APPENDIX FIVE
Scan of ICT Use in South African Education

This scan summarizes some uses of information and communication technologies in South African educational institutions or projects.[1] Most of the information contained in this appendix has been based on case study descriptions compiled from information gathered during a series of interviews held in early 1998. Additional descriptions have been added, based on subsequent SAIDE research. As these descriptions have been gathered over a two year period, not all of the summaries reflect the current state of project development.[2] Nevertheless, they offer a snapshot of the types of ICT use that has been emerging in South Africa during this period. The appendix has been used as background information for chapter four of this report, in which we extrapolate lessons on technology use in South Africa. Even though not all of these case studies are current, the lessons evident in them still have value.

The following table presents a list of the projects or institutions described, indicating the type of technology for each initiative

Institution/Project	Focus
Africa Growth Network	Technology provider: video conferencing, multimedia computer platforms
Cape Technikon	IT course for teachers
Cyberschool Africa	Web content for schools
Lenasia Teachers' Centre District C1	Resource centre and IT training
National Educational Technology (Netech)	Provider of a range of satellite technologies for education
Ort-Leap Trust	ABET course using videocassette (previously video broadcast)
Pineland's High School	E-mail and Internet use in teaching Computer Studies to students not at the school.
Rivonia Primary School	Computer centre for CD-ROM, Internet and standard application use
Shoma Foundation	Satellite television broadcast and computer use for teachers
Spacenet	Educational technology provider
Stellenbosch University	Video conferencing
St Alban's College	Technology centre, curriculum-based Internet project and Adopt-a-network

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[1] The detailed case studies can be accessed at http://www.saide.org.za/multi/m-homepage.htm. They were based on a series of interviews held with people directly involved with the projects. In some cases, information about projects was obtained from a project web site. In many instances, the person interviewed was involved in more than one project of interest. When this occurred, a separate description for each project was compiled. Transcripts of case studies were, wherever possible, sent via e-mail to the person interviewed, to give people an opportunity to ensure that the information is accurate.

[2] More current information on South African ICT use will be available on the SchoolNet website in the near future. The Millenium Mind conference held in Cape Town (28/9/1999-1/10/1999) was the most recent conference in which people involved in the use of ICTs (particularly in the schooling sector) presented on their initiatives and work. A CD-ROM of conference presentations is due to be made available. This will give more current reflection on many of the initiatives presented in this appendix.

Institution/Project	Focus
St John's College	School computer infrastructure and use
St Stithian's College, Preparatory School, and Collegiate	School computer infrastructure and use
Technikon Natal	Use of the Open Learning Centre for CAL and Internet use
Ulwazi Computer Solutions	Computer service and supply company
Universal Service Agency	Increase telecommunications access to the public
University of Cape Town	
Mathematics and Applied Mathematics Department	Online courses
Multimedia Education Group	CD-ROM and web-based course support
University of Natal (Durban)	
Biology Department	Research on multimedia and software for education, through courses offered.
Department of Nursing	Resource-based learning course using nursing equipment, videocassettes, multimedia programmes
Computer Services Division	Multimedia educational materials for various departments, video conferencing
University of Pretoria	
Department of Education	
Cronje	Masters degree in Computer-Aided Learning, offered primarily via the Internet
de Kock	Teacher training using 'interactive television technology"
Hodgkinson	Masters degree in Computer-Aided Learning focusing on adult education and training
Department of Information Technology, Networks and User Support	Technical IT support and training for University staff
Telematic Education Unit	Use of video conferencing
Brown	Support for University staff to integrate technology use into their courses
Freysen	Video production and broadcasting
University of South Africa (UNISA)	
Computer Science Department	Computer science course
Students Online	Internet-based general student support service
University of the Western Cape	
Western Cape Education Department	Internet-based school biology curriculum project and multimedia materials for the Botany department
Cape Town Teachers' Centre	Teacher training in the use of technologies, advise on IT at schools, and Internet-based collaborative project
Education Technology Unit	Supports information technology use in schools, produces video and audiocassette resources
Parow Teachers' Centre	Teacher training in the use of technologies and advice on establishing IT at schools,
Western Cape Schools' Network	Internet service provision for schools
Winchester Ridge Primary School	School computer infrastructure and use
Wits P&DM course	Masters in management using Picturetel video conferencing for students in Mpumalanga

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AFRICA GROWTH NETWORK[3]

Contact Name: Kobus Kruger
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Africa Growth Network (Pty) Ltd (AGN) is now called Global Access. It is a technology-based organization offering customized business communication, training, and education solutions to corporates, parastatals, government, and educational institutions. It applies a variety of media, ranging from satellite -encoded transmissions and video-conferencing to multimedia computer platforms, incorporating leading edge software to solve the communication and learning challenges facing the South African business and tertiary education environment. The organization is involved in a number of different distance education projects. Its involvement with Power Matric, the University of Potchefstroom Masters in Business Administration and Bachelors in Business Administration, and the Gradua te School of Business Leadership at the University of South Africa (UNISA) is described below.

CAPE TECHNIKON

Name: Chris Lombard
Contact Number: 021 460 3388
Email: chris@hyper.ctech.ac.za
Project: Technology for Education Course

Cape Technikon constructed an Information Technology Course for teachers, which will be run on Saturday mornings. It is not yet operational, as funding is still required. The course has been designed in partnership with Goolam Mohammed from the Cape Town Teacher Centre (CTTC). The Technikon aims to adopt an integrated approach to use of technologies in the classroom. Theoretical aspects of the course will cover one semester. In the following semester, class-based activities in use of the technologies in schools will be undertaken and reports delivered. Selection of candidates will be administered by the CTTC. Links will be established between successful completion of the course and distribution of equipment to schools, which is currently being coordinated by the Western Cape Schools Network and the CTTC. In other words, if a teacher has successfully completed the course, his or her school is given preferential status in the donation of equipment. In certain cases, some equipment will be supplied to the school before a teacher completes the course, in order to allow enrolled teachers to complete practical activities with their classes. The course will not be accredited, but will be certified.

