SOCRATES PROGRAMME

MINERVA- Promotion of ODL-ICT in the field of Education

Project No: 90039-CP-1-2001-1-MINERVA-M

Project Title: SEEKS: Adult learners' information seeking strategies in the Information Society

Deliverable Title: GUIDELINES FOR INSTRUCTORS ON INFORMATION SEEKING STRATEGIES

Date: FEBRUARY 2004

Authors: **Klari-Janne Polder, Bruno Emans, Judith Schoonenboom Mario Barajas, Rudiger Fries, Elisabet Higueras, Barbara Jones, Kathy Kikis, Bob Miller, Henk Sligte**

Deliverable Type **Public**

Deliverable No: **D5**

Work Package: **6**

Eliminado: 3

Project Coordinator: **Dr B.A. Jones, on behalf of Manchester Metropolitan University (UK) b.jones-2@umist.ac.uk**

Partners:

Dr. M. Barajas-Frutos
University of Barcelona (UB),
mbarajas@ub.edu

Dr. K. Kikis-Papadakis
Foundation for Research & Technology Hellas (FORTH),
katerina@iacm.gr

Mr. R. Fries
University of Saarbrücken (USaar),
r.fries@mx.uni-saarland.de

Dr. K-J. Polder
SCO- Kohnstamm Instituut, University of Amsterdam (UAm)
k.j.polder@uva.nl

TABLE OF CONTENTS

1 INTRODUCTION

1.1 Why these guidelines?

The Internet allows access to ever-increasing amounts of information. Within education, most courses now require some knowledge of Internet use, but many students do not have the skills and knowledge for effective information searching and even those that do could probably improve their information seeking skills. These guidelines are intended to provide tools for instructors and teachers to help their students improve their information seeking strategies on the Internet

1.2 The SEEKS-project

These guidelines are based on the results of the trans-national SEEKS project[1]. Within this project, a research framework on information seeking strategies was established[2], which laid the basis for the development of an information seeking provisional taxonomy, methodology and tools[3]. Using this taxonomy and methodology a number of national case studies were conducted using the tools developed to investigate overall appropriateness in examining the information seeking strategies of students and users[4]. An additional outcome of the SEEKS' findings has been a set of guidelines aimed at developers[5]. The several reports containing the results of this project can be found on the website of SEEKS (http://www.seeks-it.net).

The guidelines for instructors in this report are based on the findings of the case studies, and have been tested in practice with both students and instructors, in order to improve their usefulness.

1.3 Student-centred approach

In these guidelines for instructors, a constructivist student-centred approach of learning is followed. This approach has the following consequences for students' information seeking strategies:

- Students' own learning needs and the according information seeking needs are the central starting points for this approach.
- The availability of a variety of information sources, including the Internet, is very important.
- Students have to find their own way to the information sources, and the information seeking strategies they utilise are of key importance.

Chapter 2 gives some theoretical background, for those interested in the constructivist approach, and the role it requires from instructors. The "practical" chapters 3 to 5 can be used and understood without reading the theoretical backgrounds of chapter 2.

After this theoretical introduction, the guidelines discuss four situations in which the instructor can guide students while information seeking on the Internet:

- Setting up information seeking assignments on the Internet in a student-centred learning environment (Chapter 3);
- Classifying students as beginning or advanced information seekers (Chapter 4);
- Direct help and guidance for students while they are seeking information on the internet (Chapter 5);
- Computer Supported Collaborative Learning (Chapter 6).

At the end of the guidelines, six appendices are enclosed that contain tools and instruments that the instructor can use for the guidance of students.

---

[1] SEEKS: Adult Learners' information-seeking strategies in the Information Society, is funded by the EU Socrates/Minerva-program. See: http://www.seeks-it.net

[2] *Reviewing the Research:a discussion towards a methodological framework,* B.A.Jones & A.R.Miller . Del1/WP2/July 2002 Manchester

[3] *Taxonomy and Research Design: results of pilot studies.* M. Barajas-Frutos & E. Higueras. Del2/WP3/Feb2003 Barcelona

[4] UK Case Study (Jones et al 2003), Greek Case Study (Kikis et al 2003), Dutch Case Study (Polder et al 2003), German Case Study (Fries et al), Spanish Case Study (Barajas et al 2003)

[5] *Guidelines for Developers.* R. Fries Del4/WP5/December 2003 Saarbrücken

2 CONSTRUCTIVISM – A THEORETICAL BACKGROUND

2.1 Introduction

In this chapter we discuss the constructivist student-centred approach. We have adopted this approach as it seems to be the most suitable for target groups of adults using the Internet in a lifelong learning context. Constructivism is often opposed to Instructivism, in which an instructor/teacher is the central focal point for instruction, and the learner has a relatively passive role in the learning process. Constructivism means that the *instruction* of the teacher is not the starting point of the learning process, but rather the *construction* of knowledge and ideas by the student himself/herself. Learning is perceived as an *active*, *constructive* process by which the learner builds new knowledges from previous knowledges. New information can come from a variety of sources. The learner's self-directedness is the main guideline in the learning process instead of a teacher-directed standardized course. Our main reasons for choosing this approach can be summarised as:

a) It makes instructors aware of the variety of information-seeking behaviours present among learners and the need to construct learning environments in ways, which accommodate these different behaviours.
b) These guidelines are meant for instructors teaching adults, who have their own personal history and their learning is more vocationally oriented. Keeping in touch with their personal learning (and information) needs is very important for their motivation especially in the context of life long learning.
c) In a competency-oriented environment it is not necessary that everybody learns the same competencies, so a variety of information resources (Internet and others) can be taken into account.
d) The Internet is an information resource, which by its nature, is conducive to constructivist self-directed learning.

2.2 The concept of constructivism

As explained above, the concept of constructivism is centred around the idea that it is the learner that constructs his or her own knowledge, rather than the instructor telling him or her what to learn (Elshout-Mohr, Oostdam & Overmaat, 2002). Within constructivism, *self-regulation* is seen as a variable of great importance (Shunk & Zimmerman, 1994; Wang, Haertel & Walberg, 1990).

Closely related to constructivism is the notion that *powerful learning environments* are required to challenge and stimulate students to act as active and self-directed learners. The general idea is that students are more likely to become active and self-directed learners when they can find out for themselves, which competencies contribute to the achievements of meaningful goals and which knowledge, skills and attitudes enable participants in meaningful projects to act effectively, expertly and professionally. The better, students know from their own experience which learning goals are worthwhile, the more they will be inclined to learn in an active and self-directed manner.
A second characteristic of powerful learning environments is that the students get help to realize their learning endeavours. While self-directed learners are scarcely in need of teacher-directed standardized courses, they are in need of instructors who assist them in the realization and regulation of the learning processes. The instructors' role is to provide coaching and support, to offer brief courses and training sessions, and to refer students to relevant sources of information, such as books, articles and experts.
Electronic communication and information technologies are often seen as a third cornerstone of powerful learning environments. Substantial and proficient application of these technologies by both students and instructors is needed to sustain students' self-directed learning (Kanselaar, De Jong, Andriessen, & Goodyear, 2000).

Learning goals

In a broad sense, we can say that the learning goals in upper secondary education or higher (vocational) education are development of professional competence. We refer to professional competence when students acquire a combination of attributes, such as knowledge, skills and attitudes, which enable them to perform a role or complex task in an authentic, professional context. In comparison to general skills, competencies are equally complex, but competencies are closely associated with particular professions or jobs. While it is relatively easy to formulate well-defined standards and criteria for general skills, this is more difficult for competencies (Wolf & Cumming, 2000).

