

# The role of Virtual Research Environments (VRE's) within the context of an e-Research framework

Dr Heila Pienaar (UP)  
Dr Martie van Deventer (CSIR)



<http://www.toyemporium.com.au/shop.p58>

The e-Research framework for South Africa developed by Fernihough (2011), after in depth interviews with various SA research stakeholders, will be discussed in order to give a framework or context for the role of virtual research environments with regard to e-Research.

The theoretical background of VRE's will be described with reference to developments in the UK, USA, Australia and South Africa. Special attention will be given to the VRE conceptual framework that was developed in South Africa.



# Content

- ◉ e-Research
- ◉ e-Research framework
- ◉ Virtual Research Environments (VRE's)
- ◉ VRE framework
- ◉ International & SA examples of VRE's
- ◉ Getting to the practice ...



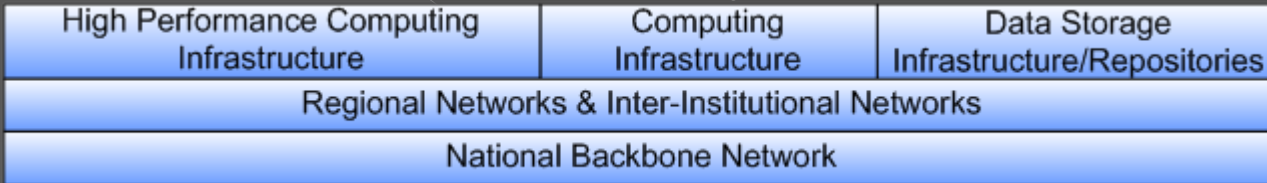
# e-Research



- large scale science, humanities & social science research, that is increasingly being carried out through distributed, global **collaborations**, enabled by the **Internet and related technologies** ...
- e-Research is a new way of doing research, **collaborating** globally and nationally while making use of **ICT infrastructure** to do research. (Fernihough 2011)

# SA e-Research framework

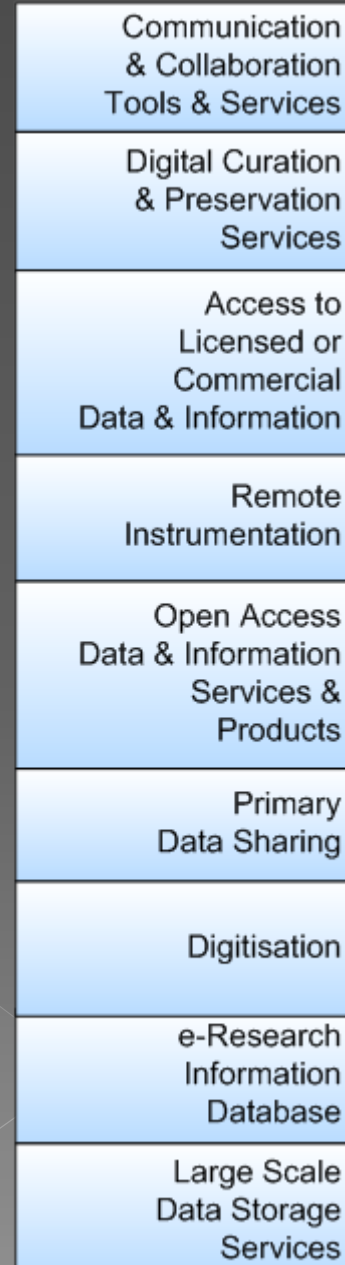
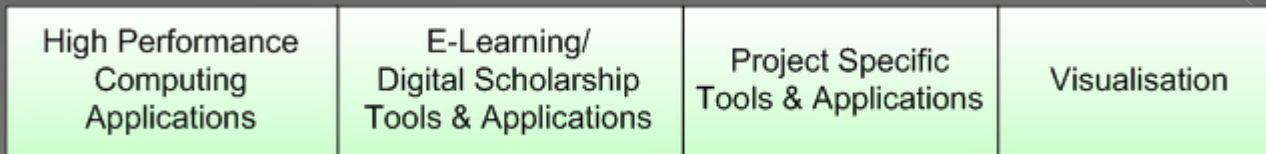
## e-Research Infrastructure or "cyber infrastructure"