CYBERSCHOOL AFRICA

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Email: alison@cyberschool.co.za
URL: http://www.cyberschool.co.za

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[3] Africa Growth Network no longer exists, but has changed to Global Access.

Cyberschool Africa uses the Internet for content and communication. The organization makes matriculation tutorial material available on the Internet, marking up to HTML the notes and questions of teachers on matriculation subjects. There are also multiple choice questions, which have an automatic response system, located on Cyberschool's site. Similarly, the site contains links to other educational sites, news, and events. The site is free to learners, being funded by sponsorship and advertising. Cyberschool has also established chat lines, key-pal listings and runs a question-and-answer service for matriculation students. In 1997, there were approximately 3000 users per month, about half of whom were from the United States of America. Cyberschool is currently investigating the education potentials of competitions such as ThinkQuest, as well as the full interactivity and communication possibilities of the Internet for students and teachers. Consequently, the production of content-driven revision material is on hold.

LENASIA TEACHERS' CENTRE DISTRICT C1 [4]

Name: Dave Naden
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The Lenasia Teachers' Centre is an excellent example of a sustainable information technology centre. It has the infrastructure necessary to support schools in the region with technical skills and a variety of services: printing, bookbinding, video cassette, book and multimedia loans, photographic development and slide processing, colour transparencies, and video capture. In addition to these services (most of which are free to schools), the centre offers courses in information technology skills - including repairs, upgrades and maintenance - to the community for a nominal fee (usually R10 an hour). There are also e-mail and Internet facilities - Dave wants to learn FrontPage and HTML coding so that he can create a web site and teach a course on web authoring. The centre is a hive of activity and an excellent example of what is possible within a tight budget. The Bridges Community Network has given six schools in the C1 district a free e-mail service.

NATIONAL EDUCATIONAL TECHNOLOGY (NETECH) [5]

Name: Hantie Coetzee
Contact Number: 012 349 1920 / 082 447 9640
E-mail: netech@lin01.global.co.za

Netech offers a range of distance education satellite technologies and a menu of courses for training. Its focus is on a modular interactive distance learning system, which connects a studio with a specially equipped classroom. Keypads and telephones allow for student responses to the studio.

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[4] In addition to an interview, information in this report is taken from:
- *Flyers advertising the courses* available at the Centre;
- Teachers' Centre District C1, Last Quarter, December 1997, *News*.
- Teachers' Centre District C1, *Multi Media Kit Catalogue*, Date of issue: 1997/11/27.

[5] This case study description has been compiled from internal documentation and was not based on an interview.

ORT LEAP TRUST

Name: Iris Colyn
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Email: iris@icon.ac.za

Ort-leap offers an ABET programme. Ort-Leap expects approximately 12 000 learners from industry and unemployed to be part of their programme for 1998. The course is made up of printed course material, interactive video, and a facilitator for each remote site. The ABET content is handled thematically, but examined in learning areas. Ort-Leap aims to use an integrated problem-solving approach with the process of design-make-and-evaluate running throughout. The organization has recently changed from live broadcasting to interactive video and now expects its facilitators to attend an accredited facilitation course. SAIDE collected documentation on other Ort-Leap projects and visit the Integrated Learning Technologies Park (ILTP). Ort-Leap is a associated with Spacenet (see separate report).

PINELANDS HIGH SCHOOL

Name: Mike Junor and Pam Miller
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Email: pam@miller.wcape.school.za
URL: http://www.wcape.za.subject/CS/PHS/98-11-1.htm,
                                               http://www.wcape.za.subject/CS/PHS/98-11-t.htm and
                                               http://www.wcape.school.za/phs/

Pinelands high school has a computer laboratory that is used primarily for the teaching of Computer Studies. The new standard grade Computer Science Syllabus is being taught in grades ten and eleven. Pam Miller teaches the subject and was approached by a few students from other schools who do not have Computer Science offered as a subject at their schools, but all of whom have computers and Internet at their homes. Consequently, Pam has included five students who are not from Pinelands in her grade eleven class. She has included them in the groups of four that she has established in her class. The distance students communicate with their group and with Pam using telephones and e-mail. Pam has found that telephonic contact is necessary before e-mail collaboration can take place. The distance students e-mail files of information that they get off the Internet to their group, whereas the Pinelands groups use books and other sources for their information. All the lessons and tasks she has set can be viewed at http://www.wcape.school.za.subject/CS/PHS/98-11-1.htm[6]. Much of the information in this report has been taken from this web site.

RIVONIA PRIMARY SCHOOL

Name: Brent Hutchinson
Contact number: 011 803 1649
Email: brent@rivonia.jhb.school.za

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[6] http://www.wcape.school.za.subject/CS/PHS/98-11-1.htm Pinelands High School Computer Studies SG 1998 - Grade 11: *A* pilot project in teaching via the Internet: Rationale *behind the project, ew-student, etc.* The page is maintained by Pam Miller and was last updated on 30/01/98, when referenced for this document

URL: http://www.rivonia.jhb.school.za

Rivonia Primary School has a computer centre with 36 networked Pentium computers and a dedicated diginet line, giving an Internet connection. The computer centre is networked to two computers in the staff room, eight in the administrative section of the school and four in the library. Students use office application software for their work, CD-ROMs are accessed using the computers, and the computers are used for remedial work and research. The Internet is used mainly for research purposes. Class teachers book time and set a lesson on a web site or ask stude nts to research a topic. CD-ROMs are used for research (as an encyclopaedia or as a source of information), for interactive stories and for remedial work (for example 2nd language English). Brent is employed on a full-time basis to run the centre. He is a teacher and is knowledgeable about technical aspects of computers.

