimateriaalin luomiseen liittyviä asioita. Keskeisimpiä asioita, joita tutkittiin virtuaaliseen oppimiseen sekä verkkokurssin tekemiseen liittyen, olivat: oppiminen tietokoneen avustuksella, virtuaalisen oppimateriaalin luominen, verkkotehtävät, opettajan rooli, yhteisöllisyys sekä arviointi ja palautteenanto opiskelijalle. Opinnäytetyön teoreettisessa osuudessa kerrottiin myös käsitteistä: e-oppiminen, verkko-oppiminen, monimuoto-opiskelu ja tietokoneavusteinen oppiminen. Opinnäytetyössä tarkasteltiin myös virtuaalisen oppimisen tulevaisuutta.

Opinnäytetyön toiminnallisena osana oli luoda verkkokurssi, nimeltään Environmental Economics, Satakunnan ammattikorkeakoulun Tekniikka Porin yksikölle. Kurssi oli osa Total Quality Management and Business Processes –suuntautumisvaihtoehtoa. Kurssi toteutettiin verkossa ensimmäisen kerran keväällä 2009. Environmental Economics –kurssissa käsiteltiin sitä, miten ihminen käyttää ympäristöä taloudellisesti hyväksi.

Opinnäytetyön kirjallista osuutta tehtäessä apuna käytettiin alan kirjallisuutta sekä Internetiä. Environmental Economics -kurssia tehtäessä hyödynnettiin kirjallisuutta, Internetiä ja sanomalehtiartikkeleja. Myös aiheeseen perehtyminen vuosien saatossa auttoi kurssin suunnitteluvaiheessa sekä sen virtuaalisen oppimateriaalin toteuttamisessa.

Tässä opinnäytetyössä tuotiin esille, mitä sisältyi virtuaalisen oppimateriaalin luomiseen. Vaiheet esiteltiin opinnäytetyön alkuosassa. Opinnäytetyön lopussa kerrottiin Environmental Economics –kurssista. Opinnäytetyön lopussa esiteltiin Environmental Economics –kurssi myös kuvina. Opinnäytetyönä syntyi teos, jota voidaan käyttää myöhemmin apuna virtuaalista oppimateriaalia suunniteltaessa. Environmental Economics –kurssi valmistui aikataulussa opiskelua varten, ja kurssia tullaan opiskelemaan myös tulevaisuudessa.

CONTENTS

LIST OF CONCEPTS

Application program	Application software is any tool that functions and is operated by means of a computer, with the purpose of supporting or improving the software user's work.
CD	Compact Disc
CMS	Content Management System
Discussion Forum	An Internet forum, or message board, is an online discussion site. It is the modern equivalent of a traditional bulletin board, and a technological evolution of the dialup bulletin board system.
E-Learning	eLearning, electronic learning, learning with the help of digital communication technology
E-mail	Electronic mail
External Link	An internal link is a hyperlink that is a reference or navigation element in a document to another section of the same document or to another document that may be on or part of the same website or domain of the internet. Links are considered either "external" or "internal" depending on perspective. Generally, a link to a page outside the same domain is considered external, whereas one in the same domain is considered internal.
Hyperlink	In computing, a hyperlink, usually shortened to link, is a directly followable reference within a hypertext document.

	Hypertext is text, displayed on a computer, with references (hyperlinks) to other text that the reader can immediately follow, usually by a mouse click or key press sequence.
IBL	Internet Based Learning
LMS	Learning Management System
Multimedia	Multimedia is media and content that utilizes a combination of different content forms. The term can be used as a noun (a medium with multiple content forms) or as an adjective describing a medium as having multiple content forms. Multimedia includes a combination of text, audio, still images, animation, video, and interactivity content forms.
Network	A network, in the context of electronics, is a collection of interconnected components.
News Group	A usenet newsgroup is a repository usually within the Usenet system, for messages posted from many users in different locations. Newsgroups are technically distinct from, but functionally similar to, discussion forums on the World Wide Web.
Simulation	Simulation is the imitation of some real thing, state of affairs, or process. The act of simulating something generally entails representing certain key characteristics or behaviours of a selected physical or abstract system.
Software	Computer software or just software is a general term used to describe a collection of computer

	programs, procedures and documentation that perform some task on a computer system.
Virtual Learning	Learning in virtual learning environment
VLE	Virtual Learning Environment
www	World Wide Web, web
WBL	Web-based Learning
WBT	Web-based training, WBT is the term that is used most often to describe the use of Web technologies for learning within industry, while the terms Web-based education and Web-based instruction are more common within universities.

1 INTRODUCTION

The creation of this thesis began when the Faculty of Technology and Maritime Management Pori of Satakunta University of Applied Sciences needed a course, the Environmental Economics for offering it to the students. The course Environmental Economics is a part of Total Quality Management and Business Processes degree programme. Finnish students and exchange students in Satakunta University of Applied Sciences can study that course on the web.

This thesis tells how a virtual learning material can be developed. In the end of this thesis is shown what Environmental Economics course looks like. Before it a reader can find information for instance of virtual learning, web-based learning, what kind of exercises can be executed on the web, and aspects of virtual learning in the future. The term virtual learning is mostly used in this thesis when is written about the learning on web courses.

By means of this thesis a reader gets knowledge what things should be taking into consideration when a virtual course is generated. Reader can get hints for a planning process of virtual course. This thesis is created by a student of the University of Applied Sciences from the unit of business administration so all pedagogical aspects can not be included in this research.

The goal of this thesis is to delineate what things are included in the development of virtual learning material and what kind of course the Environmental Economics is. After reading this thesis a reader has a clear view what a virtual course is about and what it could look like. The aspects of learning are brought out from student’s and teacher’s points of view.

Virtual based things of learning and virtual things in general as well are changing all the time. New technology is invented every day. The environment and a concern of its well-being are the main subjects of the course Environmental Economics.

2 LEARNING WITH COMPUTER

There are many different concepts of learning using the Internet and a computer. Usually the learning environment is not situated at the classroom but instead at the virtual learning environment. Different virtual learning and teaching styles are often mixed together. The development of this kind of training can make possible many new inventions of teaching and learning. Those are i.e. using videos, television and mobile phones in teaching. There's no need to study always at the same place. Of course there can also come up some problems with virtual learning if for example communications do not work.

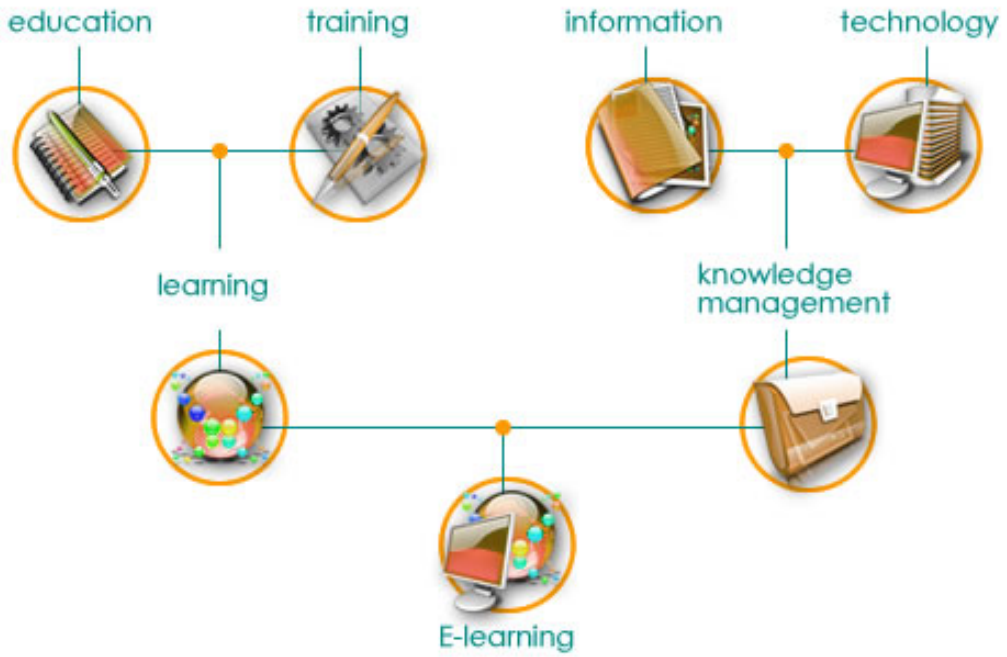
In the middle of the 90s, after the development of www-pages, the present-day virtual learning environments started to become general (Keränen & Penttinen 2007, 28). After that as well as all technology, has the virtual learning developed and got better a lot. Nowadays video negotiations can be arranged between people from different places during the meetings and this same happens also during different learning occasions.

People can be in touch with friends from other side of the world via different computer programs (i.e. Skype) in real time. For exploiting all possibilities, people of course have to know how to use all mechanical items and training conventions. For that, giving the right information and teaching is the key to make things work.

Picture 1. People can be in touch with each others from other side of the world in real time.

2.1 eLearning

eLearning has risen for the most common term used in speaking about learning which happens by digital communication technology. The nearest concepts of eLearning are distance learning, Computer Based Training, teaching technology or training technology. (Alamäki & Luukkonen 2002, 12-13.) eLearning can also be written as e-Learning.



Picture 2. eLearning

eLearning as a term is well known but contents and bounds of it vary by a definer. Somebody includes everything of all learning what happens by electronic tools to it, such as learning with CD-ROMs and video negotiation equipments. Others delimit it to the web-based teaching and learning. With the term web-based learning (WBL) is also used the term Internet based learning (IBL), which is used when is wanted to emphasize the meaning of the web as a teaching aid. (Alamäki &c. 2002, 13.)

2.2 Web-based Learning

By web-based learning is meant learning circumstances where is made good use of information and communication technology. WBL has become general after the development of the Internet. Speeded up net connections and the development of net work programming have made possible virtual learning environments and the distribution of digital learning materials via the Internet. (Keränen &c. 2007, 1.)