Learning arrangements

In the constructivist approach learning arrangements are different. Students present different learning outcomes, and the standards and criteria vary accordingly. Even the composition of the assessment panel may be adapted to the particular learning routes of individual students. Therefore, it is impossible to compare this approach with an approach in which students demonstrate their achievements in identical test situations and where identical assessment criteria are used for all students.

The constructivist approach requires that students who have developed competencies by participation in authentic projects of their own choosing should be allowed to demonstrate these competencies in appropriate, and thus potentially different, conditions, and to gain due credits for their achievements (Danau, Verbruggen & Sligte, 1998; Korthagen, Klaassen & Russell, 2000; Simons, Van der Linden & Duffy, 2000).

Assessment procedures

In the guidelines we focus mainly on upper secondary education or higher (vocational) education. In the case of a constructivist training curriculum, the congruency of all components implies two things. First, the assessment system should be individualized and student-centred in order to be aligned to learners' self-directedness. Second, the assessment system should make use of authentic situations for testing in order to be aligned to the learners' competence orientedness. To be successful, new instructional arrangements must be combined with appropriate assessment procedures (Biggs, 1996; Birenbaum & Dochy, 1996; Dierick & Dochy, 2001; Lane & Glaser, 1996). For example, assessment can be done by portfolios. Students present their views and competencies in portfolio presentations and in critical situations. [6]

2.3 Implications for these guidelines

From a constructivist perspective these guidelines are directed towards learning on the Internet, in terms of learning goals, learning arrangements and assessment procedures. In the next chapters more is said about these elements of a learning environment. The hints and tips for instructors are embedded in the broader context of this constructivist approach.

[6] Also related is the concept of Problem-based Learning. Problem-based Learning is a practice-oriented pedagogical model, in which students develop their expertise on the content area in question by working with cases and problems that represent real life situations (authentic problems) (Savin-Baden, 2000).

3 SETTING UP INFORMATION SEEEKING ASSIGNMENTS IN A STUDENT-CENTRED LEARNING ENVIRONMENT

3.1 Introduction

In a student-centred learning approach, the own learning needs and information seeking needs of students are central. Fulfilling these information needs by good information seeking strategies on the Internet are the learning goals for students in these instructors' guidelines. It is important that a student, while searching on the Internet, can follow his or her own learning needs as much as possible, and can use their own seeking strategies. An instructor can take this into account while handing out assignments to seek information on the Internet. The instructor can:

- hand out the assignment in such a way that the student will think of it as his own assignment (ownership);
- decide upon the type of assignment;
- take into account the differences in level of students concerning information seeking strategies.

These three issues will be discussed in this chapter.

3.2 Ownership of an assignment

For students, it is motivating to feel as if an information seeking assignment that has to be performed is 'his or her own assignment', and not something that has to be performed for the instructors. The student has an own interest in the assignment, wants to perform the assignment for himself or herself, and perceives the outcomes of the assignment as important for himself or herself. Assignments can fulfil various types of information needs[7]. In these guidelines, five information seeking needs are distinguished (in appendix 4, an example of each of these five needs can be found):

1. To find a factual answer to a specific question: this could be a *yes/no* answer or a specific fact, which has been asked for.
2. To assemble a list of possible alternatives for subsequent choice: this could involve lists of possible purchases, jobs accommodation offers, holidays etc.
3. Instrumental: to assemble material to solve a problem: for example, finding a recipe on the basis of available ingredients.
4. Confirmational: to assemble material to support a case in a dispute: this could be finding arguments and evidence in a political dispute.
5. Motivational: to acquire the essential background knowledge of a given field of knowledge: this could be gathering information for a school subject.

For students, their own information seeking needs can be formulated more or less explicitly. The instructor can ask the following questions to the student, to make him or her aware of his or her own information seeking needs:

- *What information seeking need do you have, and how can you classify this?*
- *In the description of the information seeking need, what exactly is the question, the choice, the problem, the discussion and/or the subject area?*
- *What knowledge do you already have, and what not? What type of knowledge are you looking for?*
- *Why do you want to search? For example why do you want to answer this specific question, or why do you want to collect that material?*
- *Which method will you use, and why do you think this method is best?*

For an instructor, it is important to make the student the owner of the assignment. This can be done by letting students work as much as possible with their 'own' problems, questions, choices and knowledge areas chosen by themselves or discussions that the students started themselves. It is also possible to use some theme that has been recently in the news, and that is important for students.

[7] Based on Wilson, Ellis, Ford & Foster (1999) and Wilson & Walsh (1996)

3.3 Types of assignments

In student-centred and competence-centred approaches, the focus is on the acquisition of competences in a way that has been chosen by the student himself. This means that *skills* are more important than *knowledge*. An information seeking assignment as in type 1 (see above), in which a precise answer has to be found on a specific question can be used in a student-centred approach, but it has to be treated with care. Students appear to learn more when simple assignments of type 1 (finding a fact) are embedded in broader search questions. It is still good to consider whether it is possible to let the student formulate the questions himself.

3.4 Taking differences in level into account

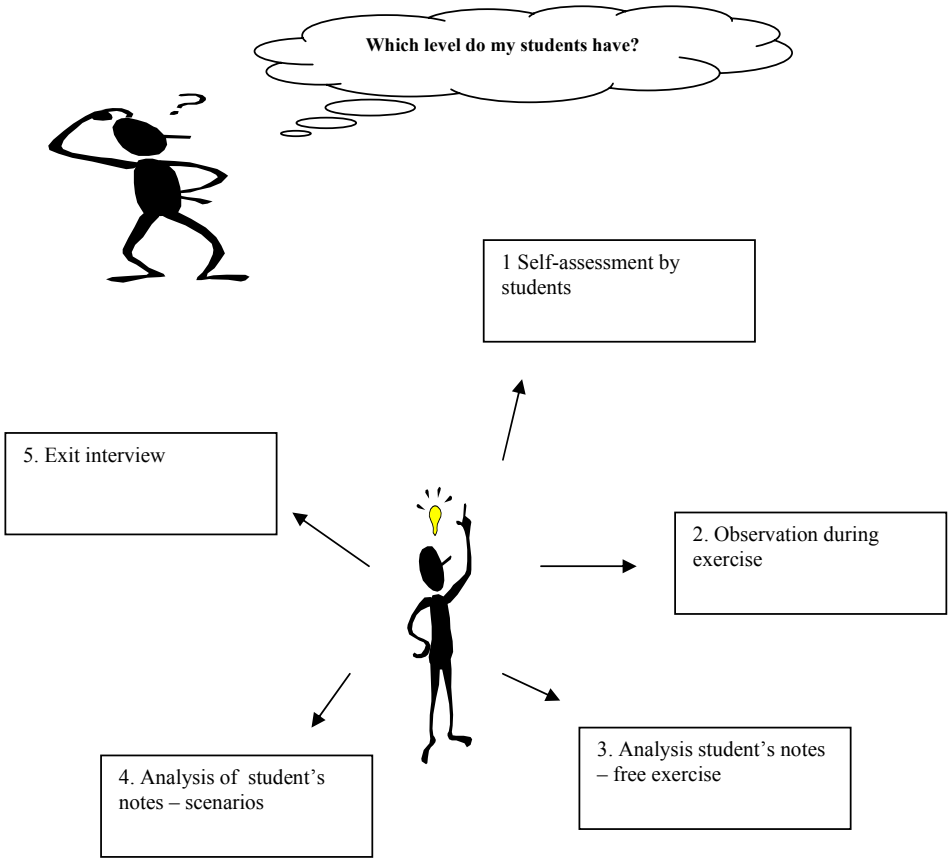
After the classification of students as beginners or more advanced information seekers (see chapter 4), the instructor can take this classification into account when handing out assignments, and when guiding students in their information seeking. For example, the amount of detail that is given in the assignment will play a role, the amount of search terms that is given to the students and the amount of help and guidance that is given during the information seeking process.