SCHOOLNET SA

Name: Stephen Marquard
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URL: http://www.wcape.school.za

SchoolNet SA is a coordinating agency for the schools' networks. It concentrates on aspects of schools networking that cannot be handled regionally. It has three primary focuses: Connectivity (Stephen Marquard), Human Resources and Development (Dennis Brandjes) and Content and Curriculum (Ron Beyers). It will eventually be established as a section 21 company, but currently has an Executive Council that has been nominated during planning sessions. Planning meetings began in January 1997, and aimed to be as inclusive of interested parties as possible. They included representatives from the Government Departments of Education, Arts, Culture Science and Technology, and Commerce. SchoolNet SA was officially launched in December 1997. Some of the things it will do include:
- Public relations and marketing;
- Policy development and lobbying;
- Liasing with the National Government Departments;
- Fund-raising for and facilitating resource; and
- Content development and providing support services.

SHOMA EDUCATION FOUNDATION

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Shoma Education Foundation has run a pilot project in the training of Foundation phase teachers in Outcomes Based Education at sites in three provinces: Shoshanguve in Gauteng, Nqutu in Kwazulu Natal and Mitchell's Plain in the Western Cape. A video programme is broadcast via satellite television and watched by teachers at the three learning sites. A web site is also downloaded onto a computer network se rver and is used to reinforce concepts introduced in the video. Finally, teachers discuss what has been presented in a face-to-face

facilitated session. The pilot project will be continuing in 1999 and is looking to expand to more sites.[7]

SPACENET

Name: Ronnie Phillips
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Spacenet aims to be an educational technology provider - in all technologies. Its focus is on providing a satellite link between a studio and a remote classroom. In the studio, an expert is filmed, is able to show a visual display, and can see when students log in to 'class'. In the classroom, learners have a telephone keypad through which they can log in, log questions, and respond to polls. Students watch the broadcast (or recording) on a video monitor. This is about to be used for a training course by Alpha cement. Print material is available as support and is referred to throughout the broadcast. There will be nineteen learners at each learning centre, and one facilitator for each of the five centres. Much of the information presented here is based on a Spacenet internal document entitled: *Spacenet Information Guide.* Spacenet is associated with the Ort-Leap Trust.

STELLENBOSCH UNIVERSITY[8]

According to Helmie Driejer at the University of Stellenbosch, the institution 'does not make use of PictureTel for any application.... *yet.*'[9] The institution does, however, make use of satellite technology to transmit content to ten remote campuses. This is described as part of the institution's distance education strategy.

The institution reports that it is 'experimenting with video conferencing between tertiary institutions in the Western Cape using a newly installed 2Mbps frame relay network for the Adamastor Trust in the Western Cape.'[10]

It is reported that the intention and vision is to share classroom content between institutions. The emphasis on technology in light of an institutional distance education strategy is significant, in that it appears to be design of technology within a broader framework. One part of this process, are initiatives [which] are in line with a longer term vision for making multi-media courseware available on the Internet.'[11] At present, the universities of Stellenbosch, Pretoria and Potchefstroom are currently evaluating various platforms for making available multi-media educational content on the Internet.

The institution appears to have considered a range of technology options in light of a broader educational strategy and mixed delivery model. Similarly, a focus on supporting resource-

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[7]See SAIDE (19 October 1998), *The Shoma Education Foundation in Soshanguve: Evaluation of a Pilot Project run in July, August and September 1998,*

[8] Extract from: Jackson, C-A. (1998). Appendix One: An Educational Perspective on the use of Conferencing Technologies. In SAIDE. (1998*). Evaluation of the Distance Learning Practices of Wits' P&DM Mpumalanga Masters in Management Programme.* Johannesburg: SAIDE.

[9]Dreijer, H. E-mail correspondence, dated 28 September 1998. [*Emphasis added*].

[10] Dreijer, H. *op cit.*

[11] Dreijer, H. *op cit.*

based learning appears to underlie some of these decision-making processes. This cannot however, be accepted without further investigation and discussion with the institution, but in general, there is some indication that the institution is relying on educational principles and frameworks to inform its development and implementation of mixed media courseware.

ST ALBAN'S COLLEGE

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NOTE: Ron Beyers is involved in a number of different projects: Statec - The St Alban's Technology Centre, Project TECSAS - a grade nine electronic Biology text book and Adopt-a-Network. Each project has been documented separately.

St Alban's College has a very well equipped technology centre. There are four different teaching areas: two with 50 networked computers each; one with multimedia equipment (visual camera, CD-ROM, VCR, Satellite, laser disk and a data projector); and a small teaching room. Of the computers, 28 have direct Internet access. Bookings to use the facilities are made by the subject teacher. The computer laboratories are used for basic applications packages, Internet research, HTML mark up, and Computer Science as a subject. Between R500 000 and 600 000 is spent on the centre per year (excluding salaries). There are four permanent staff members for the centre.

Ron is also involved in Project TECSAS, which is a curriculum Internet-based project. The Grade 9 Independent Examination Board (IEB) biology syllabus has had web-based material developed for it. It has animations, graphics, content notes, and links to related sights. This has been developed over a period of two to three years at an estimated cost of R280 000. Its interactivity is in the form of multiple choice questions, which provide immediate responses, and e-mail contact with the writer.

The College has also been a part of Adopt-a-Network, which has also involved the Mamelodi teacher centre. This project was run in conjunction with the Council for Scientific and Industrial Research (CSIR) and Reach and Teach. As part of the project, a self-sustaining telecentre has been established and approximately 800 teachers have been trained in basic IT skills during voluntary, but accredited, holiday courses. Some 'South African content' initiatives are also being negotiated through the school.