Web-based learning can also be called as eLearning. Mostly the word web-based learning is connected to courses on the web. By WBL can also be meant the learning occasion in a classroom, when a teacher is teaching with materials which can be situated in Learning Management System. The materials can be www-pages as well. To a certain learning occasion can also join other student groups i.e. via video negotiation. (Keränen &c. 2007, 2.)

The simplest web-based learning mode can be searching information from the web or returning an exercise and having feedback via e-mail. To WBL belong web courses, learning material on the web, learning occasions followed through via connection of video negotiation, and seminars on the web. (Keränen &c. 2007, 2.)

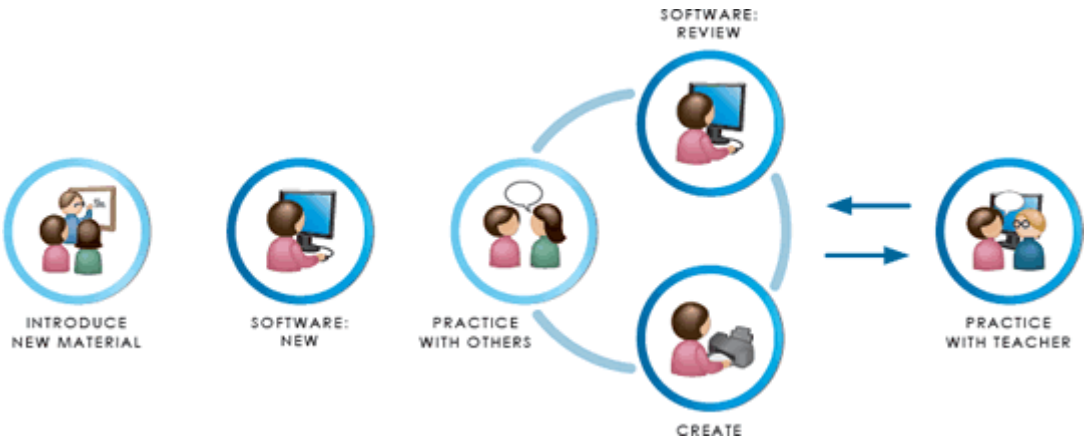
To web-based learning belong also different computer programs like multimedia programs, games and simulations. They are used as a help of teaching to observe new things to learn. Application programs maybe don’t use the networks but they could be installed in user’s computer or they work i.e. from the CD. (Keränen &c. 2007, 2.)

2.3 Virtual Learning

Virtual learning means learning occasion which happens in virtual environment. Databases don't have to put to use the network. They can be installed into user's computer or they can work for example from the CD. Virtual learning is learning in a Virtual Learning Environment (VLE). (Keränen &c. 2007, 2.)

2.4 Blended Learning

Blended learning means training in which are used different educational methods. Teaching is often a combination of classroom teaching and distance teaching. Distance teaching can be guided teaching, self-directed studying or learning by working. (Keränen &c. 2007, 22.)



Picture 3. Blended Learning

Blended learning is popular in personnel training. At the companies it makes studying easier along with the work. (Keränen &c. 2007, 22.) If learners are situated in different localities, learning occasions can be arranged via video negotiations (Kalliala 2002, 23).

2.5 Computer Based Training

To Computer Based Training belong syllabuses and learning materials which are meant to self-directed studying. Computer Based Training and virtual learning thus often are self-directed studying. That kind of studying go on without the guidance of teacher, whereas to the web-based learning is usually related interaction between a teacher and students. (Keränen &c. 2007, 2.)

The computer works as a teacher and it guides student's progress meanwhile she or he is studying a subject. Different tests which measure student's know how are used in the Computer Based Training. Tests are usually realized as multiple choice questions or other form-shaped questions which are revised by a computer. The computer also gives feedback. (Keränen &c. 2007, 2.)

3 CONSTRUCTION OF VIRTUAL LEARNING

Studying on a web course is a nice change compared to a traditional studying in a classroom. Exercises can be made by the own rate and in many occasions in a group. But a student has to check his or her calendar also because there are the returning dates of the exercises. Studying on a web course needs more initiative behavior than sitting in a classroom listening to teacher. Mostly, studying on a web course is harder than traditional studying.

The ability to judge the media in a critical way, especially on the Internet, is a very important ability of a student. It means that a user of the networks learns how to separate important information of less important. A student learns how to find pearls from the information mass. She or he learns also how to create own opinions of things even if information sources were inconsistent with others, old or even flawed. (Kalliala 2002, 41.)

For a teacher the main point is to make a material of a web course in the way that students learn. The learning can happen by following the material. Or a material

gives tips and encourages a student to search more information and helps he or she to create new thinking. Nowadays in virtual teaching can be used many technical equipments, information channels and i.e. web pages and videos.

The interplay between a teacher and students is still very important. There can also be many combinations of web courses. In some web course there can be used only web-based learning but the using of blended learning method is very popular. That's because it works. For example, first there is a meeting in a classroom where teacher tells momentous things related to the web course to the students. After that, students do the exercises on time and in that way the whole course (Picture 3.). Many necessary things are related to a web course.

3.1 Virtual Learning Environment

Learning Management System like "learning board on the web" has a very important role in the web-based learning because it gives tools for making the web course. There are also other names for Learning Management System like: Web-based Learning Environment, Virtual Learning Environment or Course Management System. (Keränen &c. 2007, 28.)

For example Moodle and R5 Portal are Learning Management Systems. The using of those systems usually requires registration. For entering to the course and to the whole Learning Management System, the user needs a password and a user name.

"A VLE can be viewed as a useful collection of e-learning tools in a package that allows a common interface and sharing of data between the tools. While the specifics of any one VLE will vary, on the whole they offer similar functionality. We can think of a VLE as having three dimensions to its functionality, each of which represents a different interface and audience." The three dimensions are institutional, academic and learner. (Weller 2007, 16.)

Virtual Learning Environments must be easy to use for both; for the teacher (the person who usually does the course) and for the student. VLEs also must be practical. They have to give a surplus value for teaching and learning.

"The main learning and teaching functions can be summarized as:

- Content delivery – easy upload and management of content in a variety of formats.
- Asynchronous discussion – text based discussion boards that can be easily created and are straightforward to use, with threading of messages and attachment capability.
- Online assessment – a range of assessment tools including multiple choice, matching pairs and short text answers.
- Student tracking – the ability to record a student's progress through a course and have this information presented in a concise format.
- Synchronous discussion – text based discussion in real time, perhaps combined with other real time tools such as a shared whiteboard or web casting.
- Student tools – these usually include a calendar, a personal area for uploading resources, a note-taking tool, and email." (Weller 2007, 18.)

3.2 Making the Material

Learning materials for different courses vary from what a teacher wants to put on the web. Somebody can put a same text used in a traditional teaching on the web, i.e. transparencies. But of course the material is much better if it is reshaped to a virtual learning environment. If there are participants from different countries, courses made in English suit normally people who don't speak the same language in the first place.

At the developing phase of the material, a maker has to know why the material in question is necessary for a student, and how a learner learns and achieves the know how which is in target (Koli & Silander 2002, 34; Matikainen &c. 2003, 79). In a virtual teaching together with a text can also be used many other tools for teaching. These kinds of tools are such as free videos, web pages and TV programs.

The material has to be clear and easy to outline. Analysis of the material is very important. With in a right way outlined material, a headlining, a text, pictures, diagrams etc. can also inspire a student to change the learning in order and in that way to find

something new that she or he could not figured out by following the already planned path. But a maker of the material can catch learner's attention with exactly those elements also.

People certainly took fancy to different colors, shapes, pictures, fonts and so on but functional entireness of a web course is probably the idealist situation. Every web course should include a possibility for students and teacher to use e-mail. There have to be a possibility to use other interaction elements too i.e. news groups.

Putting material to a VLE with Learning Management System is quite easy. There are directions how to put a text, pictures, hyperlinks, external links etc. into a course. Of course the right use of Learning Management System needs practicing and time. In every organization (at least in universities of applied sciences) is a person who is responsible of computer issues. As well as teachers, students need also guidance in using of information technology.

3.3 Copyright

Laws and plans of actions of a copyright vary in different countries. In Finland a copyright protects every text, book, work of art etc. which are original enough to outrun the limits of a copyright. To a learning material on the web has to be marked a name or names of a maker or makers of the material. The permission to use the material should be asked every time when somebody's material i.e. a text, a cartoon etc. is used in a virtual learning environment. (Kalliala 2002, 99-104.)

3.4 Learning Method

By a learning method a learner is got to learn meaningfully and pedagogically new things. A learner learns by doing exercises. In that way he or she achieves new relevant pieces of information. The meaning of a learning method is to support learner's learning by absorbing always something new. By learning method is learning guided methodically, for example learner's observation, processing of information, working and reflecting. (Silander & Koli 2003, 45.)

By learning methods, can among other things, the development of meta cognitive and problem-solving skills be promoted. The learning method can practice already existing skills and knowledge. That occurs when the aim is to develop those skills or when to already learned skills and achievement is attached new elements. (Silander &c. 2003, 45.)

Learning methods are similar in web-based learning and in traditional learning. They are teacher's interacting and guiding tools during a web course. A learning situation can be created by a learning method. A workable learning method has an internal pedagogical structure and it becomes a part of a learning process. (Silander &c. 2003, 45.)

3.5 Learning Process

From a Learning Management System a learner finds directions for using the VLE. She or he also finds from there contact information, materials, exercises, returning places of exercises and so on. In the beginning of the studies a student builds a picture in his or her mind of the training and so does a student in a virtual learning environment also. There have to be a description of a web course the one in question in a VLE, and what a student is expected for as well. (Matikainen &c. 2003, 71-73.)

What becomes to a material of a virtual course it is more producing to give tips to a student to follow and search different sources of information than give everything in a text. The learning of a student diversifies on the web. The web gives freedom to get acquainted things optionally. External links can create such background information or know-how which the learner could not imagined needing earlier. (Matikainen &c. 2003, 77-79.)