## e-Research Middleware and Services



## e-Research Applications



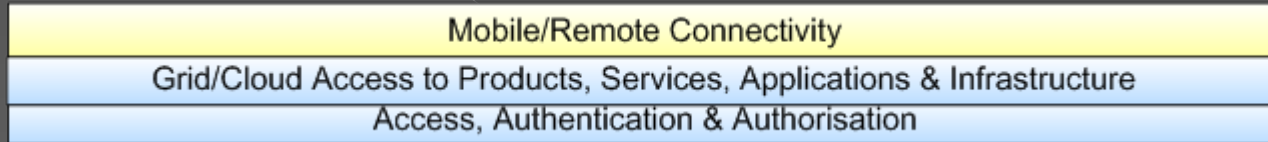
## e-Research Products and Services



# SA e-Research framework



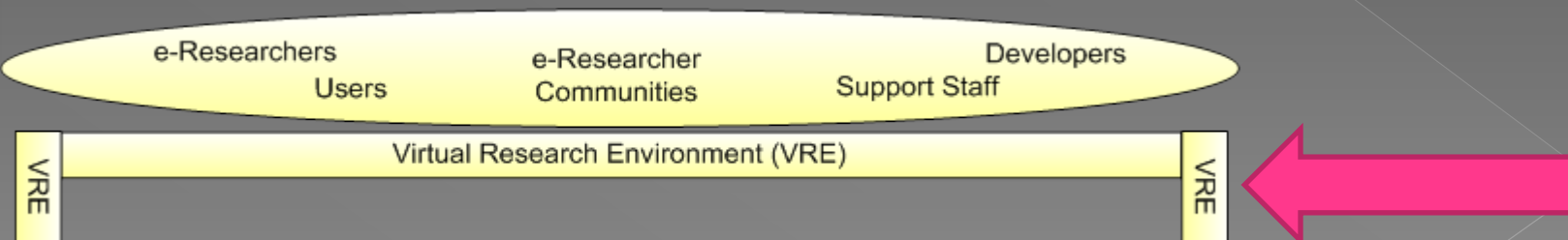
## Access Modules for e-Research



## User Training, Skills Development & Quality Assurance Components



## Users and the Virtual Research Environment for e-Research



# SA e-Research framework



## Committee and Management Team for e-Research

Multi-disciplinary Strategic Oversight & Leadership Committee

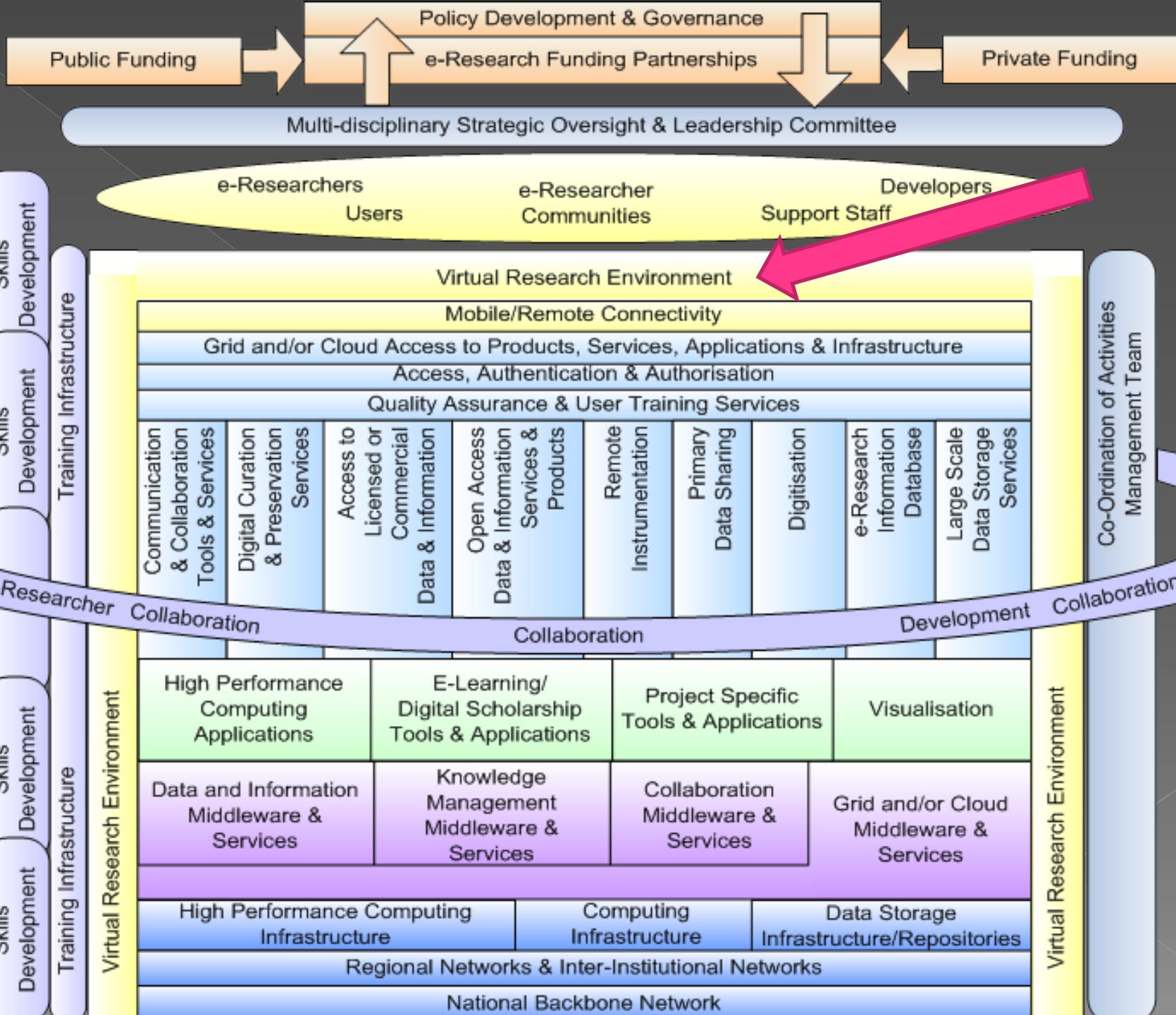
Co-Ordination of Activities Management Team

## Collaboration in e-Research Activities



## Funding of e-Research Components







# Virtual Research Environments (VRE's)



- Can be seen as the IT infrastructure (hardware & software) that supports & enables all the steps in the **Research Process** in an integrated manner
- Librarians can play a pivotal role in the development, implementation and facilitation of a Virtual Research Environment
- The core element of the e-Research framework
- Many international projects & initiatives
- Also 2 South African initiatives

# South African Malaria VRE framework

**Repositories:**  
research results;  
experiments;  
literature &  
documents

**Web/wiki/blog:** search engines, databases;  
researchers & topics; funders, portals,  
communication, projects

Identification of  
research area

Literature review &  
indexing

Internal shared  