ST JOHN'S COLLEGE

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URL: http://stjohnnt.stjohns.wits.ac.za

St John's College has a fibre-optic backbone with servers in the high school and preparatory school. They have an eight-tower CD-ROM stack, which can be accessed from the library.

The preparatory and high schools both have computer laboratories and computers in the library. Standard Six students complete an hour a week of computer basics, while, in later standards, subject teachers book time in the computer laboratories. The Internet is used for browsing and e-mail, and between ten and twenty percent of staff members use it. An example of usage is the science teacher (Ms Cuthbert), who belongs to various listservs and distributes worthwhile information to staff and pupils. Work, based on worthwhile sites, is also set for students and is supported with worksheets. Sometimes questions are set, the answers to which can be found on three or four web sites. CD-ROMs are used for demonstrating concepts that can be clearly shown, with worksheets being set on the content. CD-ROMs are used because they are more robust, stable, and faster than the Internet. Ms Cuthbert has prepared some web-based material that has notes, worksheets, experiments, and links to other sites, but it has not been posted to the Worldwide Web yet. There is no staff member for technical or IT support.

ST STITHIAN'S COLLEGE, PREPARATORY SCHOOL AND COLLEGIATE

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Patrick is the systems manager for all four schools at St Stithian's College. Each school has a pupil computer centre and each school's library has a number of computers. From Grade four to Post Matric, every learner has a password that gives them e-mail and Web access. The College is currently implementing a plan to ensure that all grade ten students have their own laptop computers. These are individual purchases from the identified supplier (at R12 000 to 13 000 each). In addition, staff can buy their own laptop computer as part of a scheme subsidized significantly by the school. It is estimated that ninety percent of computer use is in standard office applications and not use of educational software, Internet, or CD-ROM. Nevertheless, there is a lot of Internet traffic. The Geography department is publishing students' work on an Intranet and is involved in collaborative projects. There is no separate IT period, but subject or class teachers book laboratory time. Patrick is employed full-time as the systems manager.

TECHNIKON NATAL

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Marí is the centre coordinator for the Open Learning Centre at Natal Technikon. The centre has a computer laboratory for student use with 38 DOS-based computers and a training room with sixteen multimedia computers. The computer laboratory is used primarily to provide access to Computer-Aided Learning (CAL) software, which is used to reinforce what is done in face-to-face sessions. It is most commonly used by mathematics and science lecturers, who book the laboratory for their students to work on the Plato system. The lecturer is present

during these sessions, and work done in the laboratory forms part of course assessment. Multimedia software or CD-ROMs are used in the training room. The open learning centre is also involved in the production of multimedia resource materials to support academic courses. To date, Marí has worked on a web-authoring component of an electrical engineering course and a virtual classroom for the computer science department. As part of ongoing research, Marí has documented and presented information about the centre at various conferences. Information about the centre and its work is available at http://www.ntech.ac.za/acsupport/olc/calcentre.html. Much of the information recorded here is based on the Open Learning Centre's Progress Report for the first semester of 1998. [12]

ULWAZI COMPUTER SOLUTIONS (PTY) LTD

Name: Nic Thorburn and Ntari Jan Mosomane
Contact number: 011 807 0913
E-mail: nict@enhanced.co.za

Ulwazi Computer Solutions is a black-owned countrywide computer service and supply company. Together with its sister company Enhance Systems, the company has been supporting a non-governmental organization (NGO) called Project Head, which works in early childhood education in the N4 (Soshanguve) district. It has also started an artisan training programme in computer repair and maintenance for Soshanguve matriculants.

UNIVERSAL SERVICES AGENCY

Name: Tshepo Rantho[13]
Contact Number: 082 886 8561
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The aim of the Universal Services Agency (USA) is to provide universal telecommunications access to the public. In the short term, this has translated into the establishment of thirty telecentre sites for 1997 and 1998. Telecentres are, and will continue to be, positioned in areas with low tele-density and high population. They will be added on to existing community structures and have dial tone and information communication technology available. In the seven sites that will be launched publicly at the end of March 1998, there are five networked workstations, a dedicated Internet line, and six telephones. It is intended that they be run like a village enterprise with users paying for access. The contract established between telecentre managers and the USA states that the cost to the user must be affordable (equivalent to domestic telephone use). Consequently, the profit margin will be subsidized by the Agency.

The Agency has three support projects: a *Computer Project* for the collection and recycling of hardware; a *National Training Programme* for capacity building for telecentre managers; and an *Information Clearing House* for the dissemination of information to Centres and their communities. Of particular interest is a telecentre Management course which has been put together by the Agency and University of the Witwatersrand's Business School. Currently this runs as a five-week full-time course and deals with making the centres sustainable. Technical training in networking, maintenance, and repair of computers is provided, together

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[12] Peté, M. 1998, *Progress Report - First Semester 1998*, Open Learning Centre, Technikon Natal.
[13] Tsepho Rantho is no longer working for USA.

with necessary business management skills. Lefty Monyokolo is the Project Support Manager.

UNIVERSITY OF CAPE TOWN MATHEMATICS AND APPLIED MATHEMATICS DEPARTMENT

Name:	Peter Dunsby
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	Relativity course:
	http://vishnu.mth.uct.ac.za/GR/index.html

Peter is based in the mathematics and applied mathematics department of the University of Cape Town (UCT). He is responsible for the department's home page. He currently runs two online initiatives, a second-year Advanced Calculus Course, and a third-year Relativity Course. Both of these courses have all their administrative and course information online. The online material is an additional resource available to students who attend lectures and tutorials as normal. The calculus online material is a series of multiple choice tutorials, which are completed weekly and marked automatically. Peter will also be involved in getting all material for the UCT Effective Numeracy Course, which is currently paper based, online. Because courses are online, foreign students have been able to take them.