By the learning process is very important to respect, to awake, and to maintain a student's inner motivation. With the guiding material, things should be questioned and putted into disagreement – even provoked. The disagreement of knowledge and calling into question activate a student to provide more and stricter information and to process it. (Matikainen &c. 2003, 77-79.)

The continuous giving of feedback is typical and necessary in virtual learning. In that way a student develops his or her know how and the learning goes on. An extensive guidance keeps inside the designing of a virtual learning process, evaluation, feedback, and the whole process. In the learning process, different elements – learning occasions, exercises, teaching, guidance, feedback and evaluation - comprise the whole package. (Koli &c. 2002, 31.)

The structured learning process – a learning situation, an exercise and a guidance of it – makes the guidance clear and reasonable entireness and easy to follow. The know how is achieved by the learning occasions. Every field is visible to learners. (Koli &c. 2002, 34-35.)

A teacher describes in the virtual learning environment the learning process from the beginning of the course until the end. There are showed the objectives, the learning methods, the evaluation - and a discussion of it. Teacher's and students' actions are showed to everybody. Learners know what they are expected for and they know teacher's ambitions and ways of action. The learning process becomes compact but there have to be a space for changes too. (Koli &c. 2002, 34-35.)

3.6 Teacher's Role

Koli and Silander (2002, 28) say that when a virtual learning environment is used, there has to be taken into consideration that the role of a teacher is not to work as a giver of an information, but more like as an expert of own territory and as an adviser of the learning process. Teacher works on the networks as well as a teacher, a researcher and as an adviser. He or she answers the questions, is an administrator and a feedback giver (Kalliala 2002, 23). Teacher on the web should know how many possibilities the web gives for teaching. He or she should know how to take an advantage of those possibilities in suitable ways (Kalliala 2002, 127).

Teaching in a virtual environment needs for a teacher good interaction skills, especially in written form. A positive communication and a constructive criticism expressed in a positive way are always good ways of bringing out the important cases.

It’s also good to remember that smiley faces :), ;) etc. are allowed to use in VLE, within the limits of good taste of course.

A student is motivated by the presence of teacher (in virtual learning environment by i.e. short greetings). By a communication a teacher shows that he or she follows the progress of a student (Jasu-Kuusisto & Mattila 2007, 34). Material and a net work guidance should anticipate to learners’ possible questions. It should also replace teacher’s exhilarating performance with examples and jokes. At least from a text on the web are missing tones and emphasis of a voice, breaks, expressions, motions and movements. (Kalliala 2002, 126.)

If a student has a specific returning date of an exercise, a teacher has to as well give an evaluation grades and feedback on time. Teacher has to make a schedule for him or herself. A pertinent feedback for a teacher is also important. The critical evaluation of own teaching after ending a study module, is an excellent tool in developing individual teaching (Jasu-Kuusisto &c. 2007, 31). There are always chances to make a virtual course better than before, a teaching more fluent and the interaction between teacher and students more workable.

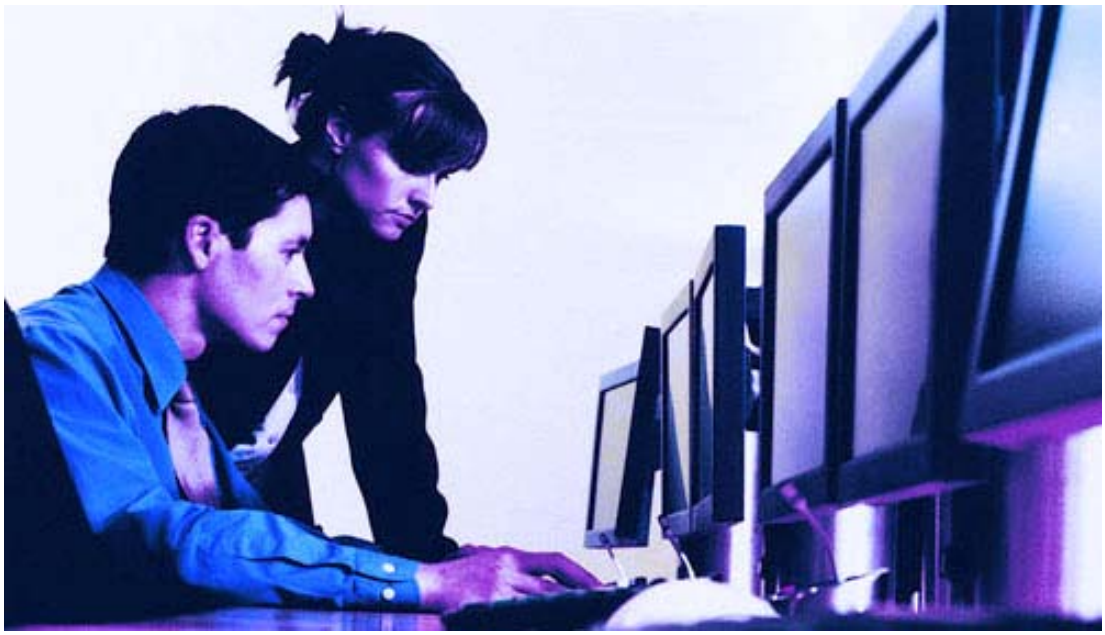
3.7 Communality

The interaction is sending messages, receiving of messages and reacting to them. There have to be a sender or senders of a message, a receiver or receivers and a communicational channel. The form of a message needs to be understandable. The interaction should be dialogic not monologic. It should contain different viewpoints with explanations and critical questions, not only conforming to others’ thoughts. Interaction in VLEs isn’t still the same thing as it is in traditional teaching in a classroom. (Kalliala 2002, 78-87.)

Virtual learning environments often support communal development of knowledge and give tools for it. The goal is to share information. Students can produce new thoughts after already invented information. In many VLEs students’ questions, comments, creations etc. are shown for everybody. In a virtual learning, a know how

consists of information acquisition and problem solving process in the interactive system. (Koli &c. 2002, 28-29.)

The interaction is generated mostly with discussion forums into which a teacher can participate with her or his own personal communication style. Teacher can ask students for discussion in discussion forums. The interplay between students and teacher can be improved during the real time chat discussions. But someone is maybe not as capable or willing to chat than somebody else. (Jasu-Kuusisto &c. 2007, 34.)



Picture 4. Discussion on Forum

Usually, in every Learning Management System are chat rooms and discussion forums along with e-mail. Group works are common in virtual courses as well and a functional interaction is very important in doing exercises. If the net work connections are not working, sometimes for example using a mobile phone can solve the problem or a fax machine, if some exercise should be returned (Kalliala 2002, 86).

Teacher's optimism in creating the communal intercourse is important. It works also as an example for students. In showing and interpretation optimism, teachers and students are individuals. Some students expect more plaudits than others. A teacher is allowed to show optimism in his or her natural way. The using of negative words

and especially negative adverbs should be avoided because the meaning of those emphasizes on the Internet. The optimism can be expressed for example with positive words and humour, and by highlighting positive things. (Jasu-Kuusisto &c. 2007, 33-34.)

3.8 Feedback and Evaluation

Giving feedback, evaluating or grading a course are not the same thing, but they all are very important items of a web course. The feedback promotes student's learning and the evaluation is the best way to show how a student achieves the learning objectives during a web course. To the evaluation is connected numeral and verbal grading. (Jasu-Kuusisto &c. 2007, 28.)

Sometimes the grading can be marked only with the words "accepted" or "failed" (Jasu-Kuusisto &c. 2007, 28). There can be many variations of giving feedback and evaluation. Everything depends of a teacher who's in question and his or her preferences and teaching style.

In a web-based learning the meaning of feedback is huge to learner. Receiving feedback encourages learner. It guides him or her to notice possible failings in solutions of exercises and to search new solutions as well. It also helps a student to see different ways to go on with the studies. (Kalliala 2002, 133.)

A learner gets written feedback via the web and reads it normally alone. Feedback is not allowed to be knock-outing or that it shows only learner's mistakes. Questioning feedback is better than accusing feedback. (Kalliala 2002, 133.) Optimism in giving feedback can be shown with good examples from group's own returned exercises, by building up group's or student's achievements and by using a passive form when giving reconstructive feedback. (Jasu-Kuusisto &c. 2007, 34.)

The giving of feedback is student's guiding by verbal means. For a student is told which things in an exercise were made in a right way and which need correction. He or she can get tips how a returned exercise can be improved and in which case she or he should deepen his or her know how. (Jasu-Kuusisto &c. 2007, 28.)

Also other things than only returned exercises can be given feedback; for example returning exercises on time and good address in a meeting. It's also good to remember that of everything is not necessary to give personal feedback. But giving feedback only with words "OK" or "fairly good" is not good behavior, it seems careless. The way of giving the feedback can be proportioned to exercise's meaningfulness. (Jasu-Kuusisto &c. 2007, 28.)

A teacher can speed up his or her working by making the evaluation criteria beforehand and pointing to them when giving the written feedback. Personal aspects can be added to feedback by commenting some certain part of a student's work. If an exercise has been the same for everyone, a teacher can give personal feedback, and in addition, a shared group message to all participants of the course. A teacher tells failings and which things were made rightly. There can also be used example answers with which students can compare their answers. (Jasu-Kuusisto &c. 2007, 28.)

The functions of evaluation are to support learner's learning, to guide, to encourage and to motivate a student and also to develop student's self-grading skills (Koli &c. 2002, 60). Self-grading increases student's consciousness of her or his own learning. It gives possibilities to the conscious development of own learning as well. (Silander &c. 2003, 101.)

The evaluation creates a knowledge of the level of student's know how and gives feedback of the profitability of learning. Teacher can also, by evaluation, boost student's positive self-image and motivation. Evaluation can be declaratory, motivating, guiding, developing, controlling, selective or predictive. (Koli &c. 2002, 60.)