4 OBSERVATION AND CLASSIFICATION OF STUDENTS AS *BEGINNING*, *EXPERIENCED* OR *EXPERT* INFORMATION SEEKERS.

4.1 Introduction

An instructor can provide an individual student with help and guidance while seeking for information on the Internet. It is convenient to know, when doing this, whether the student is a beginning, experienced or expert information seeker. In these guidelines, five methods are discussed that an instructor can use to determine the level of students. These five methods are:

1. Self-assessment by the students as beginning, experienced or expert information seeker
2. Observation by the instructor on strengths and weaknesses of the student while seeking
3. Analysis of student's notes by the instructor – free exercise
4. Analysis of student's notes by the instructor – example scenarios
5. Interviewing the student on his seeking strategies in an exit interview



4.2 Determining the student's level

1. Self-assessment by the students as beginning, experienced or expert information seekers

The first method to assess the Internet seeking strategy level of the student is through self-assessment by the student. For this purpose, a short questionnaire on Internet experience is enclosed in these guidelines. The questionnaire consists of four questions, and can be found in appendix 1. The content of the four questions is:

- A classification of the student's own Internet knowledge as no web user, a beginning Internet user, an experienced beginner, an experienced Internet user or an expert user.

- A question to name three Internet search tools.
- A question on own success-rate when searching for information on the Internet.
- A question on the way the student normally seeks information on the Internet.

On the basis of the given answers, the instructor can classify the student according to the following table:

Question 1	**Question 2**	**Question 3**	**Question 4**
Type of searcher	Number of search instruments known	How often does one find information	How does one seek information on the web
No web user	0	Not applicable	Not applicable
Beginner	0 or 1	Almost never	Does not know any search engines or portals
Experienced beginner	2	Sometimes	Portals and/or search engines
Experienced	3	Often	Portals and search engines
Expert	4	Always	Portals, search engines, own ways of searching

Question 1 is the most important question, and in test settings, it became clear that students are quite well capable of making good judgements about their own level of seeking. The questions 2, 3 and 4 can be used to verify the answer to question 1.

2. Observation of strengths and weaknesses of the student as information seeker

The second method to determine the level of information seeking of a student is the direct observation of the student during the seeking process. While seeking on the Internet, four searching phases can be identified:

- Decision phase
- Searching phase
- Browsing phase
- Selection phase

In the Decision phase a person decides what type of information is needed en how to search for it. In the Searching phase the person searches for this information by visiting websites and using search engines. In the Browsing phase a person looks further inside websites for the information wanted. In the Selection phase the person selects the desired information found in websites. After the selection phase, the seeking on the Internet can be ended.

In each of these phases, the beginning, experienced and expert seekers behave in different ways. The criteria, on which the seekers differ, are displayed in appendix 2. The instructor can give a score, on the basis of the observations, on each of these criteria. This can be done with the observation table as displayed in appendix 3. The criteria suitable for this observation method are marked with “direct observation by instructor”.

3. Analysis of student’s notes – free exercise

A third method to determine the information seeking level of students is the analysis of written reports made by the students during their information seeking. With this exercise, the student is free to choose what information to look for on the Internet. The student is asked to make notes on his or her actions during the information seeking. These notes can be analysed by the instructors according to the criteria of appendix 2, using the observation table of appendix 3. The criteria suitable for this kind of analysis are marked with “logbook by the student”.

4. Analysis of student's notes – example scenarios

The fourth method to determine the information seeking level of students is similar to the third method. The difference is that the student does not seek for information of his or her own choice, but has to search for information that is asked for in five scenarios, and make notes while doing so. Each of these five assignments is based on one of the five information needs, described in chapter 3. Five possible scenarios can be found in appendix 4. The criteria suitable for this kind of analysis are marked with "logbook by the student".

5. Interviewing the student on his or her seeking strategies in an exit interview

The fifth method to determine the information seeking level of students is interviewing students after they have been seeking information on the Internet. For this purpose, the questionnaire in appendix 5 can be used by the instructor, either on paper or by face-to-face interviewing. For interpretation, the instructor can use the criteria and observation table (appendices 2 and 3). The criteria suitable for this kind of analysis are marked with "exit interview".

4.3 Determining the student's level in practice

In general, determining the level of information seeking of a group of students will be done by letting them do a self-assessment (appendix 1). This is a good tool to get a quick overview with reasonably accurate scores of the level of information seeking of a large group of students.

The second tool (appendix 2 and 3), the observation of students, can be used less in practical situations, as a longer period of observation of an individual student is required. The qualifications in the observation table cannot be filled in accurately enough when doing only short observations. This tool is therefore only suitable for personal guidance of smaller groups of students. However, the tool is necessary to be able to tell with certainty to which level a student belongs, and where weaknesses can be found.

The tools 3 and 4 (appendix 4) are suitable for small and large groups of students. From experience in test settings, it became apparent that, although students make very short often cryptic notes during the information seeking process, the notes give a good insight in the seeking process of the students, and the mistakes they make. From the notes in the test setting, it became clear that these were the most common mistakes:

- Searching with too few specific search terms, resulting in too many hits.
- Searching with exact the same words as in the assignment, in stead of re-arranging and rephrasing the words to make the best search terms.
- Not knowing how to proceed when the number of hits is too great.
- After a first, not successful search, starting a second search with more global and/or worse search terms.
- Looking at hits that are not relevant for the assignment.

Tool 5 (appendix 5) is suitable for use after a session with Internet assignments (for example a lesson) for one individual student, or a small group of students. After the session, the students can be interviewed, in order to determine their searching level. However, this instrument can also be used for larger groups of students. Questions can then be asked during the seeking process, and not afterwards. By asking the right questions at the right moment, the instructor can help and guide the students during the seeking process. Questions that address those moments when choices have to be made are good questions to guide students, and give them insight and reflection on their own information seeking strategies. (*For example "How did you search for information?" or "Which of these links are you going to open, and why?"*). Furthermore, it gives the instructor insight into the information seeking level of the student.

5 HELP AND GUIDANCE FOR STUDENTS

5.1 Introduction

Next to giving assignments for information searches, and determining the level of information seeking of students, instructors also have to help and guide students while seeking information on the Internet. From observations it becomes clear that Internet information seeking strategies of students can have weaknesses at crucial points: students often do not know what exactly to look for, they do not know what to do when a search has offered them an enormous amount of hits, or they do not know which links are interesting or important and which links are not. The searching process obviously is not perfect yet. This does not mean that students cannot find anything. Sometimes they find the information they need because of their own subject knowledge. It seems that in cases where a student knows something about the subject matter, low information seeking skills are compensated by this knowledge. Only when a student has to search for information that he or she is not familiar with, it becomes apparent that good information seeking strategies are important to find the right information.

5.2 Four phases in searching

Seeking information on the Internet can be seen as following a sequence of four phases, in which the searcher has to make certain decisions. These phases can be followed multiple times, when the right information has not been found yet. The instructor can guide the students by helping them to make the right choices. The choices in the information seeking process are:

Decision phase	Choice on how to search: With a search engine, directly to a known website, using a start page, etc.
	Choice for a specific search engine or start page
Searching phase & browsing phase	In a search engine: choosing the search terms
	On the basis of search results: Choice whether to refine the search
Selection phase	Choice whether to follow a link or not. This can be a link in a list of hits after a search, or a link on a website
	Decision whether to study the contents of an opened web page or not
	Choice whether to use the information that was found on a website
Continue search?	Decision to continue the search or not

It is apparent that an instructor has to guide students on the moments of decisions mentioned above, in order to make students aware of this decision making process.