database of  
indexed articles

Dissemination &  
artifacts

Real time  
communication

Training / mentoring

Scientific workflow



Identification of  
collaborators

Proposal writing

Identification of  
funding sources

Project management

Document  
management  
system

Generic  
software e.g.  
MS / Open  
Office

Project  
management  
system

(Free) Data  
analysis  
software

Skype, smart  
board, video  
conferences

E-learning  
system for  
researchers

(Collaborative)  
Electronic Lab  
book

Integrated  
data  
management  
system

Servers with  
data files

Sophisticated  
instruments that  
generate digital  
information and data

Mathematical modelling tools;  
numerical algorithm tools; simulation  
software; in silico experiments

Access to  
research  
networks &  
super  
computers;  
access to labs  
with in silico  
screening

# International VRE examples

The screenshot shows the OpenWetWare homepage. At the top, there's a navigation bar with 'article', 'talk', 'view source', and 'history'. Below that is a large 'OPENWETWARE' logo with a DNA double helix. A main text block describes the site as an effort to promote the sharing of information, know-how, and wisdom among researchers and groups working in biology, biological engineering, and related fields. It includes a 'Lab & Groups' section with a 'From around the world' tag, a 'Courses' section, and a 'Protocols' section. There's also a 'Blogs' section and an 'OWW News' section.