A student should be able to trust to the rightness and objectivity of evaluation. Things which are evaluated should be mentioned in objectives of a course. The guiding evaluation helps a student to do decisions which promote his or her own learning and direct learning towards the objectives. In the developing evaluation there are no wrong or right answers, everybody has done an exercise in an own, different way. Development of self-esteem is the most important function of the developing evaluation. (Koli &c. 2002, 61.)

The evaluation indeed is an integral part of a web course and it has to be made in a relevant way. Sometimes couple of words tell the situation, and sometimes there has to be said many things - not forgetting the explanations. Usually objective and logical evaluation and feedback are for a student easy to understand, and that boosts learning.

There can not be any accuses or arrogant behavior from a teacher's side, and students also should take into consideration their lacks of knowledge. They should try to improve their makings next time. It requires skills from a teacher to evaluate exercises in a simple way and at the same time with explanations. From a student it requires maturity to understand what the teacher wants to say. There should always be opportunities to discuss about the issues relating to feedback, evaluation and grading.

4 DIFFERENT WEB EXERCISES

The exercises of virtual courses are probably the most important tools of teaching in VLEs. A course is divided into sections with exercises. So come into being the structure of a course.

Students know the schedule by noticing the returning dates of exercises and a teacher teaches the necessary points with different exercises. Students get information how exercises are given feedback and graded (Jasu-Kuusisto &c. 2007, 6). In some virtual learning environments, students can see and in that way piggyback other students' exercises after returning the own exercise. In that way a student can also learn more.

It is easier for a student if the inner structure of an exercise is always the same. There should be mentioned the following things when the exercise is given: the meaning of an exercise, a goal, a function, materials related to the exercise, a scale of the exercise, an evaluation criteria, how feedback is given, a schedule, directions of returning exercise, the due date and could the exercise be made in a group. With those cir-

cumstances a student understands why the exercise is worthwhile to do, what she or he is expected to do and how, and in what time.

Because the learning happens in a virtual learning environment it is recommend to search information from the Internet for making the exercises. But of course a student can use i.e. library's service. (Jasu-Kuusisto &c. 2007, 8-9.) In addition, there are many journals and magazines available on the net and in a paper form as well.

Picture 5. Studying on the web using literature sources and the Internet

Everybody learns in an own special way. The amount of a student's work during a course must be calculated and a designer of a study module has to make exercises to fill the course within the limits (Jasu-Kuusisto &c. 2007, 9). Teacher should store exercises in a written form for example as word-documents (Jasu-Kuusisto &c. 2007, 26). Usually students make exercises with common writing programs. A good learning material helps a student a lot in making exercise and basically studying the learning material is an exercise.

There's a possibility to take an advantage of different types of exercises in virtual learning. In some course, mathematics has a big role, so it is understandable to use exercises which contain calculations, not exercises which require reasoning. Web courses can include many different exercises, not just one special type. Sometimes exercise's task can be only participating in a net conversation or making a test. Those kinds of exercises can be good exercises for starting the course.

4.1 Information Acquisition

Information acquisition –exercise type is a good way to make a student search information about the subject under way. The type promotes student's own activity, acti-

vates studying and guides information acquisition. The most important offering might be learning of source criticism. At the same time a student also finds necessary information. (Jasu-Kuusisto &c. 2007, 17.)

Information acquisition –exercise is suited every studying field for starting to learn a new case. By acquisition students learn orientating skills. If there is a lot of unreliable information available, it is important to teach a student to separate the reliability and meanings of sources. That develops student's ability to judge the media. (Jasu-Kuusisto &c. 2007, 17.)

When a teacher evaluates the exercise she or he has a possibility to get new information. Teacher can also perceive new links. Links which students have found can of course be familiar for a teacher already. (Jasu-Kuusisto &c. 2007, 17.) It is also good to check up all links.

4.2 Reasoning Exercise

By reasoning a student creates his or her own view of a particular subject and of own field. She or he understands causes and consequences of things. At their best, reasoning exercises promote student's professional growth. The sources help in orientating to the phenomenon of a certain exercise. Reasoning exercises fit complex subjects, which usually require ethical contemplation. (Jasu-Kuusisto &c. 2007, 18.)

Usually it isn't a good thing to make the whole virtual course containing only reasoning exercises. They fit every studying field if the question is about reflecting a student's own know-how and professional completions. The reasoning can be a part of other exercises like information acquisition and reporting exercises. (Jasu-Kuusisto &c. 2007, 18.)

Sometimes some things are quite hard to think and to realize. Reasoning with a material which contains tenable facts may be the best way to make a student reflect, deliberate and learn things in question. These kinds of issues can be for example examination of human actions which have a connection with environmental aspects.

4.3 Compilation Exercise

By a compilation exercise, different documents, schemes and programmings are easy to return. In some courses the result of a learning process is generally some document. In Learning Management Systems other students can often view others' works and sometimes they even grade other students' exercises. It is also easier for a teacher when all documents are returned into same place during the course because he or she doesn't have to use e-mail for that purpose. (Jasu-Kuusisto &c. 2007, 20.)

This type of exercise goes well with situations when students create very different documents even if the exercise was the same for everyone at first. Students can learn new ways to make a document by seeing other students' documents. By compilation exercise a student learns to make a logical document which's starting point is some real situation. He or she learns to understand the meaning of the document planning. (Jasu-Kuusisto &c. 2007, 20.)

4.4 Reporting Exercise

Reporting exercises are clearly related to the learning of new things. This exercise type contains information acquisition, observation and sometimes also a student's own activity. By a reporting exercise a student has an opportunity to extricate him- or herself from virtual environment and go to get to know a surrounding society, an occupational practice and working life or to do something by him- or herself. (Jasu-Kuusisto &c. 2007, 22.)

This type of exercise itself is an information acquisition –exercise. It fits especially studying occupation practices. A teacher has a good opportunity to use her or his creativity in ideating exercises. (Jasu-Kuusisto &c. 2007, 22.)

The exercise prepares a student for making the thesis in which usually the question is about similar information acquisition and observation processes and reporting of those things. The exercise thereby evolves information acquisition skills and guides the creation of knowledge. It's worth to direct a student with content and form re-

quirements of a report. A report can also be for example a digital photo or a multimedia show. (Jasu-Kuusisto &c. 2007, 22.)

4.5 Case Study Exercise

In a case study exercise a student deliberates things by some example. These exercises are good in virtual learning because in those exercises a student has to produce text by- him or herself. When all members of the team have different examples, there come up many viewpoints. (Jasu-Kuusisto &c. 2007, 23.)

A case study can work in many different ways as a part of an exercise. It can be a basis of an exercise. To it can be attached already existing reflecting of information. Students can produce their own cases which are then reviewed throughout a subject matter. (Jasu-Kuusisto &c. 2007, 23.)

A case exercise suits situations in which the studied thing is wanted to bind to the real world. Problem situations in the real working life and ironing out those problems are typical ways to use the example cases. The case exercise can motivate some students more than maybe other types of exercises. (Jasu-Kuusisto &c. 2007, 23.)

A case study helps in understanding the importance of some situation and the connection with working life. By the case exercise a student learns to understand causes and consequences of things and to analyze practical details of situations. A student receives concrete skills for decision making. (Jasu-Kuusisto &c. 2007, 23.)

4.6 Calculations and Tests

Web exercises can also be used when is wanted to give different mathematical tasks and calculations to do for students. There are also different counting programmes and students should know how to use them. With a mathematical exercise a teacher gives often individual feedback because it helps a student to learn a lot more than if a student glances through alone some example answer. (Jasu-Kuusisto &c. 2007, 25.)

Generally speaking individual guidance in mathematics is necessary and the same thing is with using examples. Situations where students can ask help from a teacher are very important. In a VLE, teachers can tell what exercises students should do and they can give examples there as well but ordinary classroom teaching in mathematics is still a very good place to teach mathematics.

The using of diagnostic tests is a good and quickly way to find out the know how of a student. For a student it is easy to repeat a test and evaluate his or her know how. Tests usually work as a motivation tool and students can easily see their situations. (Jasu-Kuusisto &c. 2007, 25.)

Tests are good ways to teach terms related to the profession. Tests fit handling such things which's answers are unambiguous. Tests are often used in the way that they serve rote learning. The using of tests could be an effective way to learn for example concepts which are related to the jargon. (Jasu-Kuusisto &c. 2007, 25.)

5 VIRTUAL LEARNING IN THE FUTURE

Virtual learning is nowadays a quite common form of learning in universities of applied sciences in Finland at least. But still differences between different units can vary a lot what comes to a virtual learning. For example Learning Management Systems which are in use can be different in different units. Even in comprehensive schools in Finland exist big differences in different schools; at some schools it is normal to use computers as a help of learning and at some schools students know how to use a computer better than a teacher. It is reality now but in the future hopefully it's not.

Virtual learning gives many new and handy tools for learning and teaching. There are many ways to take an advantage of virtual elements. It just needs practicing and informing. People can study some particular subject from different localities with video negotiations and make exercises by the own rate following the virtual material.

But this all needs skills to use multiple technical equipments, writing and verbal skills as well.

The big progressive thing is the using of web pages as sources, and that really needs a good ability to judge the media. If students trust only to sources on the web i.e. to Wikipedia, the progress is going to wrong direction. Information on the Internet is increasing greatly all along. There should thou be source criticism education for the youth. The more massive information flood comes for students and teachers via the virtual environment (VirtuaaliAMK 2005, 1).

Studying at home with a computer saves the environment because people don't have to go anywhere from home. The using of petrol degreases. But at the same time people don't go out, they don't move and get fresh air. They use electricity by doing things with computers. They don't do social intercourse. They get backache and headache. And everybody doesn't have an opportunity to own a computer or an ability to use the net connections. Or if they have, there can always come some new items to update or tricky problems with computers.

If people do courses only by themselves, to witch social group they belong to? A human being needs other people to be with. The question thus is in the proportions of dealing the normal classroom teaching and virtual learning. Being physically together with other people gives a lot. Of course there, in virtual learning environments are opportunities to chat, to be a part of different group discussions. People can also make their profiles in many virtual places but there are always benefits and disadvantages of that kind of action.

