



**Suomen virtuaaliyliopisto**  
Finlands virtuella universitet - Finnish Virtual University

[www.virtuaaliyliopisto.fi](http://www.virtuaaliyliopisto.fi)

# Online Learning Research in Finland

Joanne Curry

Suomen virtuaaliyliopiston e-julkaisu 3  
E-publications of the Finnish Virtual University  
<http://www.virtuaaliyliopisto.fi/e-julkaisut/julkaisu003.pdf>  
Sarjan muut julkaisut <http://www.virtuaaliyliopisto.fi/e-julkaisut>

ISBN 951-22-6603-2

## Table of Contents

---

1. Background .....	2
2. Research Funding In Finland.....	3
3. Research in Online Learning in Finland .....	5
4. Facilitating Efficiencies and Multi-Institutional and Public-Private Research Collaborations .....	15
5. Potential Collaborative Research and Knowledge Transfer Opportunities .....	19
6. Conclusions.....	21
 Appendix A: Key Contact People for Sector Overviews.....	 22

## 1. Background

This report identifies the research that is underway in Finland in the development and application of online learning and the organizations and agencies who are funding this research. Key Finnish researchers and research groups are listed and their projects and research are summarized along with potential knowledge transfer and Canadian-Finnish partnership opportunities. The report concludes with suggestions for the Finnish Virtual University consortium on methods to facilitate research in online learning and catalyze multi-institutional and public-private research collaborations.

The information in this report was gathered during a visit programme in Finland from May 31<sup>st</sup> to July 3, 2001 and from subsequent online searches and email contact with Finnish representatives. The primary purpose of the visit to Finland was to learn about the design and implementation issues involved in the establishment of the Finnish Virtual University (FVU). I was the first international visitor invited to review the plans and progress of FVU and was provided with access to people and translations of key documents. During my stay in Finland, I participated in meetings with the FVU Development Unit and a research meeting of the Eastern FVU project. Meetings were arranged with several dozen representatives of Finnish universities and several polytechnics and private sector organizations. I also presented at and attended presentations at the Ed-Media World Conference on Educational Multimedia, Hypermedia, & Telecommunications in June in Tampere, Finland. Other cities visited during my stay included Helsinki and Espoo (the primary base of operation), Rovaniemi, Kokkola, Savonlinna, Oulu, and Turku.

I would like to acknowledge the assistance provided by the FVU Development Unit, the hosts during my information-gathering term in Finland. I am indebted to Mr. Seppo Collan, who initiated my visit program. It was with great sadness that I learned that Seppo had passed away due to illness shortly after my return to Canada.

Thanks to Mr. Matti Sinko and Mr. Kari Salkunen for making introductions to key individuals and organizations in the FVU consortium and for their input to this report.

This report was prepared for and funded by Industry Canada and the Finnish Virtual University Development Unit. As the author, I assume full responsibility for the information and views presented and they do not necessarily represent the views of Industry Canada or the Finnish Virtual University Development Unit.

J. Curry, August 31, 2001

## 2. Research Funding In Finland

### *Research Funding Agencies and Mechanisms*

Finnish researchers and developers can access a number of Finnish and European funding sources that support research in the development and/or application of online learning.<sup>1</sup> In Finland, the key sources of research funding include:

- The Academy of Finland ([www.aka.fi](http://www.aka.fi)) provides funding for basic research in Finland and has been very supportive of new research in the use of technology for learning. Their five-year Information Research Programme completed its first stage from 1996 to 1999 with a second two-year stage underway from 2000-2001. In the second stage, the research themes were defined more closely to cover the social changes caused by the developing information society and the interaction of people and technology. The research themes include: (1) the growing demands on knowledge, skills and competencies - human processing of information, (2) structural changes in the workplace, and (3) human-technology interaction in the acquisition, control and production of information.
- The Finnish national technology agency Tekes ([www.tekes.fi](http://www.tekes.fi)) is the second major funder of public research in Finland and has supported the development of eLearning products. Over 10 universities and a hundred companies are developing new products in the fields of speech technology, personal navigation, and eLearning with support from Tekes.
- Sitra ([www.sitra.fi](http://www.sitra.fi)) is the Finnish national fund for research and development, an independent public fund that finances and implements research, training, and innovative projects in Finland and abroad.

An estimate of the annual funding to online learning research and development from these three organizations is between 3 to 4 million Euros a year.

Finnish institutions and companies have access to European Union (EU) funding programmes. These programmes are described in the publication of the Commission of the European Communities called "The eLearning Action Plan: Designing Tomorrow's Education, Annex: Guide to related programmes and instruments". This publication is available at [http://europa.eu.int/comm/education/elearning/annex\\_en.pdf](http://europa.eu.int/comm/education/elearning/annex_en.pdf). Finnish institutions also receive funding for distance learning infrastructure and equipment grants from the European Social Fund.