5.3 Guiding students

The hints and tips that are mentioned below will be more or less effective, depending on the information seeking strategy level of the student, but also on the individual instructor and student. **Instructors have to decide for themselves when and how to use the hints and tips.**

First of all, even before the actual information seeking on the Internet begins, the instructor can help students to become aware of their information and searching needs (see also chapter 3).

After that, the instructor can guide students, when they go through the four phases, while searching on the Internet, and help them with the decisions that have to be made in these phases. In the boxes below, for each phase, some points will be mentioned on which an instructor can support the students. Furthermore, a number of tips are given, that the instructor can give to the students. All these tips are based on the criteria found in appendix 2.

1. Decision phase: starting the search

Helping with: - elementary knowledge of the subject

Tips: - "Try to figure out what kind of question you want to answer"
- "Try to find out what your searching need is"

Clarification:
For the student, it is very difficult to gather information on a subject of which (s)he knows only little. In this case, it can be very helpful when the instructor provides the student with some knowledge of the subject.

Different kinds of information needs are listed in chapter 3.

Starting with search

Helping with: - searching strategies
- specific websites

Tips: - "You could try another starting point for your search"

Clarification:
An instructor can tell a beginner about the use and the possibilities of search engines. An instructor can tell a more experienced user that not all ways of information seeking lead to the same results, and that it might be a good idea to try to use other search engines, starting pages or portals.

For students that have never used the Internet, a special manual "Searching on the Internet" for beginners can be found in appendix 6. This manual lists useful websites with on-line courses for information seekers.

Searching and browsing

Helping with:
- the correct spelling of words
- search terminology, synonyms, related subjects
- teaching Internet skills and knowledge

Tips:
- "You could also try other types of websites".
- "You could try websites with a more difficult language usage"
- "You could try websites that have a more difficult structure"
- "You could try websites that are more difficult to navigate in"
- "While searching, you could investigate multiple alternatives"
- "Try to take the time into account while searching"
-"Try to take the speed of the connection into account while searching"

Clarification:
The correct spelling is very important while searching on the Internet. When a student spells a word wrong, the chances are big that he will not find anything. This effect is even stronger when typing in web-addresses (URL's). In particular this can hinder non-native speakers.

A beginning information seeker has a tendency to look only at websites that are 'easy'. An instructor can explain that websites that appear difficult at first glance can have the information that is needed on the website. The extra investment of time to study this website can be worthwhile.

A beginning information seeker is often satisfied with the first result found. An instructor can explain that possibly better answers are available, and that it might be worthwhile to invest some more time.

Selection of information

Helping with:
- teaching Internet skills and knowledge

Tips:
- "At a website with suitable information, have a look at the links on this page as well, and not only at the page itself"
- "When selecting information, take the reliability into account"
- "When selecting information, take into account the importance of the information for the solving of your problem"

5.4 Example of (the preparation of) a lesson

For a lesson in Internet Information seeking strategies in a real situation, the following steps can be done in the preparation of this lesson:

1. When possible, the self-assessment form can be handed out to the participants of the lesson a couple of days before the actual lesson start (see appendix 1). On the basis of the answers given, the instructor could make a division according to the level of the participants. Students having hardly any experience with the Internet can be provided with the manual for beginners (see appendix 6).

2. During the lesson, the students will do for example the 5 assignments (as described in appendix 4), and will make notes during this exercise, in which they describe the steps they are taking.

3. While the students do the scenarios, the instructor observes a single student (or a small group), using the observation scheme (see appendix 3), and giving a score for the individual

student on each criterion (see appendix 2). For larger groups of students, the short version with only three crucial criteria is more easy to use.

4. After the observation, the instructor can choose one or more students that are not very experienced with information seeking, and can assist these students with the hints and tips described in this chapter.

5. At the end, students can be asked about their searching strategies, according to the questions in appendix 5. Students can answer these questions written (this is more suitable for larger groups) or oral.

6 COMPUTER SUPPORTED COLLABORATIVE LEARNING (CSCL)

6.1 Introduction

Relevance to the ideas of constructivism, can be found in the field of Computer Supported Collaborative Learning (CSCL). When presenting lessons on Internet use, instructors can consider the possibilities of CSCL.

6.2 Collaborative learning

The idea is that it is beneficial for the learning process when students are working and learning together. Expressing your own thoughts, listening to the opinions of your peers, and teaching others invoke a deeper learning of the subject. Furthermore, skills like writing, communication and collaboration are practiced. Since computers and Internet give students the possibilities for easier communication and collaboration, this field of study has regained new attention over the last decade under the name CSCL. When presenting lessons to students, the possibilities of CSCL can be considered. Students can learn much from each other and perhaps even more than from the instructor. Communication and collaboration are essential elements when introducing a constructivist approach to learning, and computers and computer networks provide tools for extended communication and collaboration of learners. In collaborative learning co-construction of knowledge is central to the mutual learning processes of the different participants in interaction with each other. [8] Instructors adopt the model of "how to find out" and they coach the students through the scaffolding and the "guided discovery" strategies. When such a community extends the borders of the classroom-walls, computer mediated communication becomes essential.

6.3 Types of CSCL

In general, five different *types of CSCL* can be distinguished, that might help planning a course on Internet use:

- The first type of CSCL occurs in small groups, behind the computer screen. The communication is face-to-face, and the computer serves only as the tool where the pupils are working on.
- The second type of CSCL is face-to-face collaboration within the classroom, together with the help of a networked computer environment. Often a shared workspace or a networked knowledge-building environment is an element of this type of CSCL.
- The third type of CSCL is where pairs (or groups) of learners in one classroom collaborate with pairs (or groups) in another classroom over the web.
- The fourth type of CSCL is when most of the communication and collaboration is done through the web, but there is also a substantial part of face-to-face communication. This is seen often in higher education.
- The fifth type of CSCL is the type where all the communication is done through the web, and there is (practically) no face-to-face communication and collaboration.

Each type of CSCL means a different learning arrangement. The information seeking assignments (see appendix 4) are especially usable in type 1 and 2 of CSCL.

[8] Theoretical references include the “community of learners” model (Brown, et al. 1993), in particular the notions of constructionism, as defined by Papert (1991), and of “distributed” and “situated” cognition (Lave, 1991). The communication theory applied to the mediation of computer software (Clark & Brennan, 1991) integrates this model. The “community of learners” model links theory to practice and is suitable to investigate into the development of higher order thinking skills. Within such communities students act as cognitive apprentices (Collins et al. 1991) both towards adults/experts present and towards each other.

APPENDIX 1: EXAMPLE QUESTIONNAIRE: INTERNET INFORMATION SEEKING LEVEL

1. Which of the descriptions below describe best your abilities to find information on the web? (choose one)
O Expert: "*I know all the tricks, and I can find what I am looking for within minutes.*"
O Experienced: "*I am pretty good at finding what I need, but I can always use help."*
O Experienced beginner: "*I can find information, but I am not pretty good*."
O Beginner: "*I know how to log on. I can type in the address of a webpage."*
O No Web User: "*I never use the world wide web.*"

2. Name three of your favourite search tools (search engines, startpages) on the Internet
a) _____
b) _____
c) _____
d) I don't know any search tool

3. How often do you find the information you are looking for?
O Always
O Often
O Sometimes
O Almost never

4. How do you search for information on the Internet? (Tick all that is applicable)

O I use search engines, for example _____

O I use portals, for example _____

O I use my own way of searching, namely _____

O I don't know

APPENDIX 2: CRITERIA FOR BEGINNING AND EXPERIENCED INTERNET INFORMATION SEEKERS

Below is a list of 15 criteria on the basis of which beginning and experienced information seekers can be distinguished. With each criterion, the method to observe this criterion is given.