Virtual learning is a good thing for both for a teacher and for a student. Virtual learning encourages a student to search information by himself or herself and a teacher can create well functional web courses for students. Things develop, there should be taken into consideration which things are good to take with and which things are good to left behind, and in which measures. After all, the ordinary learning in ordinary classroom is still a good place to teach the students.

Virtual solutions have multiplied the availability of education. The biggest change in learning will be, among other things, the using of electronic libraries. Virtual environment will give for a lecturer bigger audience than before. There are also greater possibilities to use a demonstration material via better than ever net connections. There move voices, motion pictures and simulations. (VirtuaaliAMK 2005, 1.)

There are also for example a machine sight on the way (a camera and a computer together) which can recognize human's actions and react to his or her movements, expressions and motions. That's called the Proactive information technology. Probably they'll use that as a help of learning and teaching. (VirtuaaliAMK 2005, 1.)

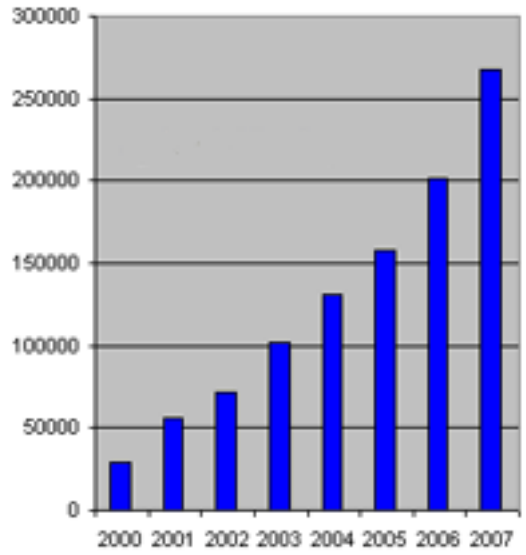


Table 1. The completed virtual learning credits of students of universities of applied sciences in years 2000-2007. The amount of credits achieved by virtual learning is still increasing in the future (tutka.diak.fi).

The amount of a teaching on the web has increased a lot during the past years. Especially universities of applied sciences offer more and more web courses (Mäkelä 2009). The development of virtual learning environment speeds up forcefully the popularity to study on the web (Ahtiainen 2006, 7).

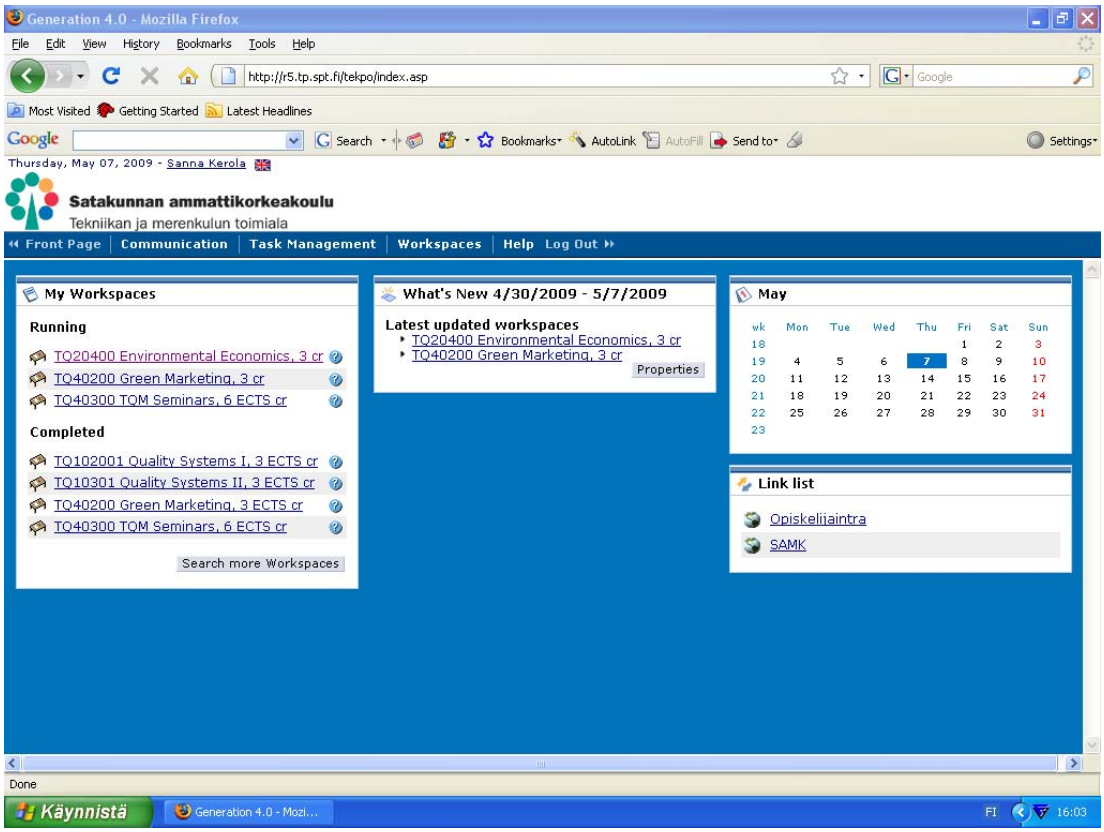
In the future students need skills which are developed by studying on the web. By web-based studying is assured that a student achieves such readiness in information

society which is needed in modern and international working life. (Satakunnan ammattikorkeakoulu 2009.) The using of virtual courses will rise in the future, but at the same time, the need of normal face to face communication will not disappear.

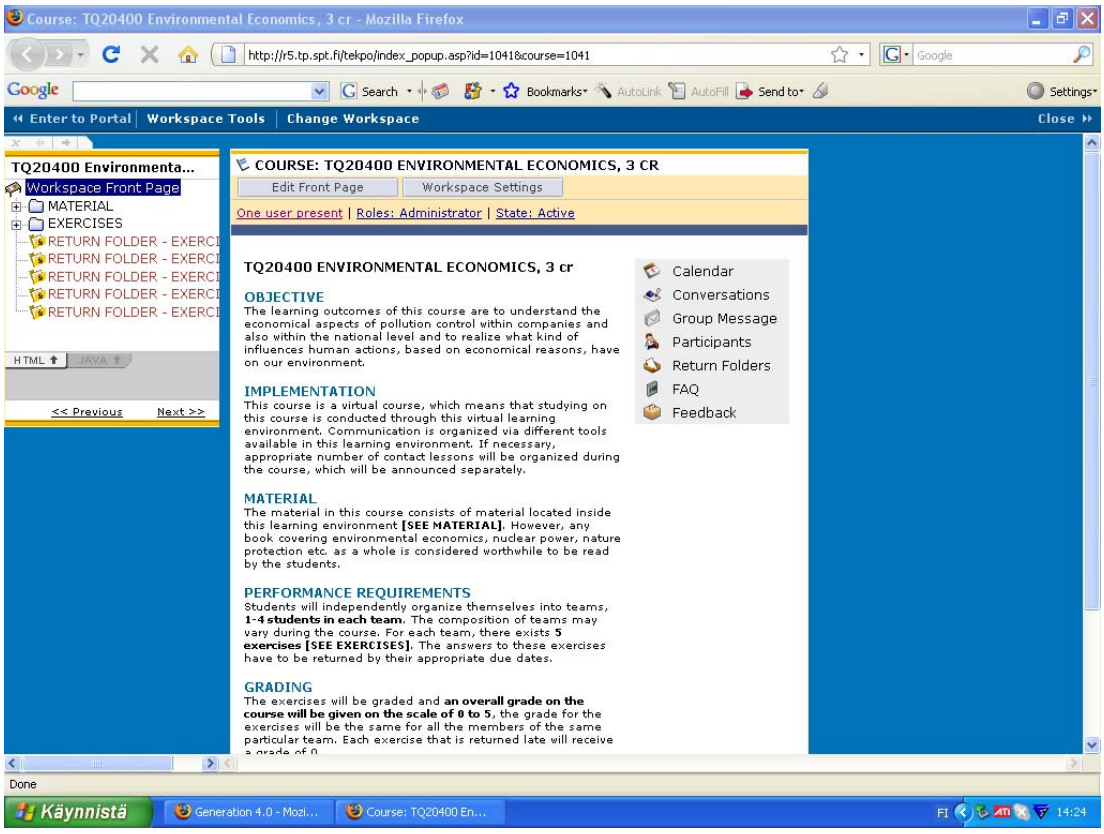
6 ENVIRONMENTAL ECONOMICS COURSE

The Environmental Economics course is a virtual course and studying on that course is conducted through virtual learning environment. Communication is organized via different tools available, mostly by e-mail, in a virtual learning environment. If necessary, contact lessons will be organized during the course.

The course was made for the Faculty of Technology and Maritime Management Pori of Satakunta University of Applied Sciences. It is situated in R5 Portal. The R5 Portal is a Web-based Learning Environment used in Satakunta University of Applied Sciences. After entering to the R5 Portal, a user sees to which courses he or she has an access to. The user enters to the Environmental Economics course and she or he can survey the view where exist: the front page, materials, exercises and return folders for exercises.