Peter coordinates the departmental web site. He has designed standardized templates for colleague s to use for their web sites. Administrative tools have also been developed. For example, the colloquium advertisements can be easily and automatically updated by filling in new information as prompted. Peter has been assisting staff to use the Internet and would like to encourage a culture of posting course material and research work onto the Worldwide Web. The department has also decided to start an electronic hot seat. In the past, an individual has been physically available in a 'hot-seat' to assist students with any mathematical problems. The electronic hot-seat will enable students to post questions or contact their lecturers at any time. Staff or tutors will be allocated to respond to these queries. Peter thinks that some students are too shy to approach the physical hot-seat, and that the electronic hot seat will provide an alternative way for them to communicate.

UNIVERSITY OF CAPE TOWN MULTIMEDIA EDUCATION GROUP

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fwilson@its.uct.ac.za	
URL:	http://www.uct.ac.za/depts/meg/ and

      http://www.uct.ac.za/depts/meg/dos101s/today.htm

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[14] Harriet Deacon is no longer working at MEG. Marion and Fiona are still involved and MEG is now a part of UCT's Centre for Higher Education and Development.

The Multimedia Education Group (MEG) was formed early in 1996 to work on multimedia resources for the social science departments of UCT. There have been three projects to date: Africa 1300 (an introduction to Archaeology), Deep Foundations (referencing and argument for English and History), and an Online Writing Course for 'English for Academic Purposes'. The unit has three full-time staff, all of whom are subject specialists and who work with the relevant departments on multimedia resources. Deep Foundations has produced four tutorials that make interesting use of interaction in their activities. Questions are answered by typing into a box, text is stored and then generated as a class file which can be viewed by tutors and classmates. This has broken traditional computer-based reliance on multiple choice or binary-type questioning. The cost effectiveness of the project has been analysed as part of an external evaluation, being conducted by Infolit.[15]

UNIVERSITY OF NATAL (DURBAN) BIOLOGY DEPARTMENT

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URL: Multimedia Research Group:
                            http://www.und.ac.za/und/icd/mrgmission.html
Alan's courses: http://www.und.ac.za/und/biology/staff/staff653.html
Alan's research papers: http://www.und.ac.za/und/biology/staff/amory/

Alan works for the Biology Department of the University of Natal (Durban) and focuses his research on the use of multimedia and software for education. His teaching is constructivist and integrates the use of computer technologies into his courses. He supervises a number of students in the Biological Pedagogics Research Unit who are working on multimedia and technology-enhanced learning materials or projects. He is a member of the Multimedia Research Group and has designed and standardized University web page templates.

The Multimedia Research Group
The Multimedia Research Group (MRG) is a group of academics and support staff, interested in the use of multimedia for their teaching and/or for their research. It meets monthly to share ideas and developments. It was formed to 'investigate alternative computer-based teaching methods that could play a role in addressing the educational challenges facing students and academic staff at the University of Natal'.[16] The aims of the group are stated as follows:
- Identification of suitable hardware and software components in order to define standards.
- Development and evaluation of specific multimedia course work with particular learning groups.
- Formulation of short and long term policies.[17]

The group has, in the last few years, developed and implemented multimedia courses for specific departments; presented several papers on multimedia design, development and delivery; and spearheaded the development of an HTML tutor (an online course on HTML) and courseware design software.

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[15] E-mail received from Marion Walton on 27/3/97

[16] Multimedia Research Group Mission, http://www.und.ac.za/und/icd/mrgmission.html, p.1.

[17] *ibid.*

UNIVERSITY OF NATAL (DURBAN) DEPARTMENT OF NURSING

Name: Corinne Jones
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The nursing department offers a problem-based learning degree. Students are expected to work through procedures and techniques in the clinical laboratory at their own pace. Once they are ready to be examined, they can book a master's student or lecturer who will assess them. The resources for learning these procedures are varied, but include videos, real equipment, life size dolls, and multimedia programmes. Corinne designs computer-aided learning multimedia materials for the clinical laboratory.

UNIVERSITY OF NATAL (DURBAN) COMPUTER SERVICES DIVISION

Name: Kathy Murrell
Contact number: 031 260 2478
Email: murrell@cc.und.ac.za
URL:
Kathy's Home Page: http://www.und.ac.za/users/murrell/classrm
Malaria Research Site: http://www.malaria.org.za
Organizational Management Master's Course: http://innerweb.und.ac.za/courses/oms

Kathy has been designing multimedia educational materials for various departments at the University of Natal. She is a part of the Multimedia Research Group and has run courses on web design and web authoring for staff and students. She offers technical support to visually impaired students and to staff starting web-based initiatives.

Description of Video Conferencing System [18]

The University of Natal (Durban, Pietermaritzburg and Medical Centres) does have video conferencing facilities. According to Kathy Murrell, Academic Computing Support, and Jasper Cecil, Head of Durban Audio Visual Centre, the institution does not make use of video conferencing for *distance* teaching, although they confirm that the technology is used for 'cross campus teaching for small groups'.[19]

According to these two representatives, there is some use of video conferencing technologies for education purposes - both examples of which emphasis particular teaching and learning scenarios. Firstly, the Music department teaches small groups on both the Pietermaritzburg and Durban campuses, compressing various sounds across the ISDN lines between the two centres. And secondly, the Medical School, based in Durban, uses the technology for live video relay of operations sent short distances, to for example, learners seated in a lecture

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[18] Extract from: Jackson, C-A. (1998). Appendix One: An Educational Perspective on the use of Conferencing Technologies. In SAIDE. (1998). Evaluation of the Distance Learning Practices of Wits' P&DM Mpumalanga Masters in Management Programme. Johannesburg: SAIDE.