Three of the key EU programmes with Finnish involvement are SOCRATES and LEONARDO DA VINCI, which both run until 2006, and PROMETEUS. PROMETEUS is a European partnership for a common approach to the production of eLearning technologies and content that was launched in March, 1999 and ends in 2002. The project provides an "expert opinion-making forum" to bring together a critical mass of expertise in the field of educational technology and applications. Efforts are underway to foster the development of common European and international standards for digital multimedia learning content and

---

<sup>1</sup> The Finnish Ministry of Education web site provides a good overview of research funding priorities and mechanisms at [www.minedu.fi/minedu/research/index.html](http://www.minedu.fi/minedu/research/index.html).

services, produce guidelines and best practice handbooks, and make recommendations to standards bodies and national and international policy makers.

Finnish companies are also active in online learning research and development, primarily in product development for learning platforms and tools. Some examples include Elisa Communications Corporation (eLearning environment), Sonera (Learning Management System Telsipro), ICL Invia (teamware solutions), Teleste Educational (language lab classroom and resource management system and library pilot resource management software), R5 vision (network-based learning environment), LongonetOy (development and deployment of media objects in language learning and teaching), and SanomaWSOY (Opit eLearning environment).

### *New Funding Developments*

With the launch of the Finnish Virtual University and increasing worldwide interest in eLearning including new announcements of European Union cooperation and funding, the funding for research in online learning by Finnish organization is expected to increase. Within Finland, there are two proposed programs that have been submitted to the Academy of Finland. One of the programs is called "Life As Learning" that would be funded under the Research Council for Culture and Society in the Academy of Finland. A working group, chaired by Professor Hannele Niemi of the University of Helsinki, is developing the terms for the program. The program's aim is:

- To encourage the development of a new research culture and new research partnerships around the problems of learning;
- To find a way of managing the challenges of lifelong and life-wide learning in order to avoid a new kind of exclusion;
- To create a solid quality interdisciplinary research base for developing teaching and learning in different educational and working-life contexts; and
- To anticipate future learning needs from the point of view of society, culture, and the individual.

While the program is broadly based around learning in general, there are many issues and opportunities that have been identified related to eLearning (for example, what are the determinants of the impacts of eLearning? How will individuals and groups from different social and cultural backgrounds confront new learning situations such as virtual environments and learning platforms?). Companies are invited to participate in the program's research by means of active involvement and co-funding and new methods of disseminating research results are encouraged. The program has similarities to the Canadian program "Initiative on the New Economy" launched by the Social Sciences and Humanities Research Council.

A second, separate proposal has also been submitted to the Academy for a national, multidisciplinary doctoral program. Thirty to forty students from 8 to 10 Finnish Universities would participate. A translated copy of the proposal will be forwarded to Industry Canada as a separate document.

The following section identifies the current key research groups and projects underway in Finland, the base of research talent and interests upon which such new programs will build.

### 3. Research in Online Learning in Finland

Finnish researchers are well underway in conducting research on the development and/or application of online learning at all levels of education and training. The wide range of current research and number of Finnish researchers involved is evidenced from Table 1, a compilation of 30 researchers or research groups and the topics they presented at Ed-Media 2001, the World Conference on Educational Multimedia, Hypermedia and Telecommunications that was held in Tampere June 25-30, 2001. Table 1 is primarily focussed on academic research but includes a sampling of the many private sector developers in Finland that are developing platforms and tools to support the authoring and delivery of online learning.

From attending Ed-Media and visiting several FVU participants, a number of key academic research groups in Finland were identified that have extensive research experience, a critical mass of researchers and research funding, and international collaborations. These include the following centres or institutes:

#### IQ-Form Research Team, University of Helsinki

IQ-Form is a pilot project for the Finnish Virtual University. The goal of the research project, led by Professor Hannele Niemi of the Department of Education at the University of Helsinki, is to develop a supporting learning environment for the Finnish Virtual University. Tools are being created for students to learn about themselves as learners and acquire skills to become more effective learners in virtual courses. The main tools are called IQ-Form, an interactive databank that gives information about the qualities of students as learners including learning profiles and motivational structures as well as social navigation during their virtual studies. The theoretical framework of IQ-Form is based on theories of mediated learning and distributed cognition as well as Gardner's theory of multiple intelligences and Pintrich and Ruohotie's motivational theory. The research team at the University of Helsinki involves key researchers from the universities of Tampere, Oulu, and Joensuu.

#### Centre for Research On Networked Learning and Knowledge Building, University of Helsinki

The centre consists of 10 investigators who are applying socio-cognitive research on human thinking, learning, and expertise for designing environments for computer-supported collaborative learning (CSCL).

The comprehensive aims of the Centre for Networked Learning Research are:

- to develop and evaluate new pedagogical models which support higher-level cognition in teaching and learning;
- to develop new methods and strategies that foster practices of networked expertise and knowledge management in organizations and communities;
- to test and elaborate the use of tools based on collaborative technology and new media; and
- to design research tools and provide evaluation services for measuring teachers' and students' skills in the use of technology and their conceptions of learning and knowledge.