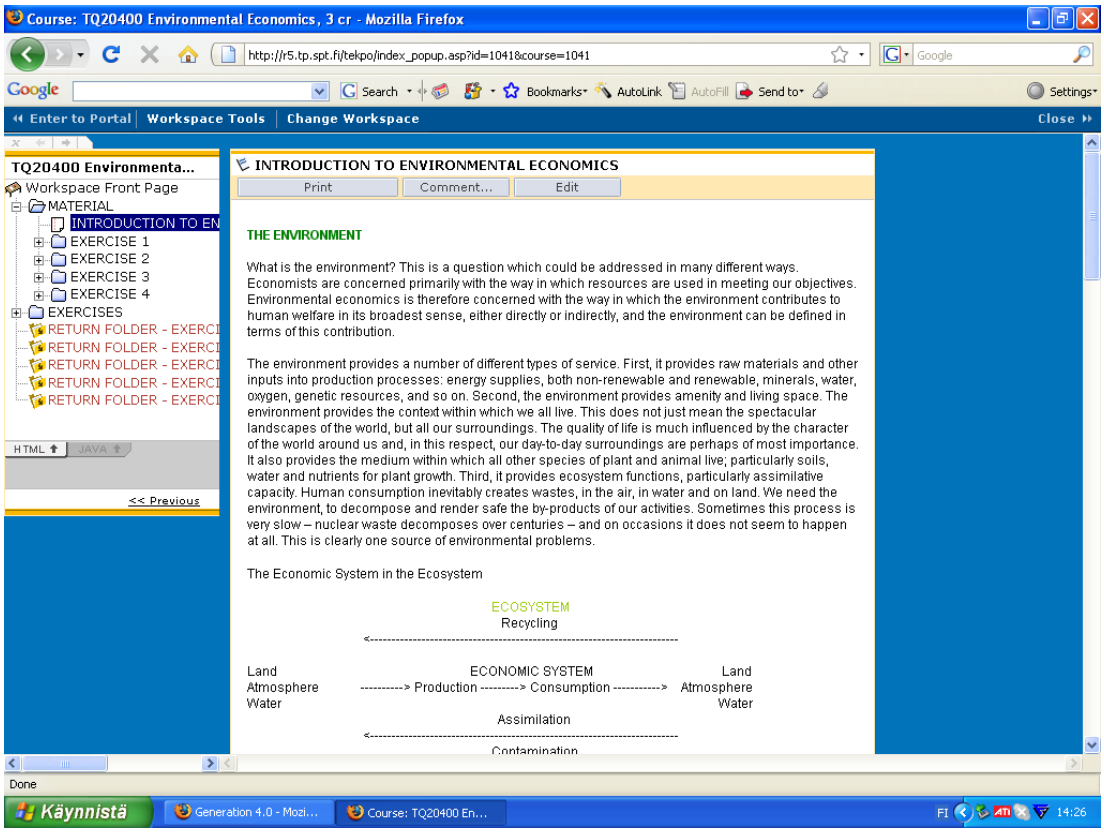
Picture 6. Front Page



Picture 7. Workspace Front Page

The development of material of the course Environmental Economics started in the end of the year 2008. In making the course was used the help of literature, newspapers and Internet. The course was ready for studying during the spring 2009.

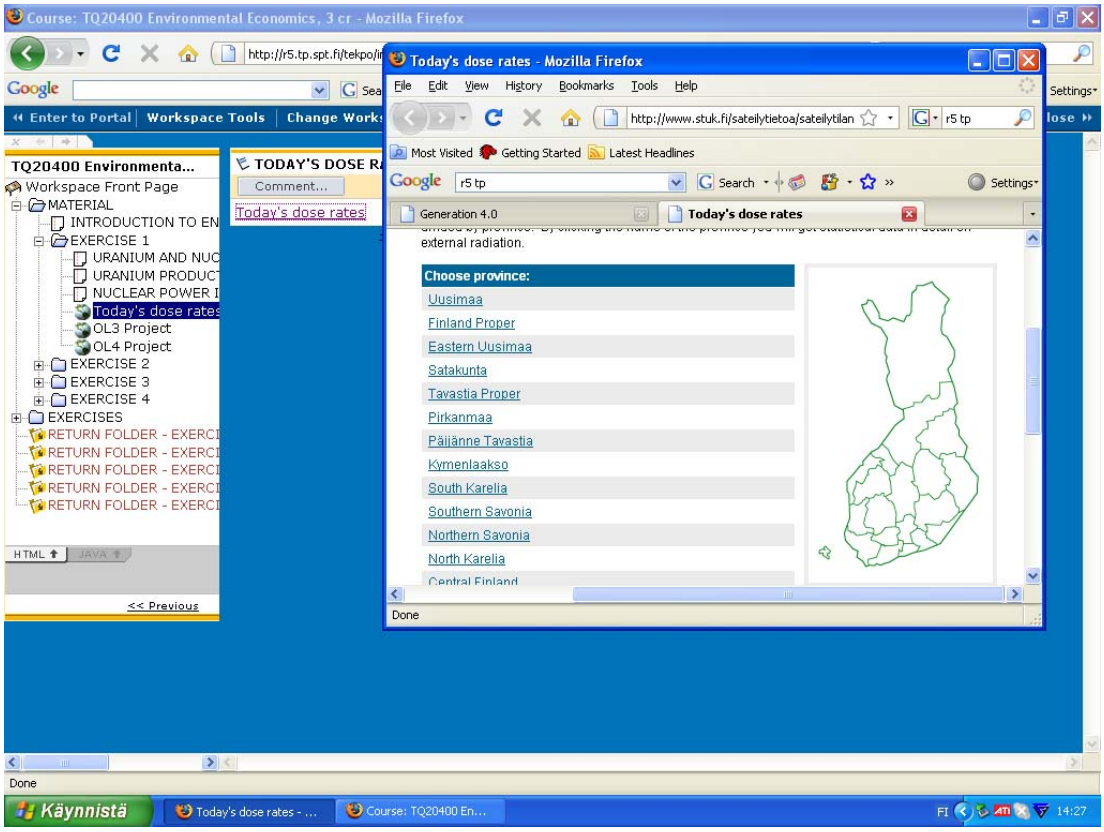
The learning outcomes of the Environmental Economics course are to understand the economical aspects of pollution control within companies and also within the national level and to get the student to realize what kind of influences human actions, based on economical reasons, have on our environment. With the text as learning material is used also pictures, statistics, short videos and external links to different web pages which include necessary and interesting information, photos and statistics.



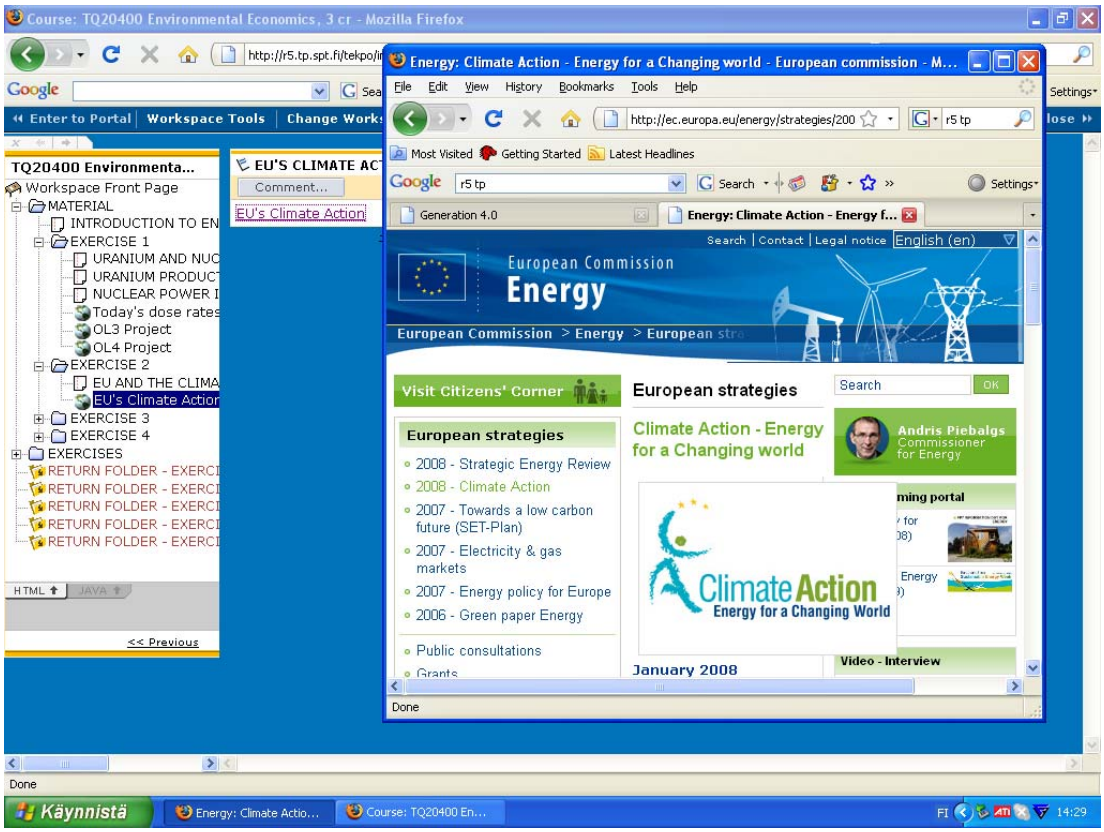
Picture 8. Introduction to Environmental Economics

The material in the course consists of material located inside the learning environment. Student can also use any book covering environmental economics, nuclear power, nature protection etc. as a helping material. Students will independently organize themselves into teams, 1-4 students in each team. The composition of teams may vary during the course.