[19] Murrell, K. E-mail correspondence dated 15 September 1998.

theatre, observing the operation from a distance. In this setting, learners are able to interact with the surgeon during a surgical procedure.[20]

It was reported that in general, there is a 'feeling that there is a role for courses with small numbers to hold discussion groups and seminars, but 'chalk and talk' [*sic*] type lectures should not be replicated using this technology.'[21]

In this sense, there appears to be specific type of use of video conferencing technologies with small groups of learners, and in specific learning and teaching dynamics, that falls outside of traditional lecture hall settings. Decisions to use the video conferencing technologies in educational settings therefore appear to be quite successful, although this statement would need to be verified with additional research.

UNIVERSITY OF PRETORIA DEPARTMENT OF EDUCATION

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Johannes runs a course for the Masters in Computer-Aided Learning programme on Using the Internet for Education. This course is offered primarily via the Internet, but includes an intensive four-day face-to-face session. He uses a listserv, chatlines, and e-mail to communicate with his students. His virtual classroom - which has 'desks', a 'blackboard', a 'resource cupboard', and a 'poster wall' - can be visited on the Internet. His methodology is strongly constructivist, with students making most of the contributions through tasks set by Johannes. He works closely with Cheryl Hodgkinson.

UNIVERSITY OF PRETORIA DEPARTMENT OF EDUCATION

Name: Thea de Kock
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Thea de Kock and Johannes Slabbert have been running a research project which aims to develop an effective, comprehensive teacher education model for South African teachers. It is based on the triple-I-continuum teacher education strategy, which involves contact teacher education programmes and distance education support through interactive television technology. In 1997, ten volunteer Higher Diploma in Education (HDE) students teamed up with ten student teachers from Iowa State University to do their practice teaching in the Siyabushwa community in Mpumalanga. The permanent teacher attended an intensive face-to-face workshop at the Siyabushwa Educational Improvement and Development Trust (SEIDET) community centre with Thea and Johannnes. The training was geared towards Curriculum 2005. Learning tasks were designed, to be tried in the teacher's school. This classroom lesson was videotaped and reflected on in the rest of the course. Four fortnightly

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[20] Murrell, K. *op cit.*
[21] Murrell, K. *op cit.*

follow up sessions were held using interactive television. The course for rural teachers is not yet accredited.

UNIVERSITY OF PRETORIA DEPARTMENT OF EDUCATION

Name: Cheryl Hodgkinson
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Cheryl runs a course entitled *Information Technology for Adult Education and Training* in the Masters in Computer-Based Education programme. Her students have an assignment to collect information about three educational projects that are using technology to enhance their programmes. Some the information collected through these assignments has been collated into a database. A strong focus of her course is on the adult learner and on adult learning issues.

UNIVERSITY OF PRETORIA DEPARTMENT OF INFORMATION TECHNOLOGY, NETWORKS AND USER SUPPORT

Name: Mrs Nagel
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This department offers technical support and training to University staff. Most of the training is in office applications, e-mail, and Internet use. There is no emphasis on the integration of IT into the education process. Courses are run for twelve people at a time in a networked laboratory, where there is a projector for the demonstrator's screen. Manuals have been written for each course and contain exercises. There is no accreditation, but a certificate of attendance is given.

UNIVERSITY OF PRETORIA TELEMATIC EDUCATION UNIT

Name: Tom Brown
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Tom is the project manager for the new Telematic Education Unit. There are five different sections making up the unit: Management; Telehelp (client and educator support); Teletuks (interactive teleteaching, video conferencing, infrastructure and virtual campus); Telemedia (courseware design and development); and Teleplan (research and development). Academic departments approach the unit to use technology to enhance the learning environment, mostly 'over a distance'. It is a new University unit and is currently running approximately thirty projects (a project list of telematic education programmes is available).

Telematic's Teletuks unit is responsible for interactive television, videoconferences, learning centres, technical support, and the virtual campus. With regard to Telematic projects, a project team, composed of members from each section of Telematic Education, academic personnel from the department concerned, and role players from university units involved in specific project, is formed. Projects range from simply making a transparency (a micro-project) to designing a full academic programme to be delivered through telematic education strategies (a macro-project). Most of projects are paper-based, 'distance education' programmes with sporadic contact sessions. Some use interactive television broadcasts as support, and a few are web-based (although the demand for web-based instruction is growing daily). A virtual campus will be operational from January 1999.

DESCRIPTION OF THE VIDEO CONFERENCING SYSTEM[22]

According to Dr Tom Brown, Project Manager of Telematic Education at the University of Pretoria, the institution does use video conferencing.[23] The person responsible for Interactive Television and video conferencing is Almero du Pisani. According to du Pisani, the institution has used a PictureTel 4200 system for the past two years. The nature of that use involves mostly, two-way audio and video meetings (approximately fifteen per year) between South Africa and the USA, Europe and the East. According to du Pisani, the majority of universities with which the institution is connected are also using PictureTel. The system is installed in the institution's main broadcast studio, which enables it to 'use a good lecturer at any other university and broadcast his/her lecture via our DSTV satellite channel all over [South Africa].'[24] This happened about three times during the past two years.

It was also reported that the Management School intends using PictureTel for its MBA programme from 1999 to support learners in Nelspruit and Pietersburg. Within the last month, the institution purchased a Live 200 and a Swift Site system, which will be used as a portable system for classrooms and offices.