**OPENWETWARE: Lab Notebook on Blog**

The screenshot shows the 'British Library for Research' website. It features a header with the library's name and a tagline: 'A one stop solution for carrying out research studies in planned & phased manner and networking with fellow community members'. There are sections for 'Plan The Research', 'Terms of Use', and 'Privacy Policy'. A login section is visible with fields for 'I have read and agree to the terms of use and privacy statement', 'Forgot your username or password?', and 'Trouble signing in?'. There are also links for 'New to RIC?' and 'Register'.

**BL / MS RIC: Management of published info**

The screenshot shows the ResearchGate website. It has a header with 'Home', 'Demo Tour', 'Sign Up', and 'Vision'. A 'Login' section is prominent with fields for 'Email' and 'Password'. Below the login section, there's a 'Welcome to ResearchGate' message and a list of features: 'present yourself and your research projects', 'enroll, expand, and broaden your science network globally', 'exchange know-how and expertise', 'initiate collaboration', 'discuss your research limitation and get positive feedback', and 'use our innovative tools and work environments for online collaboration'.

**ResearchGate: research collaboration**

The screenshot shows the 'Lab Notebook' page on OpenWetWare. It includes a 'Log in / create account' link. The main text asks if the user is interested in setting up a lab notebook. A 'Features' section lists: 'Dynamic calendar', 'Local search', 'Improved navigation', and 'Customizable entry pages'. There's a 'Set up your own lab notebook' section with a 'One-click Lab Notebook Setup' button and a 'View the screenshot of how to set up your notebook' link. Further instructions regarding notebook setup are provided at the bottom.



The screenshot shows the myExperiment website. It features a header with 'my experiment beta' and a tagline: 'myExperiment makes it really easy to find, use and share scientific workflows and other files, and to build communities'. There's a search bar and buttons for 'Explore' and 'Register'. Below that, there are links for 'Find Workflows', 'Find Files', and 'Share Your Workflows and Files'. A 'Taverna Workflow Workbench' and 'myExperiment Publications' are also mentioned.

**myexperiment: scientific workflows**

The screenshot shows the 'archer e-Research Toolkit' website. It has a header with 'about archer', 'e-research toolkit', 'online demos', 'downloads', and 'contacts'. The main content area is titled 'eResearch Toolset Overview' and describes the toolkit as a community-driven project. There are sections for 'About ARCHER' and 'Downloads & Documentation'.

**archer e-Research toolkit: data management**

The screenshot shows the nanoHUB website. It features a header with 'HOME', 'Resources', 'Members', 'Events', 'About', and 'Support'. The main content area is titled 'nanoHUB' and describes it as a platform for creating dynamic web sites that connect scientific communities. It mentions 'GLOBAL HUB', 'IndianaCTSI', and 'Video Overview'. There are also links for 'materials' and 'your Hub'.

**HUBzero: access to interactive simulation tools**

The screenshot shows the nanoHUB.org website. It has a header with 'nanoHUB.org' and 'ONLINE SIMULATION AND MORE'. There's a search bar and buttons for 'Login' and 'Register'. The main content area is titled 'SIMULATE' and 'FEATURED TOOL'. It lists 'OMEN Nanowire: Full-band 3D quantum transport simulation in nanowire structure' and 'SPMW The Nanomechanics of compositional atomic force microscopy (AM-AFM) has been very successful for'. There are also sections for 'RESEARCH', 'TEACH & LEARN', 'CONTRIBUTE', and 'NANO NETWORKS'.