The centre has close ties to a Canadian research group led by Marlene Scardamalia and Carl Bereiter (OISE/University of Toronto), developers of Computer Supported Intentional Learning Environments (CSILE) and Knowledge Forum. The Finnish CSILE project has set up networks in several Grade Three classrooms in Helsinki and are following development of the same groups of students over four years. The web site of the Centre mentions "CSILE is one of the few technology-enriched learning environments which has been designed by using cognitive, instead of technical considerations. It is based on an ingenious application of recent research on expertise, literacy, collaborative cognition, and complex problem solving. CSILE's design is based on an idea that a computer system should not replace a student's thinking, but guide students to think themselves, providing support at critical stages of the process." The CSILE project is a part of the CL-NET project that is funded by the European Community Targeted Socio-Economic Research Programme.

The centre is also a research partner in the Future Learning Environment (FLE) project started in June, 1997. The first phase of the project is complete. Funded by the Finnish Technology Development Centre, industrial partners, and the Finnish Ministry of Education, the aim of the FLE project is to generate new and innovative learning methods and practices using new media. The FLE project is designing and producing Internet-accessible applications supporting learning and thinking, producing web-based multimedia learning material concerned with new media, and developing the publishing process of network-based multimedia learning materials.

#### mLearning Group, University of Helsinki

The mLearning group at the University of Helsinki is focussing on the development of mobile learning. Among its projects and activities is the UniWap project that aims to develop educational uses of mobile technology and determine the pedagogical applications that will benefit the virtual university. The UniWap project, a joint venture of the Helsinki University and ICL Invia, is in its first stage of discovering new ideas and pedagogical applications in which mobility can benefit the in-service education of university teachers.

A representative of the mLearning group and this project, Janne Sariola, will present at TeleLearning'2001.

#### The Institute for Educational Research

The Institute for Educational Research (IER) is a separate institute of the University of Jyväskylä. The IER's strengths are in national and international assessment and evaluation of education. Institute researchers are investigating and assessing the Finnish educational system and school culture, from pre-school to higher education and the links between vocational and academic education and working life (see [www.jyu.fi/kti/index2.html](http://www.jyu.fi/kti/index2.html)).

One of the important projects being coordinated by the Institute is a project funded by the Academy of Finland under its Information Research Programme's Stage 2. The project is called Collaboration and Authenticity in Technologically Enriched and Virtual Learning Contexts and is funded at the level of 270,000 Euros. The project objective is to investigate the use of information and communication technologies in technologically supported and virtual learning environments, with a special emphasis on information networks. The focus is

on how knowledge is propagated and how significant knowledge is built, from the viewpoint of individuals and the learning community, from pre-primary school teaching to teacher training. The project manager is Professor Pirjo Linnakylä of the University of Jyväskylä. See <http://kti.jyu.fi/top/cato/> for further information.

#### Research Unit for Educational Technology, University of Oulu

This unit co-ordinates the virtual campus of the University of Oulu. They also research, develop and evaluate new learning environments and new models for open and flexible learning and pedagogical use of information technology. The research unit provides study programmes in education technology (Basic Studies and Intermediate Studies in Educational Technology), courses related to information and communication technologies in teacher education, and also doctoral study seminars. The history of the Research Unit is based in the projects dealing with developing and evaluating new learning environments and new models for open and flexible learning and pedagogical use of information technology (EU-projects and national projects). Currently the unit is focused on more basic research on virtual learning and pedagogical models for networked learning and education. Recent research deals with sharing knowledge and understanding in virtual interaction and cognitive and motivational effects of computer supported collaborative learning". One of the research teams has been involved with research studies implementing Carl Bereiter and Marlene Scardamalia's CSILE/Knowledge Forum software.

The University of Oulu has a joint, three-year project with the University of Jyväskylä that is funded by the Academy of Finland. Called "SHAPE, Sharing and Constructing Perspectives in Virtual Environments", the cross-disciplinary project is investigating the nature and quality of virtual interaction in higher education and work place contexts, building on the theories of the role of social interaction in learning as well as on the dynamics of discourse. The output of the project will be theoretically-grounded principles and guidelines for increasing and evaluating the quality of virtual interaction in order to facilitate the design of more purposeful web-based learning models in formal and informal education.

#### Dr. Erno Lehtinen, University of Turku

Professor Lehtinen is one of Finland's key researchers and he has a global reputation in the areas on which he researches including computer environments for complex learning and computer supported collaborative learning. The list of projects he is involved in can be found at <http://users.utu.fi/ernoleh/projects.html>. Some of his current interests include problem-based learning and flexible tools and interfaces for users of common knowledge bases. He is also a presenter at TeleLearning'2001.

#### Educational Technology Centre, University of Joensuu

The Educational Technology Centre is a separate institute of the University of Joensuu. The focus of the Centre is to promote the use and research of educational technology in universities and lifelong further education. It is coordinating some of the implementation projects of FVU (Eastern Finland's Virtual University, a virtual counselling system for students, and services in local portals of universities) and projects financed by the EU. The Centre is also coordinating and promoting the development of virtual instruction and

organizing the development of infrastructure needed in virtual instruction at Joensuu University. A key FVU Project, Feedback from Virtual Learning Environments, has a goal of producing an instrument for developing and promoting the quality of instruction in virtual learning environments. The system will be piloted at Joensuu University and then integrated into the portal of the FVU. The lead researcher is Professor Marja Kallonen-Rönkkö.