I. DECISION PHASE

Criterion 1: The searcher does differentiate different types of information needs

This criterion indicates that the more experienced a searcher is, the more he will be able to take different types of information needs (see chapter 2) into account when deciding to start a search. When starting a search, the searcher will know (maybe unconsciously) what type of information he is looking for, and which implications this has for the search

No: The searcher will treat any search the same, no distinction between types of information.
A little: The searcher can differentiate between straightforward, factual knowledge and other types of information.
Much: The searcher can differentiate between information needs that require or do not require assembling information and between information types that don't require one single correct or best answer.
Very Much: The searcher has a very good view on types of information and the implications for the search.

Observation: *Exit interview*

II. SEARCHING PHASE

Criterion 2: The searcher uses a variety of different types of starting points

This criterion indicates that more experienced users are able to switch between starting points, depending on the information need.

No: The searcher will usually start from the same website that is known to him or her, for example a search engine.
A little: The searcher has a few different starting points available.
Much: The searcher uses portals, search engines and sometimes will directly go to a known website
Very Much: The searcher has a rich variety of starting points available and can judge the chances of success of each of these starting points.

Observation: *Logbook by students*
Exit interview
Direct observation by instructor

Criterion 3: The searcher visits various types of websites

This criterion indicates that the more experienced a searcher is, the more variety in types of websites will be visited. For such a variety, one can think of searching for information on news sites, thematic sites, news groups, databases and information collections, homepages of individuals, etc.

No: The searcher will stick to one or a few types of websites. He is unaware of the variety in types of websites.
A little: The searcher visits various types of websites, but is unaware of the variety in types of websites.
Much: The searcher visits many types of websites, and is aware of the differences in types of websites.
Very Much: The searcher uses all types of websites efficiently.
Observation: *Logbook by students*
Exit interview
Direct observation by instructor

III. BROWSING PHASE

Criterion 4: The searcher can handle difficult language in websites

This criterion indicates that for beginning searchers, the simplicity of the language used in website is of more importance than for experienced searchers, although for the latter category it plays a role as well. Experienced searchers are able to handle information in difficult language use better.

No:	The searcher skips websites that do not use simple language.
A little:	The searcher can cope with websites that are a little difficult in their language use
Much:	The searcher checks whether information is important enough to go through the difficult language
Very Much:	The searcher can cope with websites that use difficult language.

Observation: *Logbook by students*
Exit interview
Direct observation by instructor

Criterion 5: The searcher can handle difficult navigation and interface

This criterion indicates that for beginning searchers, the simplicity of navigation and interface of the website is of more importance than for experienced searchers, although for the latter category it plays a role as well. Experienced searchers are able to handle difficult navigation better.

No:	The searcher skips websites that do not have a simple navigation and interface.
A little:	The searcher can cope with websites that have a little difficult navigation and interface.
Much:	The searcher can cope with websites that have a rather difficult navigation and interface.
Very Much:	The searcher can cope with websites that have a difficult navigation and interface.

Observation: *Logbook by students*
Exit interview
Direct observation by instructor

Criterion 6: The searcher takes number of alternatives into account

This criterion indicates that a beginning searcher is likely to stop when (s)he has found an answer to his or her question, where a more experienced searcher will look at more alternatives, and will check what is the best answer or best information.

No:	The searcher is usually satisfied with the first answer found
A little:	The searcher is often satisfied with the first answer found
Much:	The searcher regularly searches for more information to ascertain the search
Very Much:	The searcher almost always searches for more information to ascertain the search

Observation: *Logbook by students*
Exit interview
Direct observation by instructor

Criterion 7: The searcher takes the available time into account

This criterion indicates that during the searching process, an experienced searcher will take into account the amount of time that various searching methods will cost, where a beginning searcher will not do this. (For example surfing to pages with many images, or judging whether a certain search term might lead to success.) An experienced searcher will be able to make better judgements when comparing the amount of time and the possible success of a certain search method.

No:	The searcher has no knowledge of searches that are more or less time consuming, so this does not play a role while searching
A little:	The searcher has some knowledge of searches that are time consuming and will sometimes abort searches to go to another search method
Much:	The searcher has much knowledge of searches that are time consuming and will often act accordingly
Very Much:	The searcher can easily judge the amount of time a certain search method will cost, and will almost always act accordingly

Observation:
Logbook by students
Exit interview
Direct observation by instructor

Criterion 8: The searcher takes the speed of the Internet connection into account

This criterion indicates that experienced searchers will take the speed of the Internet connection into account, and will not download large documents or web pages when the connection is slow. A beginning searcher will not take this into account.

No:	For the searcher each search is the same. He or she makes no connection between downloading large files and the speed of the connection
A little:	The searcher is aware of slow speeds of Internet, but hardly acts accordingly
Much:	The searcher is aware of the speed of the Internet connection and often acts accordingly
Very Much:	The searcher is aware of the speed of the Internet connection and almost always acts accordingly. Furthermore, he knows tips and tricks to speed up the information search (e.g. skip parts of web pages etc.).

Observation:
Logbook by students
Exit interview
Direct observation by instructor

IV. SELECTION PHASE

Criterion 9: Use of links inside websites

This criterion indicates that with more experience, a searcher is better able to understand the link structure in a webpage, and is therefore more likely to follow the links in a webpage.

No:	The searcher only looks at information on first page of website.
A little:	The searcher sometimes follows links within web pages, i.e. menus.
Much:	The searcher often checks the links in web pages.
Very Much:	The searcher easily understands web pages and follows the logical links, where (s)he expects to find the information desired.

Observation:
Exit interview
Direct observation by instructor

Criterion 10: Selection of difficult websites

This criterion indicates that a beginning searcher will only select information on a webpage with a simple and clear interface, where an experienced user also checks web pages that are more difficult.

No:	The searcher usually selects information of a web page with a clear and simple interface.
A little:	The searcher sometimes selects information of a web page with a difficult interface
Much:	The searcher can select most web pages. He or she rarely skips pages because of difficult interface.
Very Much:	The searcher can select web pages with a difficult interface.

Observation: *Exit interview*
Direct observation by instructor

Criterion 11: The searcher takes own subject knowledge into account

This criterion indicates that a beginning searcher does not know how to use his or her subject knowledge when looking for information, where an experienced searcher will make much use of his or her subject knowledge in the searching strategies. For example by using synonyms, or by being aware of websites that might contain the needed information or links to the needed information.

No:	The searcher is usually not able to use his or her subject knowledge to improve the searching strategies.
A little:	The searcher is sometimes able to use his or her subject knowledge to improve the searching strategies.
Much:	The searcher often uses his or her subject knowledge to improve the searching strategies
Very Much:	The searcher almost always uses his or her subject knowledge to improve the searching strategies.

Observation: *Exit interview*
Direct observation by instructor

Criterion 12: The searcher takes own web knowledge into account

This criterion indicates that a beginning searcher will not be guided by own web knowledge when looking for information where experienced searchers will make much use of their web knowledge, for example by varying and improving search methods, visiting promising websites, understanding the results generated by search engines etc.