**nanoHUB: subject gateway built on HUBzero platform**

# South African VRE example: Demonstrator of a VRE for SA Malaria researchers



The screenshot shows a web browser window displaying the SAMi VRE interface. The browser address bar shows the URL <http://137.215.75.229/vre/index.php>. The page features a navigation menu on the left with options like 'Administration Menu', 'View Account', 'Edit Account', 'Notifications', 'Inbox', and 'Logout'. The main content area is divided into sections: 'Progress Date' (Due dates for progress reports due 30 September), 'Upcoming Events' (Laa di laa), and 'Welcome' (The South African Malaria Initiative (SAMi) is a partnership established to facilitate the integration of malaria research and capacity development in South Africa and the rest of Africa. The aim is to stimulate the use of modern molecular research tools to improve malaria prevention and control. The South African Malaria Initiative will facilitate an integrated programme of malaria research and capacity development in South Africa and the rest of Africa to improve malaria prevention and control. Modern research tools will include the identification and validation of drug and insecticidal targets, development of drug and insecticidal candidates, improved diagnostics, and new tools for gathering epidemiological information.). A right-hand sidebar contains a 'Private Space' section with a list of names (Bridgette, Linda, Martie, Zoleka) and various tool links like 'Tools for data mining', 'Tools from NCBI', and 'Shared Resources'. At the bottom, there is a section for 'Latest publications on malaria' with links to Google Scholar and Malaria Journal.

**Annotations:**

- Personal space:** A red box pointing to the 'Upcoming Events' section.
- Authorisation through application:** A red box pointing to the 'Welcome' section.
- Shared space:** A red box pointing to the 'Welcome' section.
- Commercial Resources via Library:** A green box pointing to the 'Library Commercial Resources UP' and 'Library Commercial Resources CSIR' links in the left sidebar.
- Blogger:** A green box pointing to the 'Private Space' section.
- Wiki:** A green box pointing to the 'Shared Resources' section.
- DSpace:** A green box pointing to the 'Shared Resources' section.
- WebCoLab:** A green box pointing to the 'Shared Resources' section.
- MSM/Google Groups:** A green box pointing to the 'Project Management' section.

# South African VRE example: Using an African LMS **Chisimba** for Southern African 'Natural Products' research



Virtual Research Environment

Find



Researchers of natural products enhancing food security and improving health!

Login

Username:

Password:

Remember me

Login

[Forgot your password?](#)  
[HELP](#)

Registration

[Register](#)

## WELCOME TO THE CHISIMBA VIRTUAL RESEARCH ENVIRONMENT

This digital workspace is home to a number of researchers concerned with the utilisation of African natural products - to enhance food security and improve human and animal health.

[SABINA](#) is a network that constitutes the following partners: [University of Malawi](#), [University of Namibia](#), [University of Dar es Salaam](#), [University of Pretoria](#), [University of Witwatersrand](#), [Council for Scientific and Industrial Research](#) and [Tea Research Foundation of Central Africa](#). SABINA partnership is focused on the building of capacity in natural product research through training of MSc and PhD students. The main goal of SABINA network initiative is to implement proactive postgraduate programmes in chemistry/biochemistry of natural products. This project is funded as a Carnegie Regional Initiative in Science and Education (see <http://sites.ias.edu/sig/rise/>). The SABINA programme as supported through Carnegie-RISE focuses on the development of biological resources with application in medicine, health promotion, and agriculture.

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#### [Science-policy relations](#)

# South African VRE example: Using the open source LMS Moodle for Southern African 'Natural Products' research



Pol-SABINA Virtual Research Environment

You are not logged in. (Login)



Pol-SABINA VRE: Researchers investigating natural products to improve lives!

### Login

Username

Password

[Create new account](#)  
[Lost password?](#)

This digital workspace is home to a number of researchers concerned with the utilisation of African natural products - to enhance food security and improve human and animal health.

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**LATEST NEWS**  
on science, technology & the developing world.

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29 March 2012 | Source: SciDev.Net

**Science-policy relations 'stuck in outdated era'**  
A leading sociologist has said that old science policy

# Positive client reactions w.r.t. **Moodle**

- ◉ Looks MUCH better—well done
- ◉ Having fun using the new VRE facility! It's handy and easy at least for now. Good job Martie et al.
- ◉ Easier and faster to use
- ◉ Enjoys the blog function



Also investigating LMS Sakai to use as a possible VRE?

Facilitating a VRE to follow ...



# References

- Fernihough, S., *e-Research (An Implementation Framework for South African Organisations)*. 4th African Conference for Digital Scholarship and Digital Curation, Pretoria: 16 May 2011.  
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<http://www.nedicc.ac.za/Conference/Upload%20Papaers/204%20Natural%20products%20VRE%20V2x.pdf>