#### Eastern Finland Virtual University Network

One of the FVU projects, the Eastern Finland Virtual University Network, has 10 researchers that have begun working on their specific themes of research in three universities: technical university (Lappeenranta University of Technology), medicine and biotechnics (University of Kuopio) and humanities/natural sciences (University of Joensuu). Issues in the design of web courses (learning experiences and the productivity of learning via distance learning, dynamic work sheets in applied mathematics, teacher training practicum over the web). Another study underway is on "Educational Technology in a Cultural Context". Professor Erkki Sutinen and Dr. Esko Kähkönen are examining meaning and application of the cultural factors in the design of educational technology.

Other research groups or projects of interest identified during subsequent investigation include:

#### Hypermedia Laboratory, Tampere University of Technology

The Hypermedia Laboratory does research on fast networks and distance education using video and audio conferences. Researchers are also developing software for mathematics education.

#### TOTY-Research and Development Center for Information Technology in Education

Based at the University of Joensuu, the focus of the Center is research and development work on the educational use of information technology. The research is anchored in the learning research concerned with the individual, the use of particular learning environments and the organization. The Center creates local networks with schools, educational institutes and enterprises.

Helsinki University of Technology project:

#### Experimental Visualized Organizational Learning in Virtual Environments

Funded at 235,000 Euros by the second stage of The Academy of Finland's Information Research Programme, the projects is investigating organizational virtual learning environments with regard to their learning outcomes, applicability and transfer effects. The central question is: how to transfer the experimental experience-based knowledge, which emerges in a virtual environment as a result of using interactive simulation models, back to a business environment. The Project manager is D. Tech Riitta Smeds.

Computer Science Education and Educational Technology, Department of Computer Science, University of Joensuu

In the Department of Computer Science, University of Joensuu, faculty are interested in developing ways to use information technology to transfer the learning in the area of Computer Science Education. Their goal is to study both pedagogical and technical aspects of the information technology in education and main research areas include:

- use of visualization and concretization in teaching
- development of learning tools
- on-line education

In one of the implementation projects, the Virtual Certificate project, they have developed a first-year Computer Science studies program for high school students. The program consists mainly of on-line courses. The goals of the project are:

- to develop ways to teach programming over the Internet at distance
- to improve the learning methods in web-based courses
- to utilize and test the innovative learning tools

The project leaders are Jarkko Suhonen and Erkki Sutinen.

In a second implementation project, the Tanzania Project, the goal is to create a virtual learning environment in introductory computer science for Tumaini University in Tanzania. The material includes first year computer science studies that will be part of wider entity called IT-Diploma in future. Special characteristics of the material are to emphasize the Tanzanian perspective in learning process and notable role of ethics in computer science. At the moment the project is in the phase of producing on-line materials. First versions of the learning materials will be ready by summer 2002.

The project leaders are Erkki Sutinen, Marjo Virnes, and Mikko Vesisenaho.

**Table 1: Research Projects and Activities in Finland**

Summarized from Proceedings of Ed-Media 2001.

Abstracts and full paper available upon request.

	<b>Researcher Name and Institution</b>	<b>ELearning Topic</b>	<b>Education or training sector</b>	<b>Comments</b>
1	Helena Aarnio, Jouni Enqvist; Häme Polytechnic, Vocational Teacher Education College	VETO Project: Networks in vocational training, using web for learning and knowledge construction	Vocational Training	At stage of proposing tentative model and identifying issues in use of networks.
2	Raila Äijö, Johanna Leppävirta; Helsinki University of Technology	Informing design of ICT based learning environment by examining communication and interaction needs of different user groups.	Community-based learning	Conducted an analysis of user needs for community-based learning
3	Risto Aikonen, University of Joensuu	Development project connecting teachers and university instructors using digital learning materials for Greek Orthodox Religious Education	School and university instruction of religious education	Model of connecting teachers in schools and universities that are geographically widespread
4	Nina Forsblom, Tampere University of Technology	Learning environments to support the intercultural study of a foreign language	Russian web-based instruction	Conducted teaching experiments to guide a net learning environment and implemented a web-based learning environment for teaching of Russian. (See <a href="http://Matwww.ee.tut.fi/venaja">Matwww.ee.tut.fi/venaja</a> )
5	Jaana Lukkarinen, Niko Myller, Jarkko Suhonen, Erkki Sutinen, Sirpa Kontkanen; University of Joensuu	Creation of program to teach university-level computer science studies to high school students involving design of a flexible and reliable learning environment	University-level computer science instruction to high school students	Preliminary results indicate students are motivated to carry on their learning.
6	Sami Hautakangas, Pekka Ranta; Tampere University of Technology	Method for describing and evaluating learning environments		Developed method called Integrated Pedagogical Profile, a reconstruction of model of pedagogical dimensions presented by T. Reeves
7	Helene Juhola, Asta Bäck; VTT	Building a system to support the creation, management, updating, and use of different types of training materials		A 3 year project launched Dec., 2000 called CUSTOMDP that is part of the Leonardo da Vinci EU programme.