No:	For the searcher each search is the same, (s)he can only follow linear paths which are always the same.
A little:	The searcher has some knowledge of search engines and is sometimes able to use his or her web knowledge to improve the searching strategies.
Much:	The searcher has good knowledge of search engines and promising websites and often uses his or her internet knowledge to improve the searching strategies.
Very Much:	The searcher has excellent knowledge of search engines and understanding the results, and almost always uses his or her web knowledge to improve the searching strategies.

Observation: *Exit interview*
Direct observation by instructor

Criterion 13: When selecting information, the searcher takes the reliability of websites into account (also of unknown websites)

This criterion indicates that more experienced users will (sometimes unconsciously) take the reliability of information on websites into account but more consciously, they will counter check for example the date of a webpage, or judge the reliability of the organisation on the website. Beginning searchers do not judge the reliability of websites

No: The searcher usually does not judge the reliability of websites.
A little: The searcher is aware that information of certain institutions and organisations might be more reliable than that of others
Much: The searcher can make a good judgement of the reliability of a website based on URL, lay-out, language use, resources etc.
Very Much: The searcher can make a very good judgement of the reliability of a website based on URL, lay-out, language use, resources etc. and by checking the date of a website.

Observation: *Logbook by students*
Direct observation by instructor

Criterion 14: The searcher has confidence while selecting information

This criterion indicates that an experienced searcher has more confidence when selecting websites or information.

No: The searcher finds information, but is usually not confident that the best possible information is found
A little: The searcher sometimes is confident that the best possible information is found
Much: The searcher is often confident that the information found is good enough
Very Much: The searcher almost always is certain that the information found is the best information available

Observation: Exit interview

Criterion 15: The searcher takes the relevance of information into account

This criterion indicates that an experienced searcher will take the importance of the information for his or her searching need into account, where a beginning searcher will not do this. This is especially true for information needs where information has to be gathered, or confirmation has to be found.

No: The searcher usually treats all information that (s)he found as having the same relevance.
A little: The searcher sometimes takes the relevancy of information on the website into account.
Much: The searcher often takes the relevancy of information on the website into account.
Very Much: The searcher is almost always perfectly aware of the relevancy of websites, and thus decides to use it or not.

Observation: *Logbook by students*
Exit interview

Overview of observation methods per criterion.

Observation method \ Criterion:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Exit interview	X	X	X	X	X	X	X	X		X	X	X	X	X	X
Logbook by students		X	X	X	X	X	X	X	X		X	X	X		X
Direct observation by instructor		X	X	X	X	X	X	X	X	X					

APPENDIX 3:TABLE FOR OBSERVATION AND CLASSIFICATION OF INTERNET INFORMATION SEEKERS

Phase/ Criterion	Passive Searcher	Selective Searcher	Dynamic Searcher	Expert Searcher
Decision phase				
1.differentiates types of needs	No	A little	Much	Very much
Searching phase				
2.Variety in starting points*	No	A little	Much	Very much
3.Variety in types of websites visited	No	A little	Much	Very much
Browsing phase				
4.Can handle difficult language in websites	No	A little	Much	Very much
5.Can handle difficult navigation & interface	No	A little	Much	Very much
6.Takes number of alternatives into account*	No	A little	Much	Very much
7.Takes time into account	No	A little	Much	Very much
8.Takes speed into account	No	A little	Much	Very much
Selection phase				
9. Use of links inside websites	No	A little	Much	Very much
10. Selection of difficult websites	No	A little	Much	Very much
11. Own subject knowledge leads search	No	A little	Much	Very Much
12. Own web knowledge leads search*	No	A little	Much	Very much
13.Takes reliability into account	No	A little	Much	Very much
14. Takes confidence into account	No	A little	Much	Very much
15. Takes relevance into account	No	A little	Much	Very much
Stop the search				

In the table above, 15 criteria have been listed that give insight in the level of information seeking strategies of students. These criteria are not always equally important, and some of them are easier to observe than others. For example, the start of the search is very important: Is the searcher capable of choosing different starting points, independent from the assignment? It is possible to check this after the exercise in the notes made by the students. This can also be checked in the exit interview (for example by asking "Do you always start searching on the same place, for example a search-engine, or do you use various alternatives for starting your search?").

Three rather easy-to-observe categories, that are important to get a clear insight in the searching level, are marked with an *. This short version with three criteria is easier to work with for instructors in bigger groups of students.

In the further phases of the searching process, it is important to judge whether searchers are capable of using different types of websites, and whether they do visit several alternatives (for example to compare the information found with other alternatives). This can also be observed from the notes made by the student during the assignment. Additionally, the instructor can check it also in the exit interview with the student.

During selection of information it is important if searchers can judge how reliable the information is, and if they can see quickly whether information on a webpage is relevant for them. It is possible to check this in the exit interview, but answers are sometimes difficult to interpret. This is why it has to be asked and checked very carefully.

The other categories are of less importance, and can be checked in the exit interview if there is enough time, and if there are uncertainties on these points.

APPENDIX 4: ASSIGNMENTS AND EXAMPLE OF INVITATION TO PARTICIPATE LETTER

EXAMPLE LETTER

Dear ……..…… ,

You are going to attend a lesson where you will learn searching the Internet in an effective way.
During the lesson, you're going to work on five searching assignments (scenarios) using the Internet. You have to try to find the best possible information to solve the problems in the scenarios.

We are interested in <u>how</u> you search, rather than what you find, as with this information, we can assist you in the best possible way. Finding the right answers is not the most important

You will have about one hour for the 5 searching assignments. The assignments will not be equally difficult, and will not take the same amount of time. The assignments are different in nature, to resemble the different types of information that can be searched for on the Internet.
The supervisor will give you a sign if you use too much time on one assignment. When this happens, it is not problematic that you haven't finished the assignment. Just continue with the next one.

We ask you to make notes about your approach during each assignment (Where did you start searching? Which kind of decisions did you take? What websites did you visit? What difficulties did you encounter during the search?) As said, we are interested in the way of searching and not in the final results.
In the meantime, the instructor will assist you as much as possible. The instructor will help you on basis of the questionnaire you filled in before the lesson; the notes you write during the exercise; and on basis of observations made by the instructor during your search on the Internet.

Enjoy!

EXAMPLES OF ASSIGNMENTS: which can be adapted to cultural contexts

Assignment 1 Weather reporter

Someone tells you that a weather reporter of your national TV network, namely …….. (**The instructor can insert an appropriate name**) has never studied meteorology. You can't imagine this is true. Try to find out whether this is true (by using the Internet)

You can use this space to make notes. Try to give a short description of the searching process during this exercise. It is also possible tot use the backside of this page.

Starting point of your search (which website or search-engine):

Steps taken during the search:

Why did you stop searching:

Difficulties during the search:

Other notes:

Assignment 2 New York

You want to go to New York next month and you don't know the cheapest travel agent for the tickets. You also don't know whether it is cheaper to rent a hotel room over there, or to book a fully organized trip, hotel and flight included. You don't have much money to spend. Try to find the best solution for a trip of one week to New York (explain also why you chose for this particular solution).

You can use this space to make notes. Try to give a short description of the searching process during this exercise. It is also possible tot use the backside of this page.

Starting point of your search (which website or search-engine):

Steps taken during the search:

Why did you stop searching:

Difficulties during the search:

Other notes:

Assignment 3 Birthday of grandmother

Tomorrow it is the birthday of your grandmother. She really likes good food and she is a vegetarian. As a treat you want to cook a delicious and special meal, with only ingredients of the season (dependent of the season: spring, summer, autumn or winter). Try to find recipes on the Internet for a fantastic 3-courses dinner. Also, try to find a suitable picture to put on the menu-card.