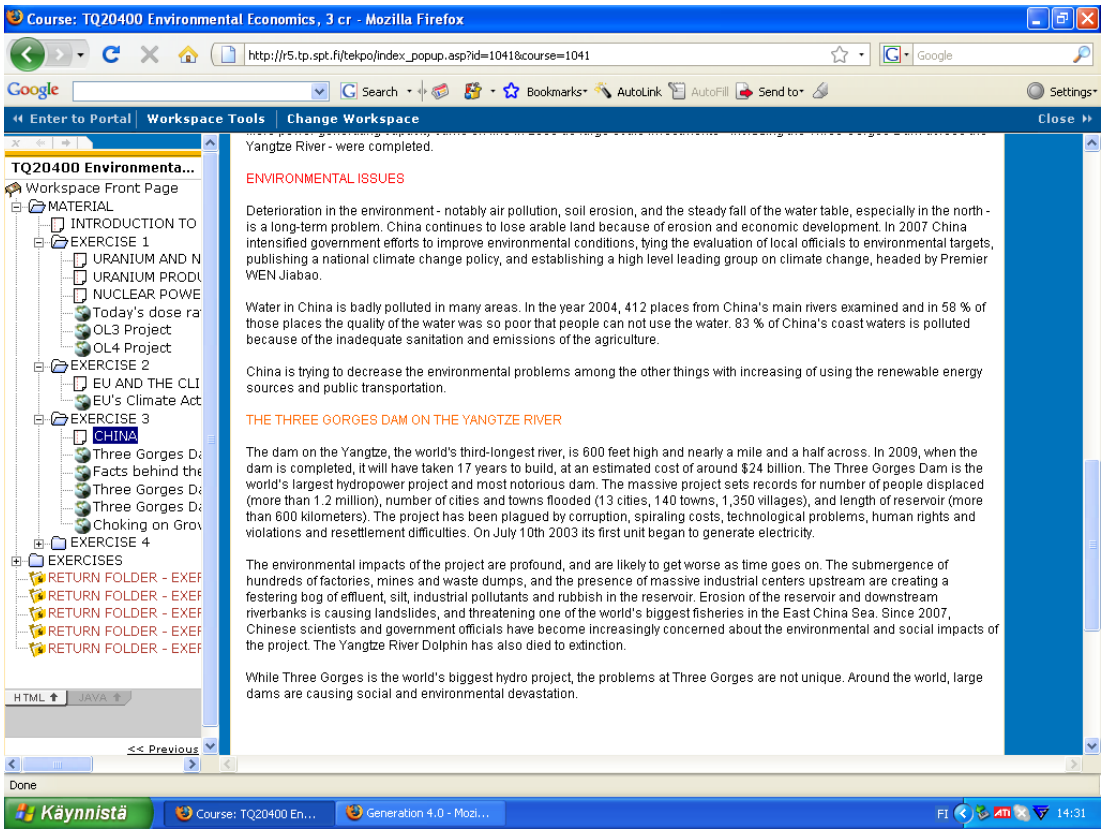
The Environmental Economic course includes five exercises, and each of them includes three to six different questions. Exercises are acquisition information – exercises, reasoning exercises and some exercises include case studies. The subjects of exercises are among other things: the using of uranium and nuclear power, EU's Climate Action Package, China and its environmental problems, The Baltic Sea and its well-being and issues of environmental economics in general.



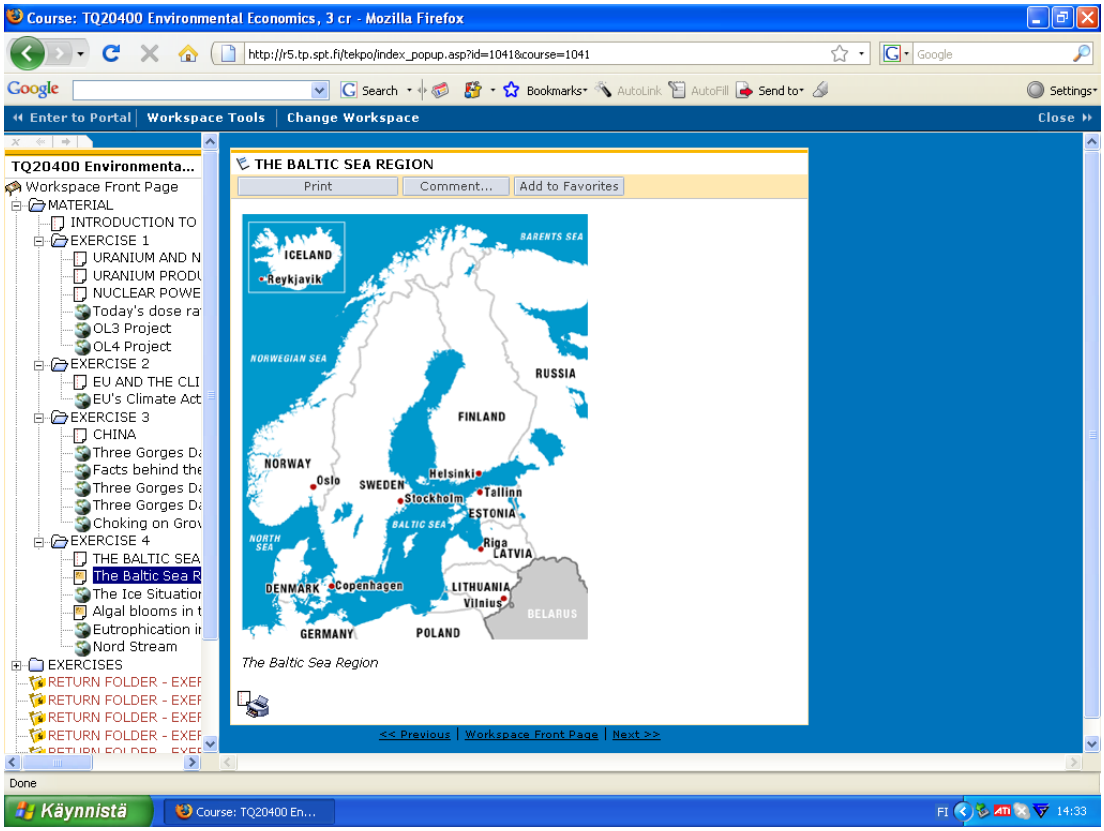
Picture 9. Exercise 1. Nuclear Power. The Using of an External Link



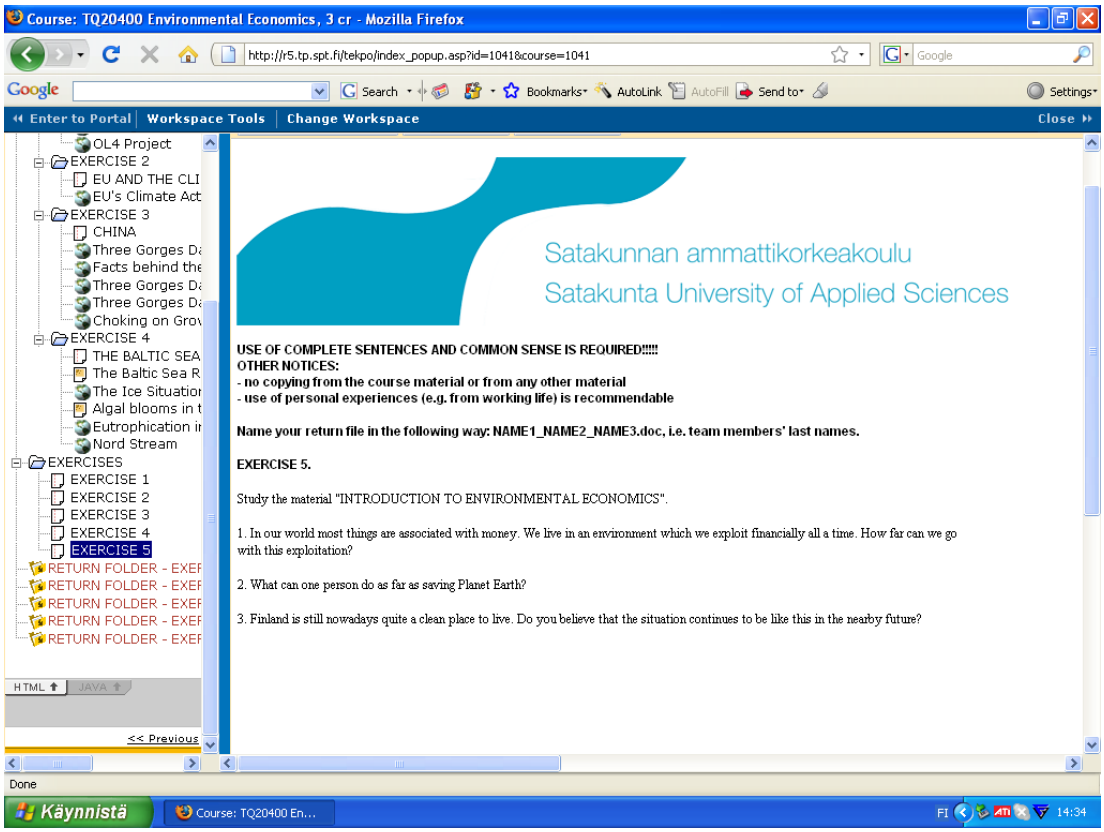
Picture 10. Exercise 2. EU's Climate Action Package



Picture 11. Exercise 3. China and its Environmental Problems. Case Study: The Three Gorges Dam on The Yangtze River