Observations and Comments

According to the institution's representatives, the only problem with any video conferencing system is that an ISDN line is needed at every venue. Unfortunately, only major cities have digital Telkom exchanges, which means that at present this technology cannot be used in rural areas. The cost of a bridge (for multi-point conferences) is also very expensive, and the institution reports that 'we rather rent TSA's or Wits Tech's'.[25]

According to the Telematics Education Unit, there is an aim to encourage 'flexible learning'. It uses 'telematic education' as 'an umbrella terminology that is used to describe mixed or multi mode of education including all distance education modes and sporadic contact sessions, as well as combinations there of'.[26] In the Unit's definitions, flexible learning is, in

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[22] Extract from: Jackson, C-A. (1998). Appendix One: An Educational Perspective on the use of Conferencing Technologies. In SAIDE. (1998). Evaluation of the Distance Learning Practices of Wits' P&DM Mpumalanga Masters in Management Programme. Johannesburg: SAIDE.

[23] Brown, Tom H. Dr. E-mail correspondence dated 15 September 1998.

[24] Du Pisani, A. E-mail correspondence dated 15 September 1998.

[25] Du Pisani, A. *op cit.*

[26] In e-mail sent on the 12 March 1998, Dr Tom Brown included the following description of Telematic Education: 'Wat is Telematiese Onderwys? Telematiese Onderwys verwys na `n omvattende stelsel van veelsydige studentgesentreerde onderrig-leeromgewings wat met behulp van veelsydige leweringsisteme

essence, a philosophy of education that refers to a learner-centred approach to teaching and learning which allows flexibility in terms of:

- ➢ entry and exit to learning programs
- ➢ modes of teaching and learning
- ➢ program components
- ➢ evaluation methods
- ➢ choice regarding time, place and pace of learning
- ➢ and many more[27]

Telematic teaching and learning models are described as almost synonymous with flexible learning: 'It is, however, a term that emphasizes the use of technology (telematics) to enhance the teaching and learning environment, mostly "over a distance"'.[28] In this usage, paper materials are included within the broader concept of 'technology'; and 'telematic' as an umbrella term used to describe all electronic communication technologies.

UNIVERSITY OF PRETORIA TELEMATIC EDUCATION: TELEMATIC FACILITIES (VIDEO AND BROADCASTING)

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Dr Freysen is part of the Telematic facilities section of the Telematic Education Unit. He deals with video production and broadcasting. University Departments approach him with specific requests for the production of video clips to support face-to-face teaching or for broadcasting to satellite campuses. Together, they usually make programmes of about ten minutes and, on average, this costs R5 000. They aim to avoid 'talking heads' and mostly film demonstrations of procedures. Last year, about eighty videos and 2 500 duplications were made (interestingly, about 1500 of the duplications were requests for a copy of what something that had been broadcast). Broadcast programmes are also frequently recorded off air.

UNIVERSITY OF SOUTH AFRICA COMPUTER SCIENCE DEPARTMENT

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Students enrolled in computer science with the University of South Africa (UNISA) are required to have access to a 486 computer, but do not require Internet access. This severely

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(flexible learning systems) daargestel word. Hierdie veelsydige leweringsisteme sluit die totale spektrum van onderwysmodi in, vanaf kontak- tot papiergebaseerde tot webgebaseerde afstandsonderwys. Dit sluit dus ook ondersteuningsmodi soos interaktiewe televisie-onderrig en interaktiewe multimediapakette in'.

[27] Internal document - transparency from a speech about the unit, collected from Tom Brown on the 27/01/98
[28] *ibid.*

affects the use of Internet for courses. Besides a networked laboratory of fifty computers in Pretoria, where one machine has Internet access, there is no infrastructure in place for UNISA students to get access to the Internet. At present, there are web pages for each computer science module offered, and individual lecturers can enhance these. Newsgroups and e-mail allow for learner-lecturer and learner-learner communication. Some tutorial matter (which is paper based) has been converted to HTML for inclusion in some sites. People present at this interview raised concerns about the use of the Internet as a teaching technology, particularly because of problems of access. They questioned whether the use of Internet or of computer-based resources would really add to the learning process.

UNIVERSITY OF SOUTH AFRICA (UNISA) STUDENTS ONLINE

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Students Online is an experimental UNISA initiative. It aims to enable students to do their administration online, to complete some courses using the web, and to receive some counselling and support facilities. Currently, students can have e-mail contact with lecturers and participate in discussion forums with fellow students. They have access to online course information, assignment results and credits, examination results, and search facilities for the library. Affordable Internet access is the biggest problem for the continuation of this project. It is hoped that the 'Cyber Connections Initiative' will neutralize that concern.

UNIVERSITY OF THE WESTERN CAPE BIOLOGY DEPARTMENT

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Derek has been involved in two Internet projects at the University of the Western Cape (UWC). The BioEd Project aims to make the knowledge base of the University Botany Department available to teachers and students of biology. An electronic standard eight (grade ten) textbook has been developed, which has links to related sites. Chat rooms and discussion groups have been set up, but are not yet being used. Most people visiting the site are not South African. Bandwidth problems and the limited number of schools with Internet connections are seen as major barriers to use of the site. The second project is a Multimedia Project, which aims to develop material to be used by UWC students in their Botany courses. An experimental web site has been designed to support a third year Botany course. An Asynchronic Transfer Mode (ATM) network has been installed to overcome bandwidth and daytime congestion problems.

WESTERN CAPE EDUCATION DEPARTMENT: CAPE TOWN TEACHERS' CENTRE

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Louis and Goolam run in-service teacher training workshops on the use of technologies in schools. They also provide an advisory service for schools looking to start a computer centre or wanting to introduce computers. The teachers' centre has a twelve-node computer laboratory, which has twelve networked computers and a dedicated Internet connection. Goolam is also involved in two specific projects. He has worked with the Cape Technikon to produce a course on IT training for teachers, which is linked to getting schools resourced. If a teacher successfully completes a project using IT, with their class, they are then linked to funding to get better equipment into their school to continue to use the technology. In addition, he works on 'Dialogues', a pilot project being run in conjunction with the Art Advisors. It is an Internet-based project, where students do research into their culture and identity and publish this on the Internet. It is done in collaboration with European students who are completing the same project. The Cape Town Teachers' Centre (CTTC) offers assistance to both students and teachers in this process.