You can use this space to make notes. Try to give a short description of the searching process during this exercise. It is also possible tot use the backside of this page.

Starting point of your search (which website or search-engine):

Steps taken during the search:

Why did you stop searching:

Difficulties during the search:

Other notes:

Assignment 4 Political discussion

You have a discussion with your friend about national politics. He says the political leader of your party doesn't have that much political experience. Try to assemble information to convince your friend he is wrong. Try also to find arguments why people should vote for your political party and not for other parties (if you don't have a political party, choose any national party to do the exercise).

You can use this space to make notes. Try to give a short description of the searching process during this exercise. It is also possible tot use the backside of this page.

Starting point of your search (which website or search-engine):

Steps taken during the search:

Why did you stop searching:

Difficulties during the search:

Other notes:

Assignment 5 Visit to your town

Some foreign friends are coming to visit you for a week, and want to see something of your city. You have your own work and appointments for that week, so you can't be their host all of the time. Your friends are especially interested in historical sites. Maybe you have already some ideas of places that might be interesting for your friends, but with the help of the Internet, find much historical and practical information for tourists visiting your town.

You can use this space to make notes. Try to give a short description of the searching process during this exercise. It is also possible tot use the backside of this page.

Starting point of your search (which website or search-engine):

Steps taken during the search:

Why did you stop searching:

Difficulties during the search:

Other notes:

APPENDIX 5: EXIT INTERVIEW

1. What was the starting point of your search in each scenario? Why did you start there? Do you always use the same starting point when searching on the Internet, or can this vary?

2. Did you look for more sources, or did you use the first result found? Why?

3. When you search the Internet, what type of web pages do you normally use?

4. How did you decide that information was relevant (or not relevant)?

5. Did you have a good feeling about the information you found?

6. How did you decide whether certain information was reliable or not?

7. Do you take into account the next things during the search, and if yes, how?

- The language use of websites?
- The easiness of the interface of websites?
- The time you have available for the search?
- The speed of the Internet-connection?

8. Did you take into account the following things during selection of the information, and if yes, how?

- The easiness of the interface of the websites?
- Your own knowledge of the subject?
- Your own knowledge of the Internet?

9. What made you decide to stop searching in each scenario? For example: You were satisfied with the answer found, time pressure, problems with computer or Internet, use of language, gave up hope etc. (Mention all factors that made you stop).

APPENDIX 6: SHORT MANUAL "SEARCHING ON THE INTERNET" FOR BEGINNERS

Introduction

This manual is meant for students that do not have much experience with searching information on the Internet. The manual gives you tips on how to search. But the best way to learn searching information is by doing. Hopefully, this manual will give you the right input to be able to make a start.

Searching the Internet

The Internet is a global network of computers, all connected to each other. Computers attached to the Internet are able to share information, to say it in very simple words. Any computer attached to the Internet can make contact with any other computer that is attached to the Internet. On all computers on the Internet, an enormous amount of information is available that they can share with the rest of the world (you do not have to share all the information on your computer though, but can choose to only share a part of it). Thus when your computer is connected to the Internet, you can have all the shared information on your own screen. But in order to get this information, you have to be able to search for it.

The most well known applications of the Internet are e-mail (sending messages to other people) and the so-called WorldWide Web (WWW). The WorldWide Web is a huge collection of webpages. For displaying webpages, and *surfing* from one webpage to another webpage (by clicking on the hyperlinks), you need a *browser*. A browser is a computer program for displaying webpages. The most well-known browser is Internet Explorer.

On each webpage, information is displayed. And the webpages are interconnected by so-called hyperlinks. Hyperlinks are (often underlined) words, sentences or pictures on a webpage that, when you click on them with your mouse-cursor, will open another webpage. Hyperlinks thus connect information of one webpage with information of another webpage. Please note that sometimes the new webpage will open in the same *window* and sometimes in another *window*. Hyperlinks can be distinguished by the fact that your mouse-cursor (most of the time an arrow) will change into another symbol (for example a little hand) when you go over the hyperlink (word or picture).

In principle, when you have unlimited amounts of time, you can reach any information you need, by clicking with your mouse and following hyperlinks. But this can be very time consuming (as there are billions of webpages, and some pages can be very difficult to find). How can you reach the information you need in a more efficient way? Below, four different methods are described that can help you to find information on the Internet: 1) Going directly to a website, 2) Using bookmarks, 3) Using search engines and 4) Using portals and subject trees.

Going directly to a website

The most easy way to reach the information you need is when you know the address (also known as URL) of the website. You simply type in the address in your browser (the software program that you use to see webpages). The address of a webpage consists of a unique combination of letters, numbers and symbols. An example of an address is www.greenpeace.org (when you want information on Greenpeace). An address almost always starts with a triple of w's (www for WorldWide Web). Then follows a dot, then most of the time a name (e.g. Greenpeace), followed by another dot, and completed with an extension of a few letters. (For English webpages, the extension is .uk, each country has its own extension. For commercial pages, the extension is often .com). But sometimes, webpages can have very difficult names, for example
http://www.tilburguniversity.nl/services/library/instruction/www/onlinecourse/ .

Each webpage has a unique address. When you **exactly** enter this address, you will always reach the correct information. It is very important to make sure that you enter exactly the right address, and check this again, otherwise you might not reach the information you want, or see information that you do not want to see at all. Especially take care with symbols like / and ~.

But how do you get to know the right addresses? You can get them for example from adverts, from school, from friends. Sometimes, you can just give it a try. For example www.football.nl might lead you to information on football in the Netherlands. When you do not reach the information you need through this way (and not even when you follow a few hyperlinks), other tools on the Internet exist that can help you locate the right information. These tools will be discussed in the next three paragraphs. The first is a tool that helps you to locate previously visited websites, where the last two tools help you to find new information

Bookmarking

Bookmarking is an important tool that helps you finding information on the Internet. Once you've visited a webpage that is interesting for you, and you might want to visit it again in the future, you can *bookmark* it. Your browser has the ability to store the address of that particular webpage. This way, you can easily go to your favourite webpages without having to remember long addresses or difficult paths that lead to these webpages. In the browser Internet Explorer bookmarks are stored under the menu item "Favourites". You can also find the option of "Add to favourites" there. In other browsers, words like "favourites" and "bookmarks" are used as well.

Search engines

A tool that you can use to locate information on the Internet is a search engine. Search engines are webpages themselves, but behind these pages is a computer that has searched many webpages on the Internet and remembered the information on these pages. When you enter some words in the search engine, the engine will tell you on which pages of the enormous WorldWide Web these words can be found. When you enter for example "football" into the search engine, you will get an overview of all pages on the Internet that have the word "football" on the page. At this moment, the most used search engine is www.google.com. (Please note that other search engines are available as well).

But now there is a problem: When you enter "football" into Google, it will tell you that more than 78 million webpages are referring to football! That is a little too much to check them all. Sometimes your search will result in too many pages on a subject, and sometimes it will result in too few pages. But there are some tricks that will help you to get precisely the information you want:

1. Use *multiple search terms* (for example "football and youth")
2. Use *quotation marks ("*), because when you use these, only webpages will be listed that have exactly this phrase (for example "Dutch football")
3. Check the *correct spelling* of your search terms
4. Try, when you find too little, to use *Synonyms* of your search terms, or *comparable words* (For example use "soccer" in stead of "football")

Subject trees

Another way of searching the Internet is the use of subject trees or (web)portals. These are webpages that have pre-structured the Internet. On such webpages a number of subjects is listed (for example News, Wheather, Sports, Shopping, Travel, etc). You can click on these subjects, and you will be directed to a new webpage, with again a number of subjects. For example, when you click sports, you will come on a page with football, basketball, gymnastics, etc. You can click on these subjects, and finally you will reach the information you need. An internationally well-known webportal, or subject tree is www.yahoo.com.