8	Marja Kallonen Rönkkö, University of Joensuu	Feedback in virtual learning environments to help create learning environments that are beneficial for learning	University learners	Teachers and students provide feedback via email, discussion groups, and digital questionnaires that is processed statistically and using other methods.
9	Marjatta Kangassalo. University of Tampere	Study of use of PICCO program, a spontaneous exploration tool/pictorial computer simulation for science learning	Day care and school learners	Investigation of children's science learning and knowledge construction process in new multimedia technology environments.
10	Marja Kankaanranta, University of Jyväskylä	The use of electronic portfolios for assessment as a means of documenting, displaying, and sharing students or teacher progress	Kindergarten to professional development portfolios	Collaborative effort of researchers from Finland, Australia, and the U.S.
11	Ilta-Kanerva Kankaanrinta, University of Helsinki	Study of attitudes of Finnish Primary school teachers and the Internet	School teachers	Results showed concerns of student teachers worried about students' relationship with the Internet but emotional attitudes were mostly positive on the part of students.
12	Petri Kantola, R5 Vision Ltd.	Creation of network-based learning environment. XML-based and modular structure used to allow use in various organizations and situations.	Across education and training sectors	Finnish commercial development
13	Harri Ketamo, Pori School of Technology and Economics	Development of learning materials with computer-supported user observation.		Study showed a clear connection between usage of learning material and learning results. Fast interaction with few mistakes achieved no learning effect.
14	Harri Ketamo, Jari Multisilta, Jari Lahti, Harri Keiho; Pori School of Technology and Economics	Development and testing of different types of mobile learning environment solutions		Complete system will be tested in Spring'2001. Classroom extension hoped to offer additional value to learning process or motivation.
15	Vesa Korhonen, University of Tampere	Study of assumptions guiding instructional design process for network-based learning environments	University education	Case design reviewed Nursing Science module that used WebCT.
16	Leena Kuure, Saarenkunnas Maarit; University of Oulu; Taalas Peppi, University of Jyväskylä	A discourse approach to the study of effects of technology on learning outcomes		Discussion of appropriate research approaches to capture complexity.

17	Teemu Leinonen, Kai Hakkarainen, Samu Leinonen; Helsinki University of Art and Design	Developing knowledge building software called ITCOLE that provides shared electronic workspaces for students and teachers for asynchronous and synchronous collaboration	Schools and universities and colleges	Building on Canadian product CSILE/Knowledge Forum. ITCOLE will be open source.  Downloadable pilot version at fle2.uiah.fi
18	Jarkko Levasma, Ossi Nykänen; Tampere University of Technology	Developing methods for importing various types of course material into learning environments		Developed method using XML.
19	Jarmo Levonen, University of Tampere	Exploration of the types of learning situations that can be supported by mobile learning devices.		Review of possibilities presented in the literature. Conclusion is that many things are still unknown.
20	Juha Lindfors, University of Oulu	Study of enquiries and exam results of control engineering course that used projects, collaborative learning, hypermedia and WWW to support lectures	Control engineering university course	Results show that students adopted the new methods well and the students who used the network learning environment passed the course as well as previous students.
21	Jukka Maki, University of Oulu	ISDN videoconferencing for music education	Music education in schools	Demonstration of successful model
22	Hannu Markkanen, Espoo-Vantaa Inst. Of Technology	NetPro European project to develop methodologies and web tools for collaborative project-based learning	Tools to facilitate collaboration in cross- institutional learning communities	Stage unknown.
23	Janette Moreno, Marika Helenius, Jarmo Viteli; University of Tampere	Ministry of Education project called VETO. Project is developing and identifying relevant guidelines for the implementation and integration of network-based education in vocational schools.	Vocational schools	Identified three indicators of technology integration (netpedagogy, technology, usability) that were studied in context of vocational teachers' planning, implementation, and evaluation.
24	Pekka Nieminen, Lappeenranta University of Technology	Demonstration of a distance education technology course made available to two international groups of different universities at minimum cost delivered via IP- teleconferencing.	University education	Results for international/distance learning participants was acceptable.

25	Petri Nokelainen, Markku Niemivirta, Henry Tirri, Miikka Miettinen, Jaakko Kurhila, Tomi Silander; University of Helsinki	Creation of an adaptive online questionnaire using Bayesian Modelling approach. Questionnaire, called EDUFORM, creates individual learner profiles. An adaptive graphical user interface is generating.		The profiling of respondents is in most cases obtained after one third of propositions.
26	Katja Pesonen, TUT/DMI/Hyperm edia Laboratory, Digital Media Institute, Tampere University of Technology	Creation and application experiment of Energy!, a hypermedia-based learning environment available through the web.	Learners age 13-18 studying energy issues	Application provides conclusions of the role of technology-based learning environments in energy education.
27	Raymond Silfver, Espoo-Vantaa Inst. Of Technoogy	Participant in a Socrates-funded ODL projected called Computer Network Based Learning in Project Group Environment. Objective is to test working methods in practice and evaluated how academic institutions can benefit from using computer networks.		Project began in 1998 and partners are from UK, Ireland, Netherlands, Germany, Italy, and Spain. Project is in stage of evaluation and dissemination and will end in August 2001. Ed-Media paper reports on experiences. (see <a href="http://Virtual.mbs.fi/virtual">Virtual.mbs.fi/virtual</a> )
28	Timo Parkka; Learning and Research Services	Campus Neo project will develop an integrated environment for distance education and lifelong learning. Nordic universities are intending to establish a new virtual campus. This project will integrate existing services, collaborative learning environments, and communication methods to enhance telepresence among students and university professionals.		Are implementing a combination of asynchronous and synchronous communication tools.
29	Sanna Vahtivuori, Teemu Masalin; University of Helsinki	Focus on designing communal and experimental web-based learning from a learner perspective		Introduce a pedagogically- designed model for web-based learning based on results of an R&D project called TriO undertaken in 1999-2000.
30	Matti Vitikainen; Edusolutions Oy <a href="http://www.Edusolutions.fi">www.Edusolutions .fi</a>	Developed an advanced learning environment called Edulink, based on a previous product that has 1000 users.		Edulink is browser-based, scalable, and supports individual and collaborative learning. Pedagogic instructions are given to different user groups and includes content production and maintenance tools.

### *General Observations*

There is a broad range of research on online learning underway in Finland. Research activities are focussed on the development of models of online delivery (often examining teaching in specific discipline areas such as language learning or computer science), the development of specific tools, and the development and testing of research and evaluation methodologies. Particularly with the recently initiated projects, some promising directions include the move away from extensive tool and platform development (which is being taken over by private companies) and the focus on the development of models, particularly for web-delivery, and the evaluation of their effectiveness. A number of projects are examining language learning using the web and cultural issues and impacts given Finland's proximity to the many languages and cultures in Europe and the multiple language capacity of most Finnish citizens. The focus on the learner in projects such as IQ•FORM and consideration of the pedagogical benefit of mLearning is very encouraging and would be of interest to Canadian institutions and companies.

From the listing of Ed-Media presenters from Finland, there appears to be very little inter-institutional involvement in research with most authoring groups being from a single university. If there were other research collaborators named, they tended to be those from other European Union countries, a requirement of support from most European Union programmes. Possibly because of this, Finnish researchers appear very aware of European research and less aware of Canadian contributions to the field with the exception of groups that are building on the technologies and knowledge of Marlene Scardamalia and Carl Bereiter of OISE/University of Toronto. The FVU project is encouraging multi-institutional implementations and research collaborations and the Academy of Finland is also encouraging interdisciplinary research. As an indicator of the impact of the strategies that are implemented, the trends in co-authorship of papers accepted by future Ed-Media or other conferences could be tracked.

## 4. Facilitating Efficiencies and Multi-Institutional and Public-Private Research Collaborations

The Finnish Virtual University (FVU) consortium includes all 20 research and art universities in Finland as well as the defense academy. The community of practice that has been brought together for the FVU implementation projects can be leveraged to encourage and connect research in online learning and to speed up the dissemination of research results. There are a number of opportunities for the FVU consortium to create efficiencies in conducting research and development in online learning and to catalyze and support multi-institutional and public-private research collaborations. This section includes suggestions on how this might be accomplished based on an initial review of mandates and capabilities.

### *Use existing FVU implementation projects to spark new research in online learning*

The announcement of the FVU has resulted in great interest in online learning in Finland and there are many opportunities to offer the FVU implementation projects as test beds to study various aspects of the delivery of online learning. For implementation projects that do not have in place a research team or research component, a call for research partners could be issued on the FVU web site and through the FVU contact people at each university. The purpose of the call would be to encourage faculty and graduate students to focus on the research questions of interest and to match them with the implementation teams and test beds.

### *Connect FVU implementation projects and current research*

While there are many researchers and research groups in Finland studying online learning, their research and the FVU implementation projects are not formally connected with a few exceptions such as the IQ•Form and Feedback from Virtual Learning Environments projects. There is an opportunity to support the creation of a research community that is linked to FVU projects and activities. The formal linkage could help ensure that the projects are informed by research, increasingly research with Finnish implementations, and that the research questions arising from the projects are considered by leading researchers. Possibly, the Academy of Finland or another funding agency could be approached to sponsor a targeted program to catalyze research to study the FVU implementation projects.

### *Leveraging the newly created FVU networks for dissemination of research results*

Each of the FVU implementation projects links faculty and staff across a number of Finnish universities. For example, one project called KASVI links the eight faculties of education in Finland. This level of networking is unprecedented and faculty interviewed mentioned the immediate benefits realized, from bringing new ideas to their institutions to the creation of collaborations that will extend beyond virtual university areas. A number of projects have organized workshops and some of the workshops have attracted several hundred participants. These networks should be further leveraged for the dissemination of research results. Another important channel for dissemination is the network of FVU contact people in each university.

*Building out a national research network*

A proposal has been submitted to the Finnish Academy to fund a national doctoral program that will be managed by a national network of leading Finnish researchers. This would be a good foundational activity of a national research network. There would also be benefit in extending the network to include researchers conducting research on FVU projects and other implementations to increase knowledge exchange opportunities.

*Practical activities for the FVU Development Unit*

There are a number of practical activities the FVU Development Unit can undertake if a full-time person is recruited to manage the activities and additional funding was made available to support the participation of faculty at the Finnish institutions. Existing FVU staffing is not sufficient to undertake more activities and researchers in the FVU participating universities appear to be fully-subscribed. Suggestions for activities include:

- Creating and supporting a network of doctoral students that are choosing virtual learning/FVU as their thesis topic.

The national doctoral program will only reach and connect the work of a certain number of doctoral students and there is an opportunity to connect most of the recently initiated research in this area. The FVU through the web site can identify those masters and Ph.D. students that are conducting a thesis in the area and publish their contact information and a description of their research focus. The FVU could help support a meeting of these students at the Finnish annual conference in educational technology.

- Database of research paper abstracts/papers

In addition to a listing of research projects, the FVU Development Unit could also publish a database of abstracts and entire papers on the FVU web site that summarize research results.

- State-of-the-art report series

An annual or semi-annual state-of-the-art report can be commissioned to summarize advancements in research and findings, both by Finnish researchers and those from around the world.

- Report series on research methodologies

The FVU could facilitate research by supporting the development of a report series and commissioning background papers on methodologies used for research. Seminars on research and evaluation tools and methodologies could also be organized with Canadian experts such as Terry Anderson and Carl Cuneo invited to contribute their experience in this area.

### *International Strategic Alliances*

Finnish universities are fortunate in having opportunities to link with other EU countries in research and dissemination projects such as the European Commission Project called "Learningspace, Cross-boundary European Scenarios on Learning" that gathers together a cross-disciplinary core group of European researchers on learning for knowledge sharing activities. Given the work involved in entering into and implementing strategic alliances, the FVU Development Unit should focus on finalizing a few, targeted formal arrangements each year. These arrangements could include post-doctoral and faculty exchanges, cooperation in knowledge and tool exchange in areas such as learning object repositories, and faculty and expert visits. Further information could be posted to the FVU web site in other languages with projects encouraged to provide summaries and updates for posting. There is a current call for proposals in the area of virtual universities within the European Union that should be fully exploited.

For cooperation with Canada, obvious connections are with the Canadian Virtual University consortium, COHERE, and the SSHRC Initiative on the New Economy in addition to building on the FVU's existing linkage with the TeleLearning Network of Centres of Excellence (TL•NCE) and Industry Canada. For the TL•NCE, there may be opportunities in exploring joint dissemination activities with Finnish participants in the PROMETEUS EU project.

### *Recommendations for Canada*

From the work I conducted for this paper, I offer the following comments and suggestions for Industry Canada.

As I worked to summarize the research underway in Finland, I realized there are few if any complete overviews of the research in online learning conducted in Canada, or the results of this research. Some organizations, such as TL•NCE, published summaries of their findings in particular sectors but a comprehensive review would be useful. I am also not aware of documented "lessons learned" results from large investments such as the Alberta Learning Enhancement Envelop funding which had similar funding levels to the FVU investment.

As in Finland, Canadian research is not connected to implementation projects funded by organizations such as CANARIE with its substantial Learning Program. A call for research partners could be issued and targeted funding made available to encourage this linkage.

In Canada, with the SSHRC Initiative on the New Economy and the OLT research fund, there is promise for continued and new research funding. There is some but limited focus placed on disseminating research results, either within the set of projects they fund, to other research groups, or to practitioners in various sectors across Canada. There are many informative papers and research results that are read by only a handful of people or are not in a language accessible to most practitioners. In addition, the human network of researchers created by organizations such as EvNET and TL•NCE are built but are then abandoned or not supported at the end of the funding term. A role Industry Canada and/or CMEC might take, in cooperation with the granting councils, is on dissemination of research and experience in Canada and programs to encourage the two-way dissemination of results. There also is a gap in the transfer of know-how on an international basis. International

travel and collaboration are not frill activities and a targeted cooperative strategy among departments and organizations is needed to put Canada on the world map in this area.

## 5. Potential Collaborative Research and Knowledge Transfer Opportunities

During this project, opportunities were identified for the exchange of research knowledge and research collaborations between Finnish and Canadian organizations. These are summarized on the following page. These referrals are in addition to the existing collaborations between the OISE/UT CSILE/Knowledge Forum team and Erno Lehtinen of the University of Turku and the Centre for Research on Networked Learning and Knowledge Building at the University of Helsinki Arts and Design.

As follow-up, I have been invited to Finland in September and again in October to have more in-depth discussions with leading research groups. An invitation has been made for Terry Anderson of the University of Athabasca, to visit Finland to participate in a research workshop and to identify potential Finnish collaborators for a Canadian Virtual University grant proposal to the SSHRC Initiative on the New Economy program. Several other presenters have been invited to present and participate in the TL•NCE and CADE co-hosted conference, November 10<sup>th</sup> to 13<sup>th</sup> in Vancouver including Erno Lehtinen, Matti Sinko, and Janne Sariola.

An October visit by IBM Canada to discuss opportunities in learning object repository development and education portal deployment has also been proposed and organization of the meeting is underway.

**Table 2: Suggestions for Finnish-Canadian research collaborations**

<b>Area</b>	<b>Finnish Groups</b>	<b>Canadian Groups</b>
Learner support requirements and tools	IQ-Form, Prof. Hannele Niemi and lead researcher Raija Latva-Karjanmaa	Roger Mundell, Royal Roads University
Mobile Learning	Janne Sariola, mlearning Research Group, University of Helsinki;  Petra Wager, Product Manager, New Learning Solutions, Nokia	Julie Zilber, 7 <sup>th</sup> Floor Media  John Nesbitt, TechBC
Advanced placement courses in computer science to high school students/rural schools	Jaana Lukkarinen, Niko Myller, Jarkko Suhonen, Erkki Sutinen, Sirpa Torvinen; University of Joensuu	Ken Stevens, Memorial University
Virtual Labs	Jari Rinne, Rovaniemi Polytechnic	Samuel Pierre, Tele-universite; Roy Eagleson, Queen's
Feedback and Evaluation research	Marja Kallonen-Rönkkö, Head of Education Technology Centre, University of Joensuu	Terry Anderson, Athabasca University Carl Cuneo, McMaster University Tom Carey, COHERE consortium
Research Networks	Management and Coordination	Joanne Curry (TL•NCE) Carl Cuneo (EvNET)
Dissemination of Research Results	Prometeus project participants (Kari Mikkilä and Kari Salkunen)	TL•NCE Management Office
Learning object repositories, education portals	FVU Development Unit and Liisa Huovinen, Ministry of Education	Chuck Hamilton, IBM Pacific Development Centre
Lifelong Learning research program management	Life As Learning programme, Academy of Finland	Janet Halliwell, SSHRC's Initiative on the New Economy
eLearning Industry Cluster Development	Model and process for defining eLearning industry cluster: Kari Mikkilä, Finnish eLearning Cluster Development Programme, Human Capital Investment Oy	Nadia Lombardi and Yuri Dashko, Industry Canada IHAB; Rafiq Khan, CANARIE Inc.; Paul Cappon, Council of Ministers of Education

## 6. Conclusions

There are many innovative Finnish research groups conducting research in the area of online learning. The number of researchers focussed on this research topic will increase rapidly with the interest and test bed possibilities generated by the Finnish Virtual University project. A number of new funding sources, both in Finland as well as in Europe, will also help to encourage expansion of research efforts.

There is much potential for research collaborations between Finnish and Canadian organizations in the area of online learning. This report identified an initial set of collaborations that could be pursued. In addition to the specific knowledge exchanged, Canada would benefit from pursuing these collaborations. Despite its strengths in research in this area, Canadian expertise is not well known and Canada needs to increase its efforts to showcase Canada's expertise and research products. Working with Finnish partners will also provide a window to the extensive European Union developments and to EU collaborators and markets.

## Appendix A: Key Contact People for Sector Overviews

### *Individuals with Overall Public Sector Overviews of Developments and Research*

#### **Ministry of Education**

Liisa Huovinen ([Liisa.Huovinen@minedu.fi](mailto:Liisa.Huovinen@minedu.fi))

#### **Finnish Virtual University Development Unit**

Matti Sinko, Project Director ([matti.sinko@hut.fi](mailto:matti.sinko@hut.fi))

Kari Salkunen, Project Assistant ([kari.salkunen@hut.fi](mailto:kari.salkunen@hut.fi))

Julian Lindberg, Project Coordinator ([julian.lindberg@utu.fi](mailto:julian.lindberg@utu.fi))

#### **University of Helsinki**

Hannele Niemi, Professor, Department of Education (IQ-FORM Project)

([hannele.niemi@helsinki.fi](mailto:hannele.niemi@helsinki.fi))

Raija Latva-Karjanmaa, Researcher (IQ-FORM Project) ([raija.latva-karjanmaa@helsinki.fi](mailto:raija.latva-karjanmaa@helsinki.fi))

Mika-Erik Walls-Carpelan, Specialist in net-based & eLearning ([mika-erik.walls-carpelan@helsinki.fi](mailto:mika-erik.walls-carpelan@helsinki.fi))

#### **University of Oulu**

Juha Pohjonen, Campus Futurus ([juha.pohjonen@oulu.fi](mailto:juha.pohjonen@oulu.fi))

#### **University of Turku**

Erno Lehtinen, Faculty of Education ([erno.lehtinen@utu.fi](mailto:erno.lehtinen@utu.fi))

#### **University of Joensuu**

Marja Kallonen-Rönkkö, Head of Education Technology Centre ([marja.kallonen-ronkko@joensuu.fi](mailto:marja.kallonen-ronkko@joensuu.fi))

#### **Eastern Finland Virtual University Network**

Dr. Esko Kähkönen, Project Manager ([esko.kahkonen@joensuu.fi](mailto:esko.kahkonen@joensuu.fi))

### *Private Sector Overview*

Kari Mikkela, Executive Producer, Finnish eLearning Cluster Development Programme, Human Capital Investment Oy ([kari.mikkela@humcap.fi](mailto:kari.mikkela@humcap.fi))