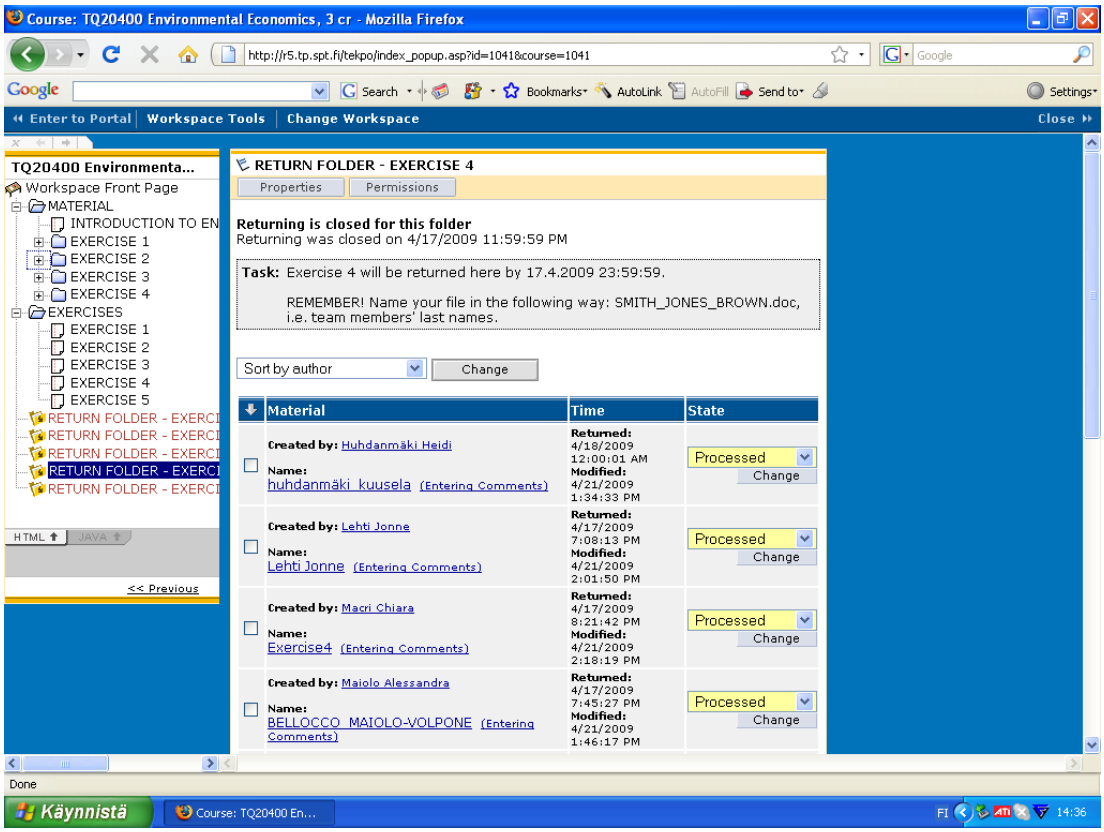


Picture 12. Exercise 4. The Baltic Sea, The Baltic Sea Region



Picture 13. Exercise 5. Questions of Exercise 5

The subjects of exercises were chosen by the maker. They were interesting and meaningful issues which are related to the fact that the environment is exploited financially all the time. The subjects are topical still in the future.



Picture 14. Return Folder

The answers to the exercises have to be returned by their appropriate due dates. The exercises will be graded and an overall grade on the course is given on the scale of 0 to 5. The grade for the exercises will be the same for all the members of the same particular team. Each exercise that is returned late will receive a grade of 0.

7 SUMMARY

After making the course Environmental Economics may say that the development of virtual learning material is not a simple thing. There are many things which have to be taken into account in making a web course. A teacher has to be very good in his or her part (in virtual learning). The material has to be really clear and at the same time challenging for students. In that way the learning process functions and the results of a course are good.

When starting to design a web course, first there has to be made clear the purpose of the course, after that the material has to be workable. Web exercises have to be more even workable than the material. The final and the most important parts of a web course are evaluation and feedback.

The using of a VLE is not so difficult, but still students and teachers need many skills for handling it. It needs very much for a body to sit next to the computer too. And it could be imagined that for someone it really is addicting to use for example the Internet.

This thesis can have a useful part in coming researches. In the future someone can make a virtual course including for example only video material, and he or she can find some information from this thesis of how a web of course could be developed. Of course some one can make a research how the Environmental Economics course works in a studying phase; for example how students answered to the questions and so on, and what kind of feedback was. Someone can interview the students.

The course Environmental Economics was created during six months. The course was offered to students and in that way can be said that the course worked because it was offered. But the next phase will be researching how well students learned during the Environmental Economics course the objectives in target.

This thesis tells the main things about the making of virtual learning material but unfortunately there exist so many things about virtual learning that all things cannot be included to this thesis. Some who has been studying the human's pedagogical development could say that there are missing many points in this thesis. Some pro of information technology could say that there are many lacks in the phases in which is talked about VLEs and other computer based issues. So this thesis is kind of a combination of making virtual learning material in general, including for example subjects which are important for a student.

This thesis brings out things about the situation in which the studying on the web is at the moment. Virtual learning is well-known but at the same time in some places

using of computer as a help of studying is really rare. There are also many disadvantages in learning with computers and many questions still without answers.

The reability of results of this thesis are reliable but things are developing so fast with the Internet and things associated to it, that some things said about those subjects today can be old already tomorrow. Things concisting about virtual learning are same all over the world, but there may be differencies in different countries. It has to also remember that there are still many people who have ever even saw a computer and don’t have no idea what a computer is.

This thesis is useful for example to students who have a task to plan a virtual course or virtual learning material for other students. Of course some other people can as well find nessesery information for their doings. Maybe some students which have chosen the Total Quality Management and Business Processes -degree programme can utilise this thesis in the future.

Actions of a maker of this thesis could have maybe been better and maybe this thesis could have been more well-defined. But the subject, the development of virtual learning material is wide. And of course the English in this thesis could have been more fluent. But for a Finn, it needs working all the time. There could have been used newer and finer techniques in making the virtual course but all the time, all designing goes forwards a lot. In the future this thesis will probably produce benefits for people.

REFERENCES

Ahtiainen, J. Verkko-opiskelun välineet [web document]. 2006. HAMK Hämeen ammattikorkeakoulu Ammatillinen opettajakorkeakoulu. [Referred 10th May 2009]. Available: http://openetti.aokk.fi/ecampus/aatos/5_06/teknologia_verkkoopiskelu.htm

Alamäki, A & Luukkonen, J. 2002. eLearning. Osaamisen kehittämisen digitaaliset keinot: strategia, sisällöntuotanto, teknologia ja käyttöönotto. Helsinki. Edita Prima Oy.

Horton, W. 2000. Designing Web-Based Training. How to teach anyone anything anywhere anytime. New York. Wiley.

Jasu-Kuusisto, K & Mattila, H. 2007. Oppimistehtävä verkko-opetuksessa. Pori. Satakunnan ammattikorkeakoulu.

Kalliala, E. 2002. Verkko-opettamisen käsikirja. Helsinki. Finn Lectura.

Keränen, V & Penttinen, J. 2007. Verkko-oppimateriaalin tuottajan opas. Jyväskylä. WSOYpro/Docendo.

Koli, H & Silander, P. 2002. Oppimisprosessin suunnittelu ja ohjaus. Hämeenlinna. Hämeen ammattikorkeakoulu.

Matikainen, J (edit.). 2003. Oppimisen ohjaus verkossa. Helsinki. Palmenia-kustannus.

Mäkelä, K. 2009. Opiskelu verkossa yleistyy entisestään: Tutka [Internet magazine], 16/2009, 7.5.2009 [Referred 10th May 2009]. Available: http://tutka.diak.fi/artikkeli?id=2439

Verkko-opiskelun merkitys [web document]. 2009. Satakunnan ammattikorkeakoulu. [Referred 10th May 2009]. Available: http://www.samk.fi/opiskeluverkossa/opettajille

Silander, P & Koli, H. 2003. Verkko-opetuksen työkalupakki – oppimisaihiosta oppimisprosessiin. Helsinki. Finn Lectura.

Verkko-oppimisen tulevaisuus ja haasteet [web document]. 2005. VirtuaaliAMK. [Referred 10th May 2009]. Available: https://www.amk.fi/opintojaksot/00003/1059500410556/1059503035070/1059504167837/1060198111643.html.stx

Weller, M. 2007. Virtual Learning Environments. Using, choosing and developing your VLE. London. Routledge.

Wikipedia Internet pages [web document]. [Referred 7th May 2009]. Available: http://en.wikipedia.org/wiki/

Picture 1. People can be in touch with each others from other side of the world in real time. [Visited 6th May 2009]. Available: http://www.grokworx.com/images/virt_portal.jpg

Picture 2. eLearning. [Visited 6th May 2009]. Available: http://www.y2fox.com/learn/images/elearning.jpg

Picture 3. Blended Learning. [Visited 6th May 2009]. Available: http://www.getslearning.com/imgs/blended_learning.gif

Picture 4. Discussion on forum. [Visited 6th May 2009]. Available: http://multimedialearning.com/wp-content/uploads/2009/02/online-debate.jpg

Picture 5. Studying on the web using literature sources and the Internet. [Visited 7th May 2009]. Available: http://www.edu.fi/oppimateriaalit/metallituotemaalaus/images/BD07225_.gif

Picture 6. Front Page. [Visited 7th May 2009]. Available: http://r5.tp.spt.fi/tekpo/

Picture 7. Workspace Front Page. [Visited 7th May 2009]. Available: http://r5.tp.spt.fi/tekpo/index_popup.asp?id=1041&course=1041

Picture 8. Introduction to Environmental Economics. [Visited 7th May 2009]. Available: http://r5.tp.spt.fi/tekpo/index_popup.asp?id=1041&course=1041

Picture 9. Exercise 1. Nuclear Power. The Using of an External Link. [Visited 7th May 2009]. Available: http://r5.tp.spt.fi/tekpo/index_popup.asp?id=1041&course=1041

Picture 10. Exercise 2. EU's Climate Action Package. [Visited 7th May 2009]. Available: http://r5.tp.spt.fi/tekpo/index_popup.asp?id=1041&course=1041

Picture 11. Exercise 3. China and its Environmental Problems. Case Study: The Three Gorges Dam on The Yangtze River. [Visited 7th May 2009]. Available: http://r5.tp.spt.fi/tekpo/index_popup.asp?id=1041&course=1041

Picture 12. Exercise 4. The Baltic Sea, The Baltic Sea Region. [Visited 7th May 2009]. Available: http://r5.tp.spt.fi/tekpo/index_popup.asp?id=1041&course=1041

Picture 13. Exercise 5. Questions of Exercise 5. [Visited 7th May 2009]. Available: http://r5.tp.spt.fi/tekpo/index_popup.asp?id=1041&course=1041

Picture 14. Return Folder. [Visited 7th May 2009]. Available: http://r5.tp.spt.fi/tekpo/index_popup.asp?id=1041&course=1041

Table 1. The completed virtual learning credits of students of universities of applied sciences in years 2000-2007. The amount of credits achieved by virtual learning is still increasing in the future. [Visited 10th May 2009]. Available: http://tutka.diak.fi/artikkeli?id=2439