Concluding remarks

The Internet is an enormous resource of information. Sometimes it will be easy to find information, but other times it will be very hard. Sometimes information will not be on the Internet, but there is more than you can imagine. When you look for bicycle trips in the southwest of Chile, there will most certainly be someone who dedicated a little corner of the Internet to this subject. With a thorough search, you will be able to find it. And a thorough search often requires much patience. And when you search often, you will become better. So… let's start searching!

Some websites with on-line courses

http://www.sosig.ac.uk/desire/internet-detective.html
An interactive course to learn to judge the quality of information on the Internet.

http://www.tilburguniversity.nl/services/library/instruction/www/onlinecourse/
A course to learn searching on the WorldWide Web

http://www.sc.edu/beaufort/library/bones.html
A basic tutorial on searching the web from the University of South Carolina

http://library.albany.edu/internet
An Internet Tutorial at the University of Albany

http://www.philb.com/webse.htm
Phil Bradley's Website on search engines

LITERATURE SOURCES:

Barajas, M. & Higueras, E. (March 2003). *SEEKS: Adult learners' information seeking strategies in the Information Society. Taxonomy and Research Design: Results of pilot studies. SEEKS Workpackage 3, Deliverable D2.* University of Barcelona, Minerva SEEKS 90039-CP-1. See: http://www.seeks-it.net

Biggs, J.B. (1996). Enhancing learning through constructive alignment. *Higher Education, 32,* 347-364.

Birenbaum, M., & Dochy, F. (1*996). Alternatives in assessment of achievements, learning processes and knowledge.* Boston: Kluwer Academic.

Brown, A.L., Ash, D., Rutherford, M., NakagActive Worldsa K., Gordon, A. & Campione, J.C. (1993) Distributed expertise in the classroom. In Salomon, G. (Ed.) *Distributed cognitions: Psychological and educational considerations*. New York: Cambridge University Press. 188-228.

Clark, H.H. & Brennan, S.E. (1991) Grounding in communication. In Resnick, L.B., Levine, J. & Teasly, S.D. (Eds.) *Perspectives on socially shared cognition.* Washington D.C.: APA

Collins, A., Brown, J.S. & Holum, A. (1991) Cognitive Apprenticeship: Making things visible. *American Educator*, Winter, 1991, 6-11 e 38-46.

Danau, D., Verbruggen, V. & Sligte, H. (1998). *The 'Teachers Survival Kit'*. Guidelines to support teachers with the use of ICT in the learning environment. TSER-Delilah Consortium. Deliverable 12. Maastricht: European Centre for Work and Society/Amsterdam: Centrum voor Nascholing, Universiteit van Amsterdam.

Dierick, S., & Dochy, F. (2001). New lines in edumatrics: New forms of assessment lead to new assessment criteria. *Studies in Educational Evaluation, 27,* 307-329.

Elshout-Mohr, M., Oostdam, R. & Overmaat, M. (2002). Student assessment within the context of constructivist educational settings. In: *Studies in Educational Evaluation*, 28, pp. 369-390.

Fries, R. et al. (2003). *SEEKS: Adult learners' information seeking strategies in the Information Society. German case study report. SEEKS Workpackage 3, Deliverable WP3.D2.3d. University of Saarbrücken*, Minerva SEEKS 90039-CP-1. See: http://www.seeks-it.net

Fries, R. (2004). *Adult learners' information seeking strategies in the Information Society. Guidelines for Developers.* Workpackage 5, Deliverable D4. University of Saarland. Minerva SEEKS 90039-CP-1. See: http://www.seeks-it.net

Jones, B. & Miller, A.R. (June 2002). *SEEKS: Adult learners' information seeking strategies in the Information Society. Reviewing the Research: a discussion towards a methodological framework. SEEKS Workpackage 2, Deliverable D1.* Manchester, Minerva SEEKS 90039-CP-1. See: http://www.seeks-it.net

Jones, B. et al. (2003). *SEEKS: Adult learners' information seeking strategies in the Information Society. UK case study report. SEEKS Workpackage 3, Deliverable WP3.D2.5uk.* Manchester, Minerva SEEKS 90039-CP-1. See: http://www.seeks-it.net

Kanselaar, G., De Jong, T., Andriessen, J., & Goodyear, P. (2000). In Simons, R-J., Van der Linden, J. & Duffy, T. (Eds.), *New learning* (pp. 55-83). Dordrecht/Boston/London: Kluwer.

Kikis-Papadakis, K. et al. (2003). *SEEKS: Adult learners' information seeking strategies in the Information Society. Greek case study report. SEEKS Workpackage 3, Deliverable WP3.D3.1gr. Foundation for Research & Technology Hellas*, Minerva SEEKS 90039-CP-1. See: http://www.seeks-it.net

Korthagen, F., Klaassen, C., & Russell, T. (2000). New learning in teacher education. In Simons, R-J., Van der Linden, J. & Duffy, T. (Eds.), *New learning* (pp. 243-261). Dordrecht/Boston/ London: Kluwer.

Lane, S., & Glaser, R. (1996). Assessment in the service of learning. In E. de Corte & F.E. Weinert *(Eds.), International encyclopaedia of developmental and instructional psychology,* (pp. 805-808). Oxford: Pergamon.

Lave, J. (1991). Situated learning in communities of practice. In Resnick, L.B., Levine, J.M. & Teasley, S.D. (Eds.) *Social shared cognition.* American Psychological Association.

Papert, S. (1991). Situating Constructionism. In Harel, I. & Papert, S. (Eds.) *Constructionism.* Norwood NJ Ablex Publishing.

Polder, K.-J., Emans, B., Schooneneboom, J., with cooperation of Sligte, H. (2003). *SEEKS: Adult learners' information seeking strategies in the Information Society. Dutch case study report. SEEKS Workpackage 3, Deliverable WP3.D2.2nl. SCO-Kohnstamm Instituut; University of Amsterdam.* Minerva SEEKS 90039-CP-1. See: http://www.seeks-it.net

Savin-Baden, M. (2000). *Problem-based Learning in Higher Education: Untold Stories.* Buckingham. Open University Press.

Shunk, D.H. & Zimmerman, B.J. (Eds). (1994). *Self-regulation of learning and performance: Issues and educational applications.* Hillsdale, NJ: Erlbaum.

Simons, P.R.J., Van der Linden, J.L., & Duffy, T. (Eds.) (2000) *New learning.* Dordrecht: Kluwer.

Wang, M.C., Haertel, G.D., & Wahlberg, H.J. (1990). What influences learning? A content analysis of review literature. *Journal of Educational Research, 84,* 30-44.

Wilson, T., Ellis, D. Ford, N. & Foster, A. (1999). *Uncertainty in Information Seeking.* London: Library and Information Commission Research Report 59.

Wilson, T. & Walsh, C. (1996). *Information Behaviour: An Interdisciplinary Perspective.* London: British Library Research and Innovation Report 10.

Wolf, A. & Cumming, J.J. (2000). The inside story: The reality of developing an assessment instrument. *Studies in Educational Evaluation, 26,* 211-229.