WESTERN CAPE EDUCATION DEPARTMENT: EDUCATION TECHNOLOGY UNIT

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The Educational Technology Unit has two sections: *Information Technology*, which handles computers in education; and *Media* which handles all other audio-visual equipment and materials. The operation of the unit is severely constrained by lack of funds. The unit aims to have one Pentium computer with a modem in every school, as this would enable it to have immediate contact with all schools in the province for both administrative and educational purposes. Ideally, schools would also have local call, dial-up access to the Internet, as the Unit feels that the Internet could be a very powerful technology that could support both the Unit and subject advisors. It is felt that local web-based resources need to be created for use by teachers in classrooms. The Media section has a production unit that makes educational video, audio, and print materials. There are plans to investigate broadcasting educational materials, focused primarily on students, using a community radio station. Broadcast technology has the advantage of reaching remote areas, but is severely restricted by its lack of interactivity and by having to be used in real time. Broadcast materials could be used to supplement classes, but teachers need to have viewed the material beforehand and to have built a lesson, using the broadcast material (or parts thereof) as one resource in the lesson.

WESTERN CAPE EDUCATION DEPARTMENT PAROW TEACHERS' CENTRE

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The Parow Teachers' Centre offers advice in setting up IT centres at schools and runs afternoon workshops on the educational use of computers and their applications (including the Internet). The major focus is on making teachers and principals, particularly those from under-resourced schools, aware of existing information and communications technologies. For example, there is a worrying trend in those schools that have some equipment to reserve the use of these machines for those students who pay a levy every term (of between R15 and R20). Access for teachers from disadvantaged areas is another issue of concern.

WESTERN CAPE SCHOOLS' NETWORK

Name:	Stephen Marquard
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Stephen has involved himself in the connectivity of schools in the Western Cape. He is therefore integrally involved in the Western Cape Schools Network (WCSN) and in SchoolNet SA. Through various sponsorships and project initiatives, 180 schools in the Western Cape have Internet access. It is estimated that 200 schools have Internet access, mostly through their own initiative. Ten to fifteen schools have become connected through sponsorships and connectivity initiatives. It is estimated that half of these ten to fifteen schools are using their Internet connection. The primary problem is seen to be staff and poor management - staff members are not equipped to make use of the new provision. In some cases poor management (such as not paying telephone bills) has meant that the connection was ineffective.

WINCHESTER RIDGE PRIMARY SCHOOL

Name:	Brian Harris
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Brian has just recently come to Winchester Ridge Primary School as the acting principal. He has started a small business, through which he advises the surrounding schools on setting up an IT infrastructure (free of charge) and then sells them hardware, installs and networks computers, and provides ongoing technical support. Winchester Ridge has a computer laboratory that is not yet fully networked and mainly has 386 and 486 machines. It is used primarily for mathematics and English drill programmes and to some extent for Office Applications for assignments. The room is booked for use by class teachers. The library has a

Pentium computer with CD-ROM, the administration is computerized with a dial-up Internet facility. Administration machines are also available for staff use. Winchester primary regards itself as a realistic example of what could be possible in schools that have limited resources.

WITS P&DM COURSE[29]

The Mpumalanga Master of Management is one of the programmes of the Graduate School of Public and Development Management (P&DM) at Wits. The Mpumalanga Management Programme (MMP) was initiated and established under the auspices of the Mpumalanga Provincial Government (MPG) and the Graduate School of Public and Development Management (P&DM). The initiative also has the funding support of the private sector, notably Gencor, now Billiton, and Liberty Life The establishment of the MMP initiative follows a significant demand for public and development management training in the local setting.

The objective of the MMP is not to develop a satellite campus but to extend its existing academic programmes to Mpumalanga via distance education for a five year period so as to provide management capacity building, training and technical assistance in the region during a period when indigenous institutions are establishing and building more permanent capacities.[30]

Following the debate on an envisaged University in Mpumalanga, the MMP has been established to support both the university initiative in the short to medium term as well as to respond to immediate demands for training in the Province. The MMP presents both the Master of Management as well as specific certificate courses. In addition, the MMP became involved in other initiatives such as a partnership with the University of Alberta (Canada) to present a project leaders' course (funded by CIDA) and the Maputo Corridor and will also develop an analytical capacity to support the province with its technical assistance endeavours. The MMP with all its sub-projects went into operation on 1 June 1997, with appointment of a full-time senior academic based in Nelspruit and the setting up of local facilities.

The main teaching and learning strategies in the programme are lecture sessions (some delivered via PictureTel videoconferencing technology), course packs, learning groups, and assessment by means of individual and group assignments and tests, and formal examinations at the end of each block. These strategies are complemented by locally based tutoring (compulsory courses, electives and research reports), workplace observation from the second year and self-managed learning groups.

In the last six months of the course, students are expected to complete a research report in which they apply analytical and applied research techniques to the topic chosen from their area of specialization. Students are assigned advisors who supervise and guide the formulation, preparation and completion of the research report.

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[29] SAIDE (1998) *The Distance Education Practices of the Wits P&DM master of management programme in Mpumalanga: Evaluation.* SAIDE: Johannesburg.
[30] de Coning, C. (1998). *Annual Progress and Status Report of the Mpumalanga Management Programme (MMP) June 97 to May 98.* Nelspruit: MMP.