

Fredrik Paulsson  
Umeå University/National Board for Education  
fredrik.paulsson@educ.umu.se

## The Virtual Workspace Environment

### *VWE for Learning - Tomorrows learning environment today?*

### Background

Teachers face many difficulties when working with ICT in education. Many of those problems are caused by the lack of conformity between the used technology and the pedagogical requirements.

Our basic intention is to combine advanced technology development and pedagogical development in order to adapt the technology to pedagogical ideas as well as the other way around.

VWE for Learning is developed as a Work Package within the European School-net (EUN) \*1\* Multimedia project.

### A short description

VWE for Learning is an attempt to remove some of the pedagogical constrains caused by technology. The VWE for Learning development is based on the assumption that an educational environment needs to be flexible and adaptable in terms of functionality, structure and complexity. - The teacher must be able to control the own tools and the technology must be adaptable to different learning situations!

By carrying out front-end technological development based on pedagogical theses a different kind of environment for distance- and flexible learning is created.

VWE takes the use of computers *from the desktop to the network* – everything you are able do on the desktop, you can also do on the network, with the added values of collaboration and time/place independence. The basic idea behind VWE for Learning is to enable for teachers and students to create and administrate his/her own learning environment in the shape of a *workspace*. All based on the requirements for a specific activity and learning situation. The teacher or a student may create a Workspace by choosing and combining the as desired functionality from the VWE tools available in the “*tool kit*”. IT all works a little bit like a LEGO™ building kit. The tools in a workspace may provide any kind of functionality, from a simple chat application to more advanced applications, as word processing, spreadsheet, simulation or videoconferencing, all depending on the specific requirements for a certain activity.

VWE for Learning consist of two parts – *VWE and VWE tools (for learning)*. The VWE part may be compared to the *operating system* in a desktop computing environment. It provides all the functionality provided by the OS on a desktop computer, such as file system, integration of applications (tools) etc. We have, however, added collaboration! *VWE is basically an operating system for the Internet!* The tools may be compared to the applications on a desktop computer. The tools are actually software components that provide the functionality to a workspace. When a user connects to a workspace a part of VWE called Kernel is downloaded to the client (for example the web browser). The Kernel handles all the communication between the client, VWE and VWE tools during a session. A tool is downloaded to the client in run-time when the user needs it.

VWE supports features like multilinguality, change of the conceptual world for the system, different look and feel etc, all in order to enhance the flexibility and the adaptability of the environment.

## Technical architecture

The VWE architecture is 100% based on Java \*2\*. VWE makes extensive use of RMI and CORBA \*3\* and is in some parts based on the use of the Jini technology \*6\*, which makes it self-configurable. VWE runs as a distributed system and may be run, distributed on any number of servers, situated anywhere on the Internet or Intranet. The implementation is based on Open standards \*4\* in order to enhance interoperability and flexibility. All data in the system is handled using XML \*5\*. The VWE runs under the Java 2 environment, which makes it platform independent and there is no need for any additional installations on the client. This makes it possible to run VWE in the web browser, or any other client that supports Java, such as a thin client, a mobile phone, your palm computer or even your refrigerator!

VWE is most suitable for use with broadband connections<sup>1</sup>, but may as well be used with lower bandwidth connections. The performance is much depending on the chosen tools. Most networked Java application can be adapted and integrated with the VWE via a simple API.

VWE for Learning also make use of standards for delivering movable and component based courses and learning material through the IMS standard \*7\*. Other similar standards \*8\* will also be supported in the future.

## Current status

A first alpha-version of VWE for Learning was finalized in November 1999. Version 1.0 of VWE for Learning will be released and freely distributed under an open source license in October-2000. VWE for Learning will also be distributed as a part of the European School-net and it will be made available to all European Schools from the EUN server. The freely available VWE for Learning package will contain VWE and some basic tools for collaboration, communication and learning.

## References

### Web

- (1) European School-net <http://www.eun.org>
- (2) JavaSoft <http://www.javasoft.com/>
- (3) Object Management Group (OMG) <http://www.javasoft.com/>
- (5) World Wide Web Consortium (W3C) – XML <http://www.w3.org/XML/>
- (6) Jini.org <http://www.jini.org/>
- (4) IEEE <http://www.ieee.org/>
- (8) IEEE Learning Technology Standards Committee (LTSC) <http://grouper.ieee.org/groups/ltsc/>
- (7) Instructional Management System (IMS) <http://www.imsproject.com/>

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<sup>1</sup> Using the definition of broad band as a minimum of 